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ENERGY EFFICIENCY

in California's Public Power Sector

A 2013 Status Report

This report is dedicated to the
3.2 million customers
served by public power
throughout the state.

ACKNOWLEDGEMENTS

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I. EXECUTIVE SUMMARY

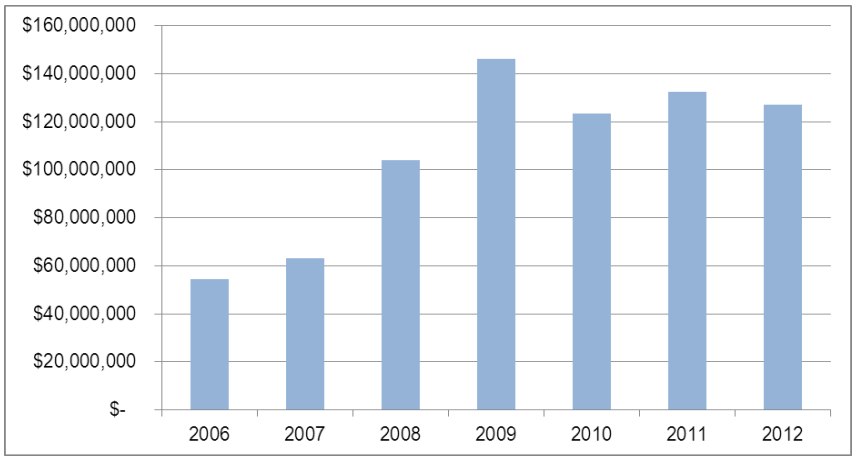
The California Municipal Utilities Association (CMUA), in collaboration with the Northern California Power Agency (NCPA) and the Southern California Public Power Authority (SCPPA), are pleased to submit this report, *Energy Efficiency in California's Public Power Sector: A 2013 Status Update.*

California Senate Bill 1037 (Kehoe, 2005) established several important policies regarding energy efficiency, including a statewide commitment to cost-effective, reliable, and feasible energy efficiency, with the expectation that all utilities consider energy efficiency before investing in other resources to meet growing demand. Assembly Bill 2021 (Levine, 2006) added to these policies by requiring the establishment of 10-year energy savings targets on a triennial basis. Assembly Bill 2227 (Bradford, 2012) amended the requirement to a quadrennial basis. Public power supports these policies and partners with state agencies and the environmental community to aggressively pursue all cost-effective energy efficiency.

CMUA, NCPA, and SCPPA have been working collaboratively since October 2005 to measure energy efficiency program effectiveness and report program 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 seventh report takes into consideration the latest available developments regarding public power's wide range of energy efficiency programs.

The POU'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 that are served. Even with this commitment, energy efficiency program expenditures for each utility can vary dramatically from year-to-year, depending upon the customer base of the individual utility, the climate zone in which the utility is located, physical size of the service territory, customer desires to invest in energy efficiency, and economic conditions. Despite these challenges, public power energy efficiency investments have remained very strong surpassing $120 million annually since 2009, as Chart ES-1 depicts below.

Chart ES-1. Total Program Expenditures, 2006-2012



SB 1037 – Energy Efficiency Program Results

The principal findings and conclusions of this analysis for FY11/12 are as follows:

- **Significant Investment:** POUs spent nearly $127 million on energy efficiency programs, and this is the fifth consecutive year the $100 million threshold has been exceeded. Since 2006, POUs have invested over $750 million in energy efficiency programs.

- **Peak Demand Reduction:** Public power programs reduced peak demand by more than 82.5 megawatts. Since 2006, POUs have reduced peak demand by over 563 megawatts.

- **Energy Savings:** Net annual savings totaled over 439,700,000 kilowatt-hours (kWh). Since 2006, POUs achieved over 2.89 billion kWh in savings through energy efficiency programs.

Chart ES-2. Summary of Programs, 2006-2012

2006-2012 Publicly-Owned Utility Program Results				
Year	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle MWH Savings	Total Utility Cost ($)
FY05/06	52,552	169,302,601	2,249,214	$ 54,412,728
FY06/07	56,772	254,331,659	3,062,361	$ 63,151,647
FY07/08	82,730	401,919,205	4,473,801	$ 103,907,266
FY08/09	117,435	644,260,232	6,749,912	$ 146,093,107
FY09/10	93,712	522,928,998	5,586,299	$ 123,433,250
FY10/11	81,121	459,458,539	4,604,364	$ 132,372,795
FY11/12	82,561	439,710,369	4,638,521	$ 126,936,631
TOTAL	**566,883**	**2,891,911,603**	**31,364,473**	**$ 750,307,425**

- **Cost-Effectiveness:** Applying the Total Resource Cost (TRC) societal test, the principal measure used in the industry to determine whether programs are cost-effective, the aggregated TRCs for public power equals 2.66 in FY11/12, meaning public power energy efficiency programs produce over two and a half dollars in societal benefits for every dollar spent.

- **Most Savings:** Lighting continues to dominate public power energy efficiency programs, accounting for almost half of the total energy savings achieved (48%).

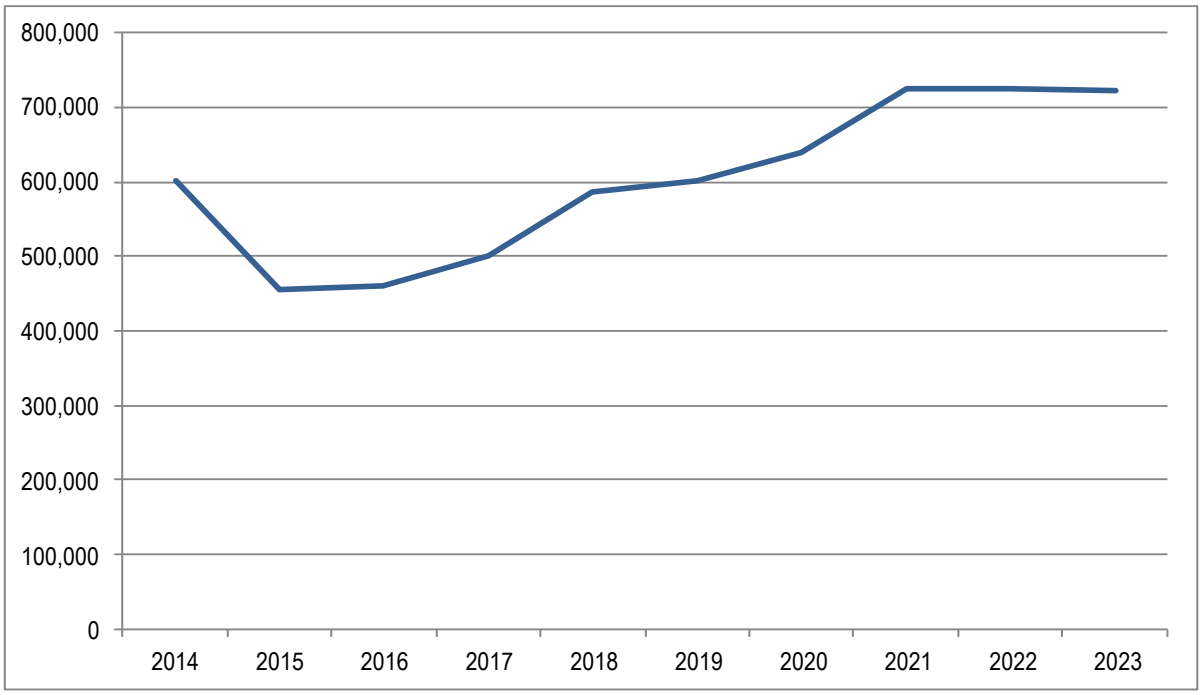
- **Efficacy of Programs:** The average cost per kWh saved from all POU programs is $0.29/kWh. However, this total does not capture the full electricity savings over the lifetime of different measures. The cost per kWh saved over the lifetime of energy efficiency measures is estimated at less than 3 cents per kwh ($0.027/kWh).

AB 2021 – Updated 10-Year Energy Savings Targets

The following are key highlights of public power's updated energy efficiency targets:

- **Forecasted Energy Savings:** Averaging over 600,000 MWh in energy savings annually, the recently adopted targets represent an ongoing and continued commitment from public power to achieving additional energy efficiency in their service territories.

Chart ES-3. Annual Energy Savings Targets, 2014-2023



- **Societal Benefits**: The CEC estimates the average per capita electricity consumption in California is 6,721 kWh per year. To put that in context, the energy savings targets estimate that public power programs will save the same amount of energy as is consumed by approximately 90,000 people annually, translating into lower energy bills for customers, reducing the need to construct new power plants, and decreasing the state's carbon footprint.

- **Comparison to 2010 Targets:** Cumulative POU targets for the next ten years are three percent below the targets adopted three years ago. Two factors explain this decline. First, the new targets reflect the tail end of a severe economic downturn, which was not fully accounted for when the targets were adopted in 2010. Also, the updated targets account for new benchmark appliance standards which by definition produce less energy savings compared to older versions. Even with the decline in aggregate, 15 public power utilities increased their savings target in the 2013 version.

II. INTRODUCTION

Legislative & Statutory Requirements

Various pieces of legislation govern the compilation of this report. Senate Bill 1037 (Kehoe, 2005), requires electrical utilities, POUs, and the California Public Utilities Commission (CPUC) to make energy efficiency programs a priority before acquiring other sources of electricity or building new transmission lines. In particular, the bill requires POUs to annually report to its customers and to the CEC its investments in energy efficiency and demand reduction programs.

Assembly Bill 2021 (Levine, 2006) directs the CEC every three years, in consultation with CPUC and POUs, to identify all potentially achievable cost-effective, reliable, and feasible electricity and natural gas efficiency savings and establish 10-year statewide energy efficiency savings targets. Among other things, the bill also directed POUs to contract for independent evaluation, measurement, and verification (EM&V) of the energy efficiency savings achieved by the municipal utility programs.

Assembly Bill 2227 (Bradford, 2012) recast and revised a number of reporting requirements applicable to POUs, including some related to energy efficiency. To that end, AB 2227 changed the frequency of the energy efficiency 10-year target setting requirements from once every three years to once every four years.

Pursuant to these three pieces of legislation, the report is provided to the CEC in compliance with Section 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

Forty utilities are detailing their energy efficiency activities in this document, programs which cover approximately 25 percent of customer electric load served in California. Beyond the informational requirements described in the abovementioned statute for each utility, 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 III offers a numerical summary of energy efficiency savings stemming from current POU energy efficiency programs. The chapter shares important perspectives about continuing economic uncertainties and how those uncertainties impact customer behavior. This chapter also highlights the range of public power energy efficiency programs that are currently available to customers. Included in this discussion is a snapshot of utility best practices and multi-utility collaboration efforts. Additional descriptions of individual utility programs can be found in Appendix A.

Chapter IV provides a brief technical description of the methodologies used by the public power community to report energy savings and measure savings. Specific attention is given to evaluation, measurement and verification (EM&V) activities, and the work currently being undertaken with the staff of the CEC to develop consistent EM&V protocols going forward. Previous reports have provided extensive documentation regarding the energy efficiency reporting tools that are utilized to evaluate utility programs and should be relied upon if additional technical information is needed beyond the level of detail provided in Chapter IV. A list of all available EM&V reports, including a hyperlink to the report, can be found in Appendix B.

Chapter V provides a summary of the updated 10-year energy efficiency targets adopted by POUs, including a detailed description of the Navigant modeling tool used to help utilities develop the new targets. Additional utility-specific data regarding the 10-year targets is included in Appendix C.

Chapter VI synthesizes the collective experience and expertise of public power into recommendations for how to achieve additional energy savings in the future. With technological innovations, increased consumer education, and program maturation public power's investments in energy efficiency necessarily

have to evolve. This chapter identifies potential opportunities and likely barriers to be considered, both by policymakers and POUs, regarding future energy efficiency efforts.

Appendix A is a compendium of individual POU data and includes a narrative description of each utility and their energy efficiency programs, as well an itemized summary of energy savings and utility investments by program.

Appendix B contains a comprehensive list of current and historical POU EM&V reports, as well as the web addresses where the full reports can be downloaded.

Appendix C contains an in-depth description of the assumptions and factors that are built into the EERAM tool used by POUs in developing updated 10-year energy efficiency targets. The contents of this appendix were prepared by Navigant.

Appendix D details the different scenarios generated by the Energy Efficiency Resource Assessment Model (EERAM) tool specifically developed by Navigant to support utility target-setting efforts. This section also notes each utility's individual 10-year targets for FY2014-2023

Appendix E is a list of references utilized in the compilation of this report.

III. Overview of Energy Efficiency and Public Power

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 resource stewardship, 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, generation, transmission, distribution, and demand. Public power commitments to energy efficiency are guided by four important concepts:

- **Social and Environmental Responsibility**: POUs place a high priority on energy efficiency, investments in renewable power supplies, low-income programs, and economic development. Local elected officials govern and regulate public power to ensure direct accountability on these important issues to customers.
- **Operational Efficiency**: Public power has important efficiency programs to reduce and/or shift peak demand that optimize power generation, transmission, and ensure more efficienct 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.

Public power commitments to 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 specifically tailor programs to meet the 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.

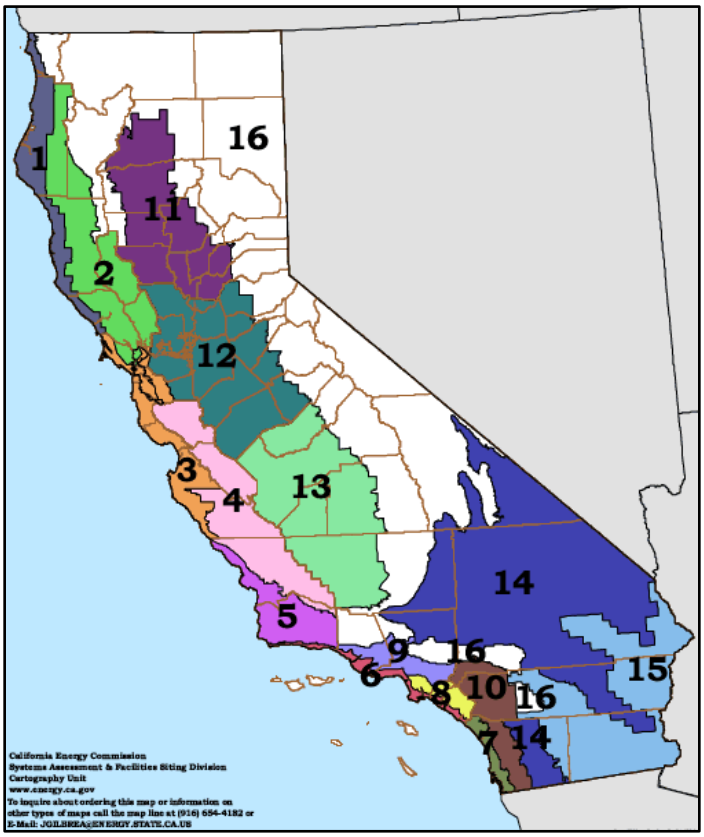
Diversity with a Common Objective

POUs are diverse, and that diversity is reflected in differing programs tailored to the needs of local constituents, taking into consideration key factors, including climate zone, customer classes, and local economic conditions. Common to all is the desire to spend energy efficiency dollars wisely and utilize the benefits of local decision-making to create programs that are effective, innovative and forward-thinking.

Differing Climate Zones

Location, location, location. This famous axiom regarding the "three things that matter most in property" is equally relevant when discussing what makes the Golden State's POUs unique.

Figure 1. California's 16 Climate Zones



Source: California Energy Commission

For energy policy purposes, California is divided into 16 separate and distinct climate zones, which allows state policymakers to recognize the diversity of the state's population. This diversity extends into the evaluation of utility approaches to energy efficiency program deployment. 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.

The climate zone in which the building is located is one of the primary assumptions driving differences in estimated energy savings related to specific types of energy efficiency measures across different utilities.

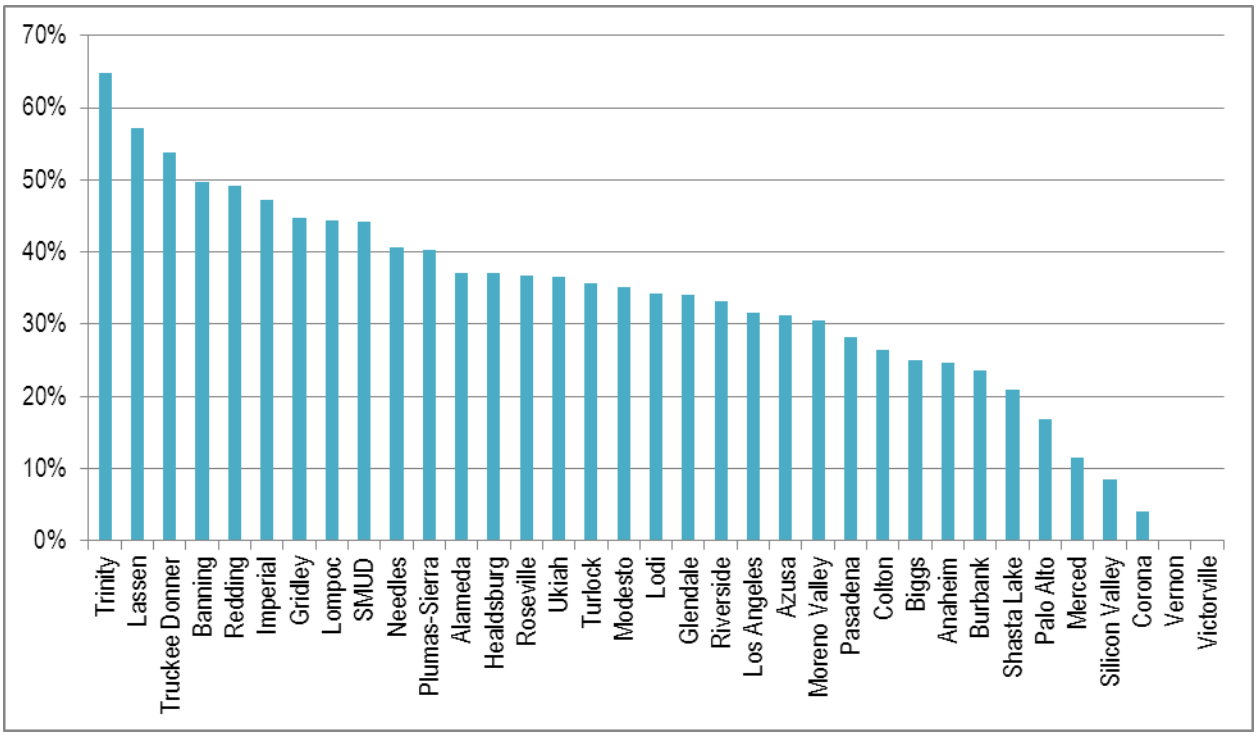
HVAC savings provides an excellent example of diversity across climate zones. An HVAC installed in the City of Redding (Climate Zone 11), with very hot summers that require a high utilization of air conditioner usage, yields considerably greater savings than that same unit would produce in a coastal community like Lompoc (Climate Zone 5) which lacks a significant air conditioning load. In essence, what makes for an excellent energy efficiency investment in one utility service territory may not necessarily add up to one in another. With such a wide

geographic footprint, public power utilities tailor their programs that recognize the importance of unique programs that best serve the needs of their local communities.

Different Types of Customers

Customer class profiles also vary significantly from utility to utility, which impacts the POU planning and program design efforts. In some POU communities such as Vernon, Corona, and Silicon Valley Power, retail sales is dominated by the commercial and industrial customers. In contrast, residential customers in other POUs, such as Trinity, Lassen, and Truckee Donner represent well over 50 percent of their respective utility's total retail sales. Chart 1 below illustrates that the share of retail sales attributable to residential customers across the POUs varies considerably, highlighting the importance of customizing programs at the local level.

Chart 1. Residential Retail Sales as Percent of Total Retail Sales, 2011.



Source: US Energy Information Administration

Even among utilities with similar customer class configurations, differences can be seen. For example, Moreno Valley is a relatively new POU having started serving customers in 2004, and all of the customer facilities it serves are nine years old or newer, closely tied to current Title 24 Standards. By comparison, Lodi, Alameda, Modesto, and others have been providing service for more than 100 years, with a residential housing stock that is significantly older with different energy efficiency needs.

Clearly, the success of POU energy efficiency programs is closely related to understanding the specific needs of individual customers within their respective service territories. Truckee Donner has one of the more unique customer profiles and load shapes in California. The vast majority of residential customers use their residences as a second home. This results in an atypical peak load for Truckee Donner between Christmas and New Year's Eve and on weekends. Glendale, which operates both a water and electric utility, closely aligns its energy efficiency programs with water conservation, administering Smart Home Energy and Water Saving Surveys which reduce customer energy consumption through comprehensive in-home energy and water saving surveys, education, and direct measures installations. Public power offers a variety of innovative programs to serve a variety of different customers (see **Appendix A** for further information**)**.

Overall Size of the Utility

POUs vary a great deal in size, which impacts the range of energy efficiency programs that are offered. At the larger end of the spectrum are the Los Angeles Department of Water and Power (LADWP), Sacramento Municipal Utility District (SMUD), and Imperial Irrigation District (IID). On the other end are dozens of POUs serving much smaller communities, including but not limited to the cities of Needles, Gridley and Biggs.

LADWP and SMUD together represent over half of the total retail electricity sales from public power (55.7%). The ten largest POUs account for the lion's share of sales (84.4%). Conversely, the ten smallest POUs are a little over one percent of total retail sales from public power (1.2%). As large as LADWP and SMUD are compared to other POUs, combined they are a roughly one-fifth the size of the two largest investor-owned utilities (IOUs), Pacific Gas & Electric and Southern California Edison.

Program support activities, including EM&V by independent third parties, can be easier for the larger utilities to manage than smaller utilities with limited resources. Even with these limitations, the collaborative nature of the public power community allows for the development and sharing of best practices among utilities, which could apply to EM&V analyses. A successful program in one utility can be replicated in other utilities with similar customer needs. Likewise, EM&V work completed for one utility can inform the decision-making of other utilities regarding whether to move forward with a program or vendor. For more on POUs EM&V activities, see **Chapter IV**.

Local Economic Factors

The state of the local economy also impacts the ability of utilities to deploy energy efficiency programs, and despite experiencing one of the worst economic recessions in decades, public power utility programs are continuing to offer a comprehensive range of programs. As previous reports have shown, energy efficiency expenditures have been strong in recent years. As we review 2012, California's economy finally began to show some signs of improvement. Still, California's statewide unemployment rate in December 2012 was

9.8 percent, nearly two percentage points higher than the national unemployment rate, which has held steady around 7.9 percent since September 2012.[1]

In general, the communities that public power utilities serve have seen a modest improvement in their unemployment rates, consistent with the statewide trend. However, the majority of POU communities are located in areas with higher unemployment rates compared to the state as a whole, with many exhibiting unemployment rates above 10% and seven above 15% (see Table 1).

Table 1. POU Communities Unemployment, December 2012

Utility	December	Utility	December
Gridley	26.2%	Redding	10.5%
Imperial	25.5%	SMUD	9.9%
Merced	17.2%	CALIFORNIA	9.8%
Shasta Lake	16.3%		
Biggs	15.5%	Ukiah	9.5%
Lompoc	15.5%	Glendale	8.9%
Trinity	15.1%	Healdsburg	8.8%
Plumas-Sierra	14.9%	Anaheim	8.7%
Victorville	13.0%	Roseville	8.7%
Modesto	13.0%	Burbank	8.3%
Moreno Valley	12.8%	Needles	8.2%
Banning	12.7%	Corona	8.1%
Port of Oakland	12.5%	Pasadena	7.8%
Lassen	12.2%	Truckee Donner	7.3%
Colton	11.7%	Rancho Cucamonga	7.0%
Pittsburg Power*	11.5%	Silicon Valley	6.8%
Turlock	11.4%	San Francisco PUC	6.5%
Los Angeles	11.3%	Hercules	5.8%
Riverside	11.2%	Alameda	5.6%
Azusa	11.1%	Palo Alto	4.0%
Lodi	11.0%	Vernon	0.0%

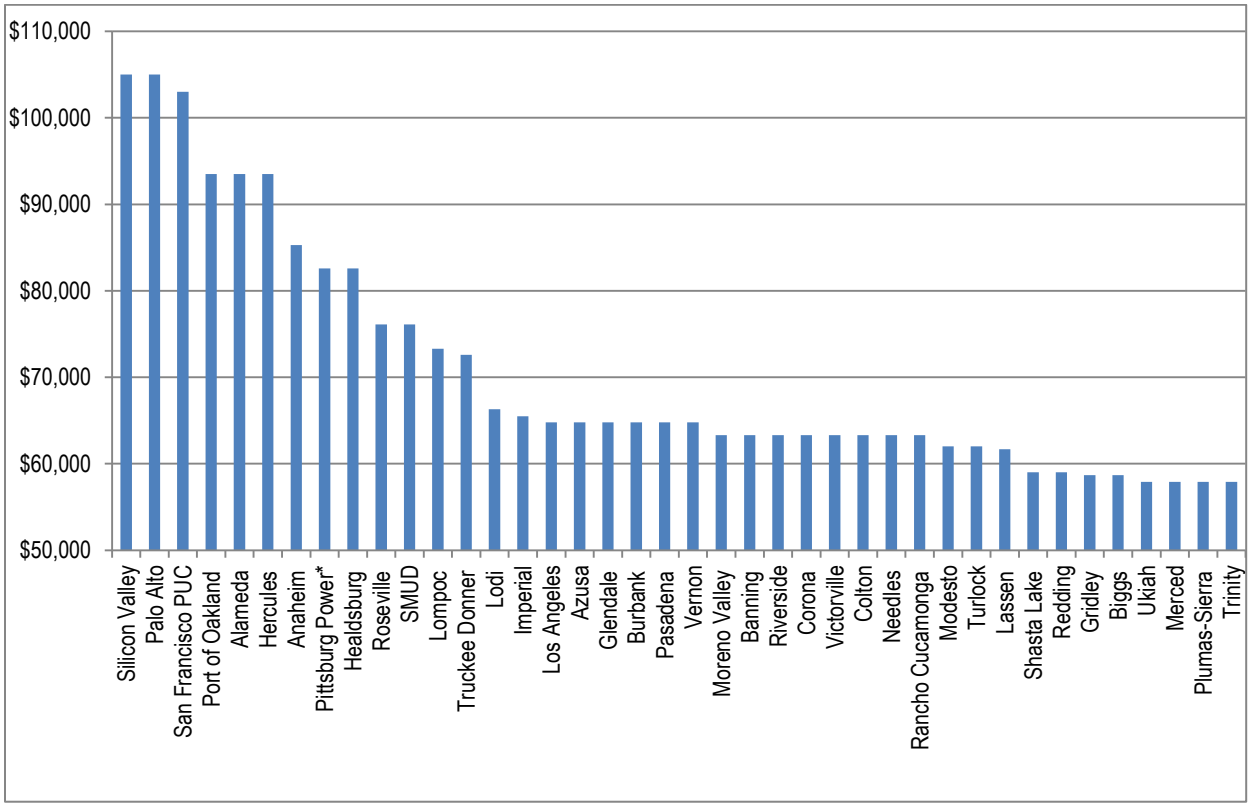
Source: California Employment Development Department
****Unemployment rate for Pittsburg is the City of Vallejo in Solano County***

Another useful measure of local economies and the desire to invest in energy efficiency is the area median income, developed by the California Department Housing and Community Development. As is the pattern with unemployment rates, the median income in POU communities varies significantly. Utilities operating in

[1] United States Department of Labor, Bureau of Labor Statistics. *The Employment Situation – January 2013.*

the Bay Area have the highest median income, reflecting the very high cost of living in the region. On the other end of the scale are the more rural counties of the Central Valley and the High Sierras, as well as urban pockets in the Greater Los Angeles Area, with some areas reporting median incomes that are half the levels reported in the Bay Area.

Chart 2. Median Income for POU Counties, December 2012.

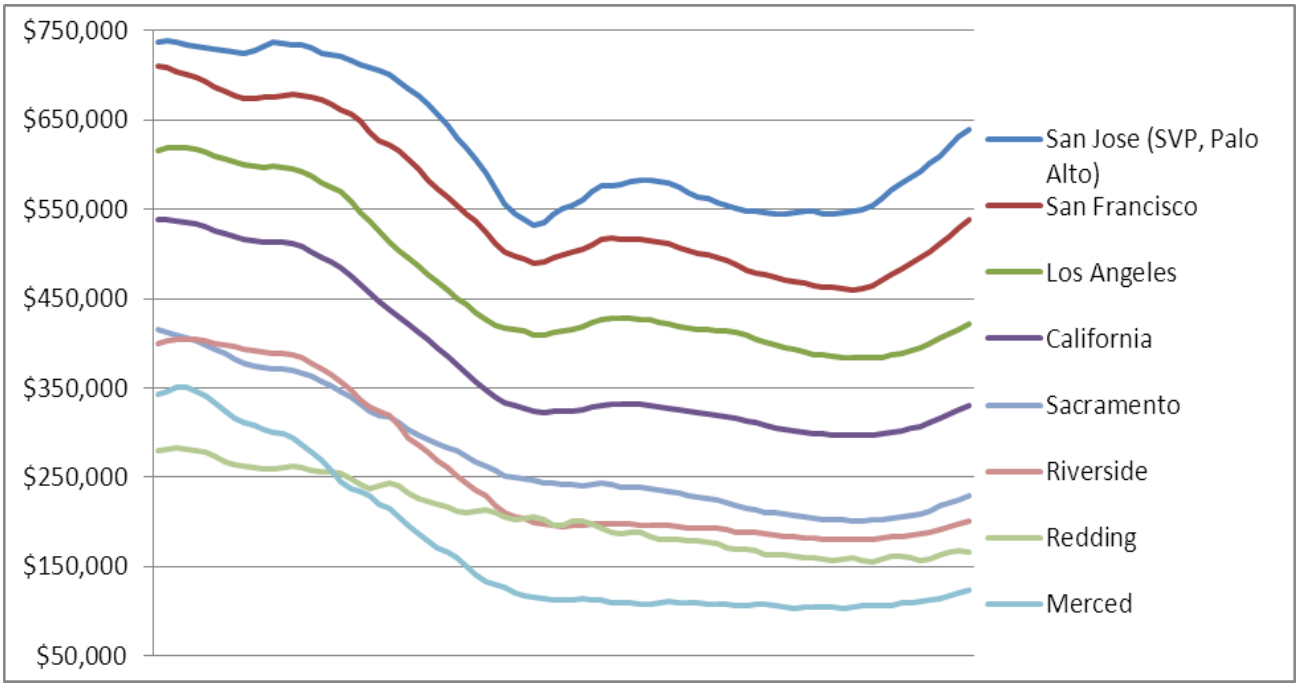


Source: California Department of Housing and Community Development

Further complicating potential investments in residential energy efficiency is a California housing market that has been crippled by the prolonged economic downturn. According to Zillow[2], the statewide median home value in December 2012 was $325,000, nearly 40 percent less than the statewide median in December 2006 when the California real estate market peaked. Chart 3 depicts the peaks and valleys of the California housing market in select areas since December 2006, with the market finally showing signs of recovery at the end of the 2012 reporting cycle.

[2] Zillow is a home and real estate marketplace with a database of more than 110 million U.S. homes that includes homes for sale, homes for rent, Zestimate® home values , Rent Zestimates and other information..

Chart 3. Median Home Values in Select California Metro Areas, December 2006-January 2013.



Source: Zillow Home Value Index

As the charts and tables suggest, there are signs of economic recovery in regions, especially along the coast. The Bay Area and Silicon Valley economies in particular are performing better than other areas. The economic vitality helps empower some of these communities to adopt more ambitious clean energy programs, and invest in energy efficiency.

Other regions have clearly not fared as well. The Central Valley, the High Sierra, and the southeastern desert continue to struggle from the impacts of the recession. Struggling local economies adversely impact the ability of customers to participate in utility energy efficiency programs. For many it is simply a lack of disposable income. Customers with a lack of disposable income are often precluded from making energy efficiency investments which require upfront capital, even if the investment would produce energy savings that would pay for itself in a short timeframe. POU customers who have experienced dramatic decreases in equity may be less inclined to purchase new appliances or be able to secure another loan or mortgage to finance an energy efficiency retrofit, regardless of the payback period.

Customer participation in utility energy efficiency programs in communities with high unemployment and low median income can be especially challenging.

Modeling & Compiling Program Data

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 energy efficiency programs are interpreted and measured.

As a practical matter, energy savings attributable to utility energy efficiency programs is 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.

The Database for Energy Efficient Resources (DEER) is a CEC and California Public Utilities Commission (CPUC) sponsored database designed to provide well-documented 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.

Since SB1037 was passed in 2005, public power has significantly invested in the development of tools and resources for POUs to use when reporting and verifying the results of their energy efficiency programs. KEMA, Incorporated (KEMA) and Energy and Environmental Economics (E3) have provided public power with their considerable expertise in this effort. These tools resources were developed to allow all California POUs participating in this collaborative report to measure energy efficiency program effectiveness and report program savings in a consistent and comprehensive manner.

The E3 Reporting Tool is a sophisticated Excel spreadsheet model used to report the results of utility energy efficiency programs that was originally developed for the CPUC's review of IOU energy efficiency programs. The model has been enhanced and updated to perform this same function for POU's energy efficiency programs. The model contains a database of over 5,000 energy savings measures. The measure database included in the Reporting Tool was updated based on the final 2009 KEMA Measure Quantification Report. Utility incentives paid to free-riders are added as a cost in the TRC test, consistent with the CPUC methodology adopted for investor owned utilities.

For the 2011 reporting cycle, the avoided costs were updated to reflect CPUC avoided costs adopted in the fall of 2011. Updated DEER load shapes for Air Conditioning measures were also added. Finally, updated DEER Net-to-Gross (NTG) values were included and applied to each measure included in the database.

These updates have reduced the TRC ratios reported by municipal utilities in years past, in some cases significantly. The key factors leading to reduced TRC ratios are:

1. **Lower natural gas prices.** Each CPUC avoided cost update since 2008 has resulted in lower energy values primarily as a result of lower natural gas price forecasts.

2. **More "peaky" energy price shapes.** The energy price shapes used in the CPUC avoided cost methodology are based on CAISO MRTU energy prices, as opposed to the PX price shapes used previously. Additionally, a separate allocation of capacity value was also added. Both these changes made the avoided cost energy prices higher in on-peak periods and lower in off-peak periods. This increases the value for AC measures but decreases the value for lighting measures, which account for a large portion of the savings for many municipal (and IOU) programs.

3. **Lower DEER savings.** Recent DEER updates have lowered the estimated energy savings for a wide variety of measures. The reductions result primarily from improved building stock and updated codes and standards that raise the natural replacement baseline against which efficiency measures are compared.

4. **Lower NTG ratios**: The updated DEER NTG table included many additional measure categories as compared to previous years. Also, many NTG estimates have been updated to reflect the results of Evaluation, Measurement and Verification (EM&V) studies undertaken in recent years. For many measure categories, this results in lower NTG ratios as compared to previous years. This both reduces the net savings and increases the free-rider incentive cost included in the TRC.

For these reasons, lower net savings and TRC ratios are being reported for many utilities compared to 2010 and before. This is primarily a reflection of changes in the avoided costs and DEER measures rather than fundamental differences in utility programs.

Energy Efficiency Program Results

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 expected & actual energy savings can be found in **Appendix A**.

Table 2 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. The LADWP and SMUD had peak savings during the reporting period of approximately 37 megawatts. Another 12 utilities (Anaheim, Burbank, Glendale, Imperial ID, Modesto, Palo Alto, Pasadena, Riverside, Roseville, Silicon Valley, Truckee Donner, and Turlock ID) had peak savings that fell in the range of 1-9 megawatts.

Table 2. Summary of Utility Results, FY 11/12

All POU Summary	Resource Savings Summary				Cost Summary			
	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	TRC
Alameda	341	2,526,814	35,281,423	19,473	427,182	455,312	882,494	2.34
Anaheim	8,245	24,336,905	226,228,243	133,559	1,223,472	-	1,223,472	6.84
Azusa	672	3,035,713	30,971,547	17,500	1,338,353	101,713	1,440,066	1.92
Banning	51	88,472	1,328,634	836	34,225	65,625	99,850	0.82
Biggs	1	15,213	177,420	93	7,443	8,619	16,062	0.75
Burbank	4,386	10,951,949	110,558,813	67,458	2,795,035	995,016	3,790,051	1.76
Colton	60	419,868	4,255,646	2,512	81,580	-	81,580	6.08
Corona	-	4,060	-	2	-	8,334	8,334	2.57
Glendale	1,518	13,518,607	102,370,822	58,891	2,678,747	317,965	2,996,712	1.90
Gridley	183	312,477	2,727,047	1,502	101,959	48,900	150,860	1.72
Healdsburg	75	198,232	2,766,624	1,494	59,540	41,022	100,562	1.19
Hercules	0	196	2,535	1	250	-	250	0.24
Imperial ID	6,369	25,304,576	318,237,206	185,407	9,205,734	2,075,544	11,281,278	1.55
LADWP	15,284	89,486,817	1,006,967,673	604,845	27,001,038	10,274,782	37,275,820	2.45
Lassen	319	778,184	5,352,414	2,890	211,537	93,642	305,179	0.59
Lodi	939	2,332,693	22,549,428	12,458	431,580	110,362	541,942	2.04
Lompoc	76	585,728	3,102,871	1,664	36,741	19,124	55,865	0.95
Merced	50	2,567,792	23,866,898	12,990	375,875	201,456	577,331	1.26
Modesto	2,044	12,930,995	184,690,712	99,964	1,483,763	1,412,868	2,896,631	1.76
Moreno Valley	4	32,196	230,579	129	3,507	-	3,507	2.67
Needles	7	6,824	122,828	78	164,063	-	164,063	4.49
Palo Alto	1,101	12,301,792	151,923,880	89,876	1,589,685	1,452,143	3,041,828	2.45
Pasadena	2,535	13,336,746	155,088,720	92,175	2,772,657	639,651	3,412,308	1.22
Pittsburg	13	45,898	613,974	340	15,237	8,182	23,419	1.26
Plumas-Sierra	12	72,948	631,962	359	29,482	88,568	118,049	0.49
Port of Oakland	34	182,682	1,826,820	1,012	10,746	-	10,746	10.40
Rancho Cucamonga	28	134,986	2,362,276	1,273	6,194	32,000	38,194	4.24
Redding	457	345,415	5,168,863	4,225	914,961	134,625	1,049,586	1.38
Riverside	5,487	21,243,985	248,293,936	150,302	3,389,280	749,409	4,138,689	2.99
Roseville	1,775	5,569,799	65,245,164	37,978	2,201,306	1,326,637	3,527,943	2.49
San Francisco PUC	639	3,142,299	60,055,226	32,994	4,018,583	116,853	4,135,436	1.82
Shasta Lake	722	602,133	4,736,179	2,589	303,651	117,450	421,101	1.18
Silicon Valley	3,032	19,225,205	348,198,635	184,247	1,807,075	1,579,709	3,386,784	3.19
SMUD	21,573	162,380,529	1,373,259,524	593,935	21,211,535	16,309,066	37,520,601	2.54
Trinity PUD	2	15,033	374,401	227	28,979	-	28,979	2.65
Truckee Donner	2,635	2,734,763	26,013,147	14,067	576,408	294,901	871,309	2.38
Turlock ID	1,115	4,876,881	52,107,590	28,322	436,881	254,739	691,620	1.26
Ukiah	152	802,099	9,663,386	5,282	184,234	68,888	253,122	3.08
Vernon	626	3,262,867	51,168,329	30,304	320,742	54,269	375,011	9.10
-	-	-	-	-	-	-	-	-
Summary	82,561	439,710,369	4,638,521,376	2,493,253	$87,479,258	$39,457,373	$126,936,631	2.66

Note: All data is fiscal year, except for the following calendar year utilities: IID, Merced, Modesto, Plumas Sierra, SMUD, Truckee Donner, and TID.

With respect to cost effectiveness, the aggregated TRCs for public power equals 2.66 in FY11/12, meaning public power energy efficiency programs produce over two and a half dollars in societal benefits for every dollar spent. In virtually all cases, TRCs for individual utilities satisfy the criteria for providing cost-effective savings to their respective communities.

Table 3 reviews the aggregated results by program sector. From the tables, it is clear that lighting and cooling programs once again account for the largest share of the savings. Regarding specific program results, lighting (particularly non-residential direct installations) continues to dominate public power energy efficiency programs, accounting for almost half of the total energy savings achieved (48%). Utility rebates accounted for the majority of program expenditures, although about one-third of the total was dedicated to utility marketing, administrative costs, and evaluation, measurement, and verification (EM&V) efforts.

Table 3. Summary by Program Sector, FY 11/12

All POU Summary		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	4,921	758	758	953,265	8,015,036	4,178	$ 400,969	$ 423,372	$ 824,340
HVAC	Res Cooling	62,022	7,452	8,428	10,434,971	191,579,727	111,769	$ 6,085,398	$ 4,253,751	$ 10,339,149
Appliances	Res Dishwashers	2,405	202	202	81,541	973,277	520	$ 141,105	$ 134,041	$ 275,146
Consumer Electronics	Res Electronics	55,388	1,218	1,218	10,067,492	100,521,964	43,513	$ 887,619	$ 813,776	$ 1,701,395
HVAC	Res Heating	607	286	286	982,101	17,677,814	7,661	$ 285,601	$ 139,061	$ 424,661
Lighting	Res Lighting	2,203,378	17,692	12,706	66,635,050	531,262,458	244,064	$ 5,753,044	$ 3,075,784	$ 8,828,829
Pool Pump	Res Pool Pump	2,649	258	258	1,487,126	14,871,259	8,443	$ 2,451,865	$ 254,047	$ 2,705,912
Refrigeration	Res Refrigeration	44,244	2,713	2,713	22,862,475	201,093,343	110,506	$ 10,154,131	$ 1,384,047	$ 11,538,178
HVAC	Res Shell	14,296	3,026	3,064	6,306,906	78,346,965	47,053	$ 4,356,868	$ 1,052,200	$ 5,409,068
Water Heating	Res Water Heating	8,818	1,754	1,754	118,240	1,801,819	893	$ 81,043	$ 48,047	$ 129,090
Comprehensive	Res Comprehensive	75,322	2,521	2,521	32,597,073	176,507,588	86,289	$ 8,042,796	$ 3,943,799	$ 11,986,595
Process	Non-Res Cooking	4	4	4	17,123	178,955	99	$ 3,605	$ 247	$ 3,852
HVAC	Non-Res Cooling	22,807,837	11,643	11,899	64,132,387	969,605,577	539,321	$ 10,221,270	$ 6,720,402	$ 16,941,672
HVAC	Non-Res Heating	26			62,048	1,400,223	791	$ 313,067	$ 16,896	$ 329,962
Lighting	Non-Res Lighting	12,448,483	29,129	26,901	145,265,000	1,473,108,322	834,988	$ 27,735,164	$ 10,487,118	$ 38,222,283
Process	Non-Res Motors	207,871	109	394	2,031,456	31,520,668	17,547	$ 263,189	$ 170,263	$ 433,452
Process	Non-Res Pumps	2,631	84	73	3,356,340	27,488,491	15,518	$ 178,969	$ 80,663	$ 259,632
Refrigeration	Non-Res Refrigeration	35,664	1,893	880	15,516,492	161,154,490	86,245	$ 1,396,447	$ 1,125,702	$ 2,522,149
HVAC	Non-Res Shell	3,365	323	330	1,931,869	23,116,464	13,602	$ 423,595	$ 138,110	$ 561,705
Process	Non Res Process	96	1,846	1,856	18,823,688	218,100,560	105,220	$ 1,250,173	$ 1,444,556	$ 2,694,729
Comprehensive	Non Res Comprehensive	14,185,644	6,300	6,300	35,469,674	403,569,702	211,001	$ 7,050,672	$ 3,717,875	$ 10,768,546
Other	Other	143,963	18	18	578,054	6,626,674	4,032	$ 2,668	$ 33,616	$ 36,284
SubTotal		52,309,634	89,228	82,561	439,710,369	4,638,521,376	2,493,253	$ 87,479,258	$ 39,457,372	$ 126,936,630
T&D	T&D	3	179	179	1,727,000	28,848,500	15,778		$ 4,224	$ 4,224
Total		52,309,637	89,407	82,741	441,437,369	4,667,369,876	2,509,031	$ 87,479,258	$ 39,461,596	$ 126,940,853

EE Program Portfolio TRC Test	**2.66**

Table 4 summarizes POU energy efficiency program savings and cost information for fiscal years 2006 through 2011.[3] During FY11/12, POUs spent approximately $127 million on energy efficiency programs, the fifth consecutive year utility energy efficiency investments have exceeded $100 million. When added to investments since the signing of SB1037, public power has spent over three-quarters of a billion dollars on

[3] 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 FY12/13 is actually calendar year 2012. CMUA, NCPA, SCPPA, and CEC staff recognize this data nuance.

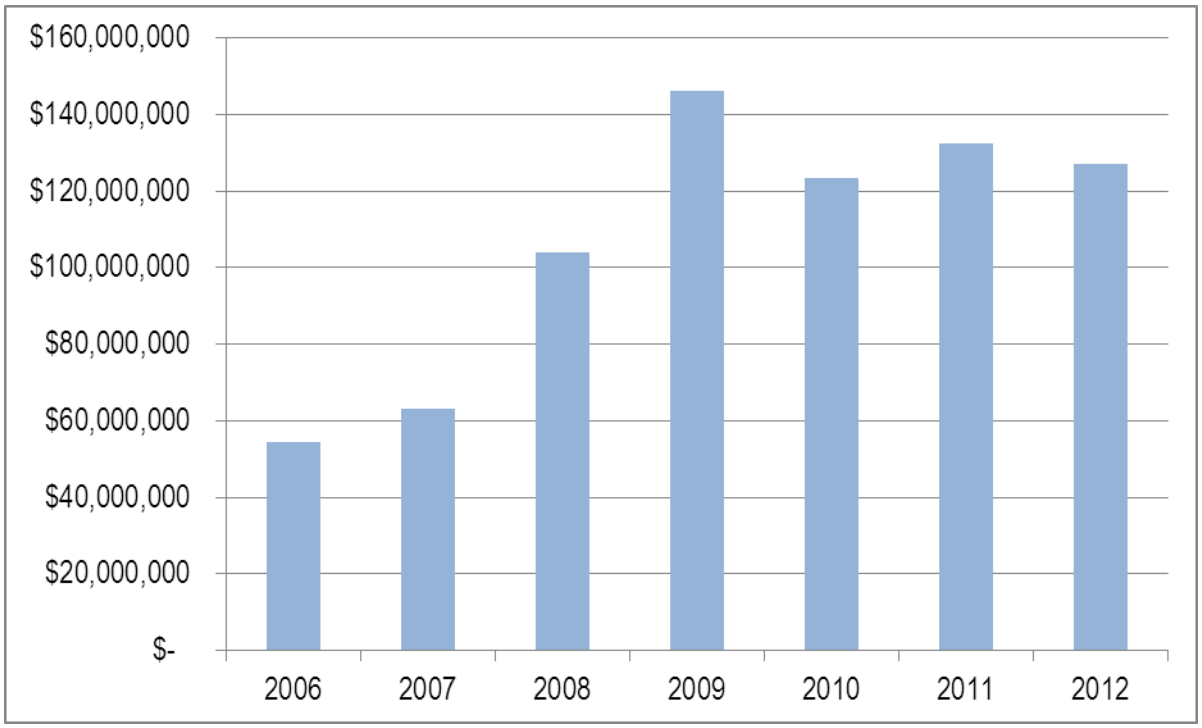
energy efficiency. Supporting those investments were reductions in peak demand last year of 82.5 megawatts as well as more than 439.7 million kWh of energy saved over the course of the year.

Table 4. Summary of Programs, 2006-2012

2006-2012 Publicly-Owned Utility Program Results				
Year	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle MWH Savings	Total Utility Cost ($)
FY05/06	52,552	169,302,601	2,249,214	$ 54,412,728
FY06/07	56,772	254,331,659	3,062,361	$ 63,151,647
FY07/08	82,730	401,919,205	4,473,801	$ 103,907,266
FY08/09	117,435	644,260,232	6,749,912	$ 146,093,107
FY09/10	93,712	522,928,998	5,586,299	$ 123,433,250
FY10/11	81,121	459,458,539	4,604,364	$ 132,372,795
FY11/12	82,561	439,710,369	4,638,521	$ 126,936,631
TOTAL	**566,883**	**2,891,911,603**	**31,364,473**	**$ 750,307,425**

Chart 4 shows the trends in public power program expenditures since 2006. With total expenditures now at $126.9 million, 2012 represents the fifth consecutive year that public power expenditures topped the $100 million threshold.

Chart 4. Total Program Expenditures, 2006-2012



The largest 15 utilities measured by annual kilowatt hours of savings provided nearly 96 percent of the amount reported by the entire POU community. Table 5 provides the FY 11/12 data for the 15 utilities and shows their combined energy savings as a percentage of the total POU energy savings for the year.

Table 5. Utilities Most Heavily Influencing Energy Efficiency Savings

FY 11/12 Energy Savings- Top (15) Utilities				
Utility	**Net Peak KW Savings**	**Net Annual KWh Savings**	**Utility Percent of Total Savings**	**Cumulative Percentage of Total Savings**
SMUD	21,573	162,380,529	36.9%	36.9%
LADWP	15,284	89,486,817	20.4%	57.3%
Imperial ID	6,369	25,304,576	5.8%	63.0%
Anaheim	8,245	24,336,905	5.5%	68.6%
Riverside	5,487	21,243,985	4.8%	73.4%
Silicon Valley	3,032	19,225,205	4.4%	77.8%
Glendale	1,518	13,518,607	3.1%	80.8%
Pasadena	2,535	13,336,746	3.0%	83.9%
Modesto	2,044	12,930,995	2.9%	86.8%
Palo Alto	1,101	12,301,792	2.8%	89.6%
Burbank	4,386	10,951,949	2.5%	92.1%
Roseville	1,775	5,569,799	1.3%	93.4%
Turlock ID	1,115	4,876,881	1.1%	94.5%
Vernon	626	3,262,867	0.7%	95.2%
San Francisco PUC	639	3,142,299	0.7%	95.9%

Continuing a long-standing trend within the public power community, the majority of energy efficiency program impacts reflect public power's two largest utilities: LADWP and SMUD. From a state policy perspective focused on the need to understand the diversity of public power utilities, it is important to understand the energy efficiency program trends of the other POUs across the state. Table 6 highlights public power's commitment to energy efficiency programs, excluding LADWP and SMUD. During FY11/12, the remaining utilities spent over $52 million on energy efficiency programs. Overall expenditures increased slightly (1.7%) compared to the previous year, while peak load reductions jumped up nearly 20%, rising to 45 megawatts, the highest level achieved since SB1037 reporting began. Net annual energy savings also increased by 26.3 million kWh, representing an increase of over 16% over last year.

Table 6. Summary of All POU Programs (excluding LADWP & SMUD), 2006-2012

2006-2012 Results - Excluding LADWP & SMUD				
Year	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle MWH savings	Total Utility Cost ($)
FY05/06	19,292	67,766,218	953,628	$ 21,921,485
FY06/07	21,174	96,740,737	1,402,162	$ 28,663,125
FY07/08	37,822	171,738,010	2,079,276	$ 39,000,521
FY08/09	40,791	208,658,443	2,670,085	$ 45,476,667
FY09/10	37,781	219,315,182	2,529,693	$ 51,301,075
FY10/11	38,285	161,571,624	1,909,185	$ 52,061,405
FY11/12	45,705	187,843,023	2,258,294	$ 52,140,211
TOTAL	**240,849**	**1,113,633,237**	**13,802,323**	**290,564,490**

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, it is assumed that 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. Table 7 illustrates just how effective public power utilities are in their ability to deliver benefits to the communities they serve. 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.

Table 7 shows POU expenditures as both a percent of retail sales, and as the total program cost per net unit of energy saved in the first year. The average cost per kWh saved for all POUs is 29 cents per kWh. However, this total does not capture the full electricity savings over the lifetime of different measures. The cost per kWh saved over the

lifetime of the energy efficiency measures is an estimated at less than 3 cents per kwh. It is clear that California's POUs have established a high benchmark for efficient and effective delivery of energy efficiency programs.

Table 7. Efficacy of Public Power Energy Efficiency Programs

2012 Estimated retail sales	$	7,534,650,900
2012 Efficiency program expenditures	$	126,936,631
Expenditures as a percent of sales		1.68%
Cost per kWh saved (first year)	$	0.29
Cost per kWh saved (lifetime)	$	0.027

IV. 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.

While minor changes were made in the last legislative session to the text of the Public Utilities Code regarding EM&V analyses, nothing in AB 2227 was intended to change the original requirements of AB 2021 related to EM&V analyses and reports. Specifically, language in the statute memorializes POU commitments to continue annual reporting to the CEC on the total investments in energy efficiency, descriptions of the program expenditures, cost-effectiveness of the programs and expected savings, the sources of funding, and methodologies and inputs used to determine cost effectiveness. Because the intent of AB 2227 was not to change anything substantive from the previous version of the PU Code, public power commits to annual submittals of the results associated with independent EM&V analyses, consistent with the original provision of AB 2021[4].

The EM&V process is 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. Results from the EM&V studies provide utility program managers with feedback to improve program effectiveness.

During the past year, the CEC has conducted several workshops regarding the evaluation 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.

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[4] AB 2021, Ch. 734, Section 3(e)(3). (Formerly PU Code § 9615(3)(e)(3) - "Each local publicly owned electric utility shall report annually to its customers and to the State Energy Resources Conservation and Development Commission . . . the results of an independent evaluation that measures and verifies the energy efficiency savings and reduction in energy demand achieved by its energy efficiency and demand reduction programs."

Utility Updates Regarding Independent Evaluation Activities

As a practical matter, EM&V reports are intended to be used by utilities to understand the effectiveness of specific program areas with the purpose of enhancing programs offerings in the future. In general, many of the EM&V studies completed to date have focused on high savings impact measures and measures that exhibit the greatest levels of uncertainty. Key findings from the initial volume of 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.

Ironically, 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 investor-owned utilities 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 70 separate EM&V studies. Unless otherwise noted, each document is available at http://www.ncpa.com/current-issues/energy-efficiency-em-v-reports.html. A number of utilities are currently in the process of completing EM&V studies for 2012 programs. These and other subsequent reports will be posted to the above URL as they become available.

Below are descriptions of EM&V activities from a sampling of POUs. The listed activities are by no means exhaustive. These examples are included to provide a cross-section of how EM&V integrates within POU energy efficiency program planning. (A complete list of EM&V reports available for review can be found in **Appendix B**.)

Alameda

AMP completes evaluation, measurement, and verification (EM&V) of energy efficiency programs each year and the study is submitted every two years. EM&V has been completed and submitted for FY 2010 and 2011. The next EM&V study will be for FY 2012 and 2013.

Azusa

Azusa Light & Water contracted with Lincus Energy in 2010 to complete a study of various FY 2008-09 energy efficiency programs and the associated savings. The Lincus study is available on the CMUA website and Azusa Light & Water will continue to make EM&V reports available to the CEC and other parties. Azusa Light & Water plans to continue with its EM&V programs and practices

Banning

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.

Biggs

Third-party Evaluation, Measurement and Verification studies performed at the close of fiscal years 2008, 2009 & 2010 confirmed an average of 97% of energy savings reported by the City of Biggs in our annual SB1037 report. Verification of demand savings averaged 96%. The City of Biggs has moved to a three year EM&V reporting period, with the next report due at the end of fiscal year 2013.

Burbank

In 2010, Lincus Energy completed an EM&V study of BWP's FY 2008-09 program savings. The Lincus study is available on the CMUA website, and Burbank will continue to make EM&V reports available to the CEC and other parties. Burbank plans to continue third-party EM&V work, focusing on programs that produce the greatest energy savings. The utility plans to evaluate at least one significant program annually.

Glendale

The existing EM&V Plan evaluating Glendale's selected energy efficiency programs is based on the kWh savings. This Plan describes the programs, not only in what they do, but how much energy and demand is saved, and costs expanded during the 2008/2009 fiscal year. The purpose of this EM&V study is to ensure that measures are installed as claimed by Glendale and to lend credibility to Glendale's savings reports as compared to the industry standards that were available at the time of GWP's program processing and implementation. In addition to meeting regulatory compliance requirements, EM&V studies are essential for a number of other reasons, namely: 1) to measure the effectiveness of existing programs and 2) to educate the program implementer on ways to improve existing and future programs.

Lodi

Lodi has implemented an EM&V Plan and has completed five annual assessments of randomly selected programs and large rebates as part of the designed EM&V Plan. For FY 11-12, projected energy savings were verified for five large customer rebates, and were assessed in October of 2012. Note: Lodi retained the services of Summit Blue/Navigant Consulting to assist in the creation of the aforementioned Lodi EM&V Plan, as well as the on-site, first, second and third year kWh savings verification processes. Lodi has utilized ERS Consulting for similar kilowatt hour and kilowatt verification savings in 2011 and 2012.

LADWP

LADWP is currently in the process of renewing services of an independent third party to evaluate its energy efficiency programs. During 2011, the incumbent firm completed assessments of energy efficiency projects

done in fiscal year 2009-2010 (July 1 – June 30). Projects reviewed represent a random sampling from the LADWP's energy efficiency program portfolio, with a focus on non-residential programs.

LADWP plans to continue evaluation, measurement and verification activities through 2015, with an emphasis on improving evaluation criteria, sampling methods, depth of program evaluation and transparency of annual EM&V reports to be completed over the 2011 through 2014 fiscal years. LADWP plans on following the POU EM&V Guidelines developed by the CEC and is working closely with the CEC to improve its EM&V program.

Modesto

In 2012, MID made continued efforts to obtain independent, third-party review of its EE programs. MID has hired Power Services, Inc. (CVMP qualified) to perform M&V, at the time of rebate submission, on selected larger projects throughout the year. MID also hired Robert Mowris and Associates to conduct an annual M&V report on MID's 2011 energy efficiency programs. We expect for work to begin work with our consultant on the 2012 annual M&V report in the immediate future.

Palo Alto

Palo Alto has contracted with Navigant Consulting to conduct EM&V studies each year since FY 2009. Each year, impact analyses are completed on the programs with the greatest impact on total savings and/or the most unusual or potentially unrealized savings. In addition, a process analysis is completed on a program, such as washing machine rebates, that has not recently been analyzed in depth. The results from these programs are used to revise, create and/or delete efficiency programs in the upcoming years.

Pasadena

In FY11/12, PWP continued to conduct EM&V activities on its energy efficiency programs to justify program design and expenditures, as well as verify program results to PWP's electric distribution system. Such EM&V actions were taken on the following programs:

- **Energy Star**: Contractor performed site verification on 10% of all residential efficiency equipment purchases and installations; he also left behind 3 CFL's with each customer verified.
- **Prescriptive rebates**: Use "natural replacement" deemed savings per the E3 tool for prescriptive rebates, except where customers indicate "early replacement" eligibility (based on equipment age) on rebate applications.
- **Refrigerator recycling and replacement program**: Equipment verifications were provided by ARCA, the vendor who delivers and recycles these units.
- **Energy Efficiency Partnering (EEP) program:**

- Mechanical Equipment Retrofits: PWP's independent engineering contractor calculated energy savings and demand reduction using the Department of Energy's eQuest building modeling software for all mechanical projects including central plants, chillers, package units, and motors.
- Lighting: PWP used an engineer-certified lighting calculator (Excel workbook) to calculate lighting retrofit project energy savings based on the actual hours of operation. Lighting accounted for 75% of the FY11/12 EEP projects.
- Data loggers and CT's were used to verify operating hours and equipment savings on 10 % of EEP mechanical projects and 23% of EEP lighting projects.

Plumas-Sierra

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.

Riverside

As part of the City's annual audit process RPU requested a separate program audit pertaining to its Energy Efficiency programs. The goal was to review rebate processes, procedures and supporting documentation. The final report includes findings and recommendations for program improvement. 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 for 100% of all commercial rebate participants, including a review of historical energy usage and energy-saving calculations.
- 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 outside engineering firms to verify claimed energy savings on large, complex or technical commercial projects prior to issuing an incentive.
- Audits and installations performed by third-party contractors for RPU direct installation programs have high inspection rates that are performed by the consultant and RPU staff.
- Refrigerator recycling program administered by Appliance Recycling Centers of America (ARCA) assures proper verification when the contractor is picking up old appliances for recycling.

SMUD

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 two 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 has awarded or is in the process of awarding contracts for consultants to perform evaluations of the following programs in 2013:

- Residential— Appliance Efficiency, Residential Energy Advisory, Whole House Comprehensive (Single and Multi-Family)
- Commercial— Prescriptive Lighting (persistence of savings and market potential), Custom Retrofit, Savings By Design (new construction)

San Francisco PUC

Currently, Power Enterprise's EM&V approach results in the large majority of energy efficiency retrofit projects including an individual M&V study, with some variations by program. For the Direct-Install ("General Fund") program, project-level M&V has been conducted for nearly every retrofit project. The program follows the International Performance Measurement and Verification Protocol (IPMVP). Each project currently includes an M&V plan with a sampling plan, a logging plan, an approach to data recovery and analysis, and a written report. Lighting projects are evaluated based on IPMVP Option A, which calls for a combination of measured data (from loggers) and stipulated data for kW reductions (from the California Standard Performance Contracting program). For mechanical projects, specific IPMVP options are selected for each energy efficiency measure, depending on conditions.

For the Audits and Technical Assistance ("Enterprise") program, EM&V varies from project-level M&V studies to simple field verification, depending on the level of capital investment by Power Enterprise. For the Civic Center Sustainability District program, representative projects are being selected for project-level M&V. The M&V approach for the Green Commissioning and Design Review program is currently being determined on a project by project basis. For reporting purposes, verified savings calculations, as they become available, are used to update estimated savings.

Shasta Lake

Shasta Lake completed their EM&V report in early 2011. The report focused on the program that produced the largest amount of savings during the 2009/2010 year, the commercial lighting program. The report can be found on the City's website. The city has procured a contractor to perform their EM&V report for FY11. The report will focus on Appliances and Weatherization.

Silicon Valley Power

Silicon Valley Power contracted with Summit Blue Consulting, LLC to create an EM&V plan, which was delivered in Fall 2008. Resulting from that plan, SVP contracted with Summit Blue to perform the evaluation of its FY 2007-2008 energy efficiency programs, which was completed in January 2009, and the FY 2008-2009 energy efficiency programs, which was completed in December 2009. Summit Blue was acquired by Navigant Consulting and evaluated SVP's FY 2009-2010 energy efficiency programs under the new name. SVP contracted with The Cadmus Group for its FY 2010-2011 study and is utilizing them again for the FY 2011-2012 study. A copy of the results of this study is available on the NCPA website along with studies performed for other utilities.

V. 10-YEAR ENERGY EFFICIENCY TARGETS

Assembly Bill 2021 (Levine, 2006) directed the CEC every three years to identify all potentially achievable cost-effective electricity and natural gas 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.[5] This chapter discusses updated energy efficiency targets adopted by POUs through 2024, as well as the modeling tool, developed by Navigant, used to help establish the targets.

Energy Efficiency Resource Assessment Model (EERAM)

The Energy Efficiency Resource Assessment Model (EERAM) is an energy efficiency potential model designed to estimate technical, economic, and market energy efficiency potential for a utility's service area. Developed by Navigant, the model forecasts energy savings and demand reduction potential within the residential, commercial, and industrial sectors over a forecast period of typically 20 years. Since its inauguration in 2007, the model has been used by over 50 different electric and natural gas utilities across the country to identify future energy conservation potential. The following information regarding EERAM was prepared by Navigant and furnished to POUs as background on the tool. (For the complete report prepared by Navigant, see **Appendix D**.)

EERAM is an Excel spreadsheet model based on the integration of energy efficiency measure impacts and costs, utility customer characteristics, utility load forecasts, and utility avoided costs and rate schedules. Excel is used as the modeling platform to provide transparency to the estimation process. Using Excel also allows the model in be customized to each client's unique characteristics and accommodate either detailed or more general model input data.

The model utilizes a "bottoms-up" approach, using the starting points of study area building stocks and equipment saturation estimates, forecasts of building stock decay and new construction, energy efficiency technology data, past energy efficiency program accomplishments, and decision maker variables that help drive the market scenarios.

For existing energy efficiency measures, EERAM calculates market potential based on a decision maker adoption rate algorithm. This algorithm is primarily a measure by measure elasticity response to measure payback. However, a diffusion curve methodology is used for emerging technologies. Emerging

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[5] Section 9505(b) of the Public Utilities Code reads: "*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.*

technologies are considered to follow a Bass diffusion curve methodology rather than a measure payback methodology. The Bass diffusion model was developed by Frank Bass and describes the process of how new products are adopted as an interaction between users and potential users.

The model incorporates a number of innovative features. These include:

- Utilization and wherever possible, direct linkage to statewide or utility specific deemed energy savings and cost databases.
- Utilization of utility specific or, if not available, regionally specific building characteristics information. These data often come from on-site or telephone based building surveys of building and appliance stocks. The model is able to include as many different building segments and industrial classifications as there is data available.
- Utilization of decision maker awareness of measures and if aware, the willingness to purchase the energy conservation measure variables. These variables are utilized in the consumer choice algorithm. This data is most often collected at the same time as the building and appliance stock characteristics are gathered through a special decision maker survey.
- Utilization of historical utility specific energy conservation achievements to calibrate model results.
- The ability to create forecasts utilizing either the historical achievement data for calibration or utilizing percent of sales by sector as the first year calibration method.
- The ability to quickly create scenarios based on different measure incentive levels. Other scenarios can also be developed using alternative input data, such as avoided costs, energy forecasts, building stock forecasts, and others that may be of interest to the utility.
- The ability to include a number of different avoided costs streams pegged to specific end-uses.
- The model not only calculates the basic economic tests (described later) but also calculate the Total Resource Cost (TRC) test for the base year and for each year in the forecast. The TRC value is used to screen what is included in the market potential estimates and as technology costs and impacts change over time, so do the TRC values.
    - The TRC screening value is a variable set by the user
    - For emerging technologies, the TRC screen is allowed to be lower, if desired by the user.
- In addition to the TRC values changing over time, the model incorporates time vectors for other key variables as well including:
    - Technology cost
    - Administrative cost.
    - Technology impact
    - Consumer awareness and willingness
    - Avoided costs
- Impacts of known Codes and Standards and the timing of those impacts are included in the modeling structure. These impacts are estimated at the measure level
- The ability to include the interactive effects on other fuel usage (such as natural gas) when electric measures are implemented.

- Recognition that at the end of measure life, actions may take place that affects both cumulative potential and program participation.
    - The model has a variable called "measure re-engagement", which is a percentage estimate of those who continue with the same or more efficient version of the initially implemented measure. The remainder is assumed to fall back to the baseline efficiency. The model adjusts cumulative potential to account for those who fall back to the baseline efficiency.
    - The model has another variable called "re-participants". This is an estimated percentage of the "measure re-engagers" who also again participate in the utility program and receive an incentive. For these customers, their energy savings is assumed to continue but is not counted as new incremental savings. Although there is no new incremental savings, there is a cost associated with maintaining these savings. The additional incentive and administrative costs are added to the program costs.
- Mutually exclusive measures are placed into competition groups. Within the competition groups, the share of the baseline technology that potentially could be affected by the mutually exclusive competing efficient technologies is split based on the TRC values of these competing technologies. For example, if one mutually exclusive technology has a TRC of 1.0 and the other a TRC of 3.0, the applicability factor (share of the base technology) for the first measure is 25% and for the second 75%. This applicability is re-calculated each forecast year as it is likely TRC values change over time with the resulting applicability factors also changing over time.

The model partitions its evaluation of each measure into technical, economic and market potential. Each assessment includes building stock estimates (sales in the industrial sector), technology densities, and measure impacts, each using a different algorithm.

Technical potential is calculated using the product of a measure's savings per unit, the quantity of applicable units in each facility (in the case of industrial, the number of units per kWh of sales), and the number of facilities in a utility service's area. The assessment includes measures that might not be cost-effective or have the backing of a strong consumer market. By disregarding these factors, the technical potential assessment provides an upper bound of efficiency potential regardless of cost or market penetration. For measures considered to be replace on burnout (ROB), the quantity of applicable units per year is limited to the number that need to be replaced, which is determined by measure life. As time passes, this potential population grows until meeting the full measure life. For other, non-replace on burnout measures, the full populations of baseline units are considered available. No net-to-gross adjustments occur with technical potential.

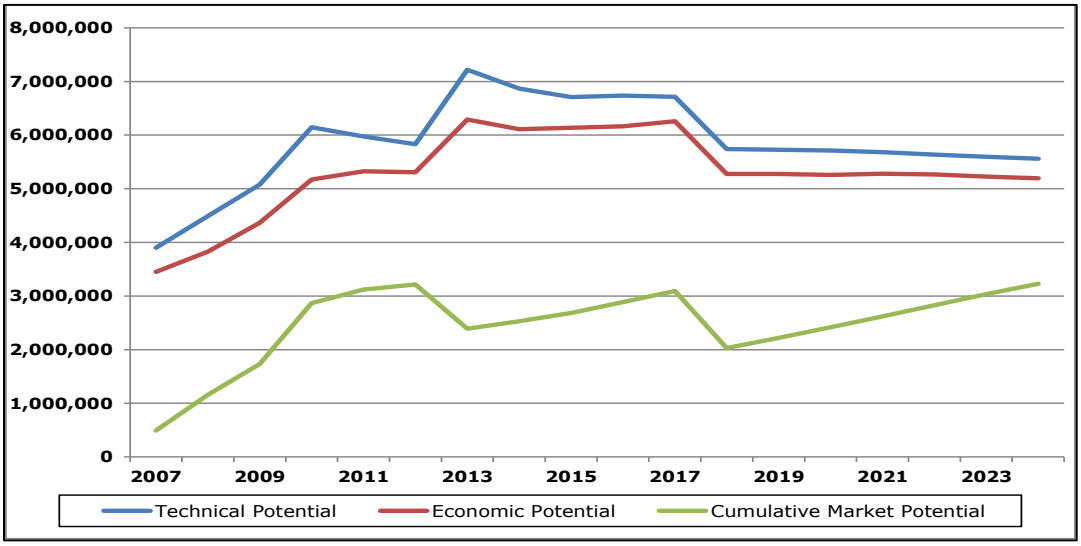
Economic potential estimates the amount of technical potential that is "cost-effective," as defined by the results of the Total Resource Cost (TRC) test. The TRC test is a cost-benefit analysis of relevant energy efficiency measures, excluding market barriers such as lack of consumer knowledge. Benefits include avoided costs of generation, transmission and distribution investments, as well as avoided fuel costs due to energy conserved by energy efficiency programs. Costs include incremental measure costs and programs'

administration costs. The TRC screening value for emerging technologies can be set lower than other technologies if the user wishes it to be. Replace on burnout measures are treated the same as with technical potential and there are no net-to-gross adjustments.

Market potential is the third of EERAM's energy efficiency algorithms, calculating the amount of economic energy efficiency potential that could be captured by utility programs over the forecast period. This calculation varies with the program's parameters, such as the program design or magnitude of incentives or rebates for customer installations. EERAM recognizes six types of program designs, including:

- **Replacement on Burnout**: An energy efficiency measure is implemented after the existing equipment fails.
- **Early Retirement**: An energy efficiency measure normally regarded as ROB is installed before its effective measure life is reached.
- **Retrofit**: An energy efficiency measure that can be implemented immediately. The lifetime of the base technology is not a factor as RET measures generally do not replace existing technologies, but rather improve the efficiency of existing technologies. The energy impact is therefore the amount of that improvement.
- **Emerging Technology**: An energy efficiency measure is just entering or about to enter the marketplace. Market potential is calculated differently for Emerging Techs, using a Bass diffusion model rather than the traditional measure payback.
- **Behavioral Programs**: These are programs that are designed to influence consumer behavior through the provision of training and/or information. As with emerging technologies, market potential is calculated using a Bass diffusion model rather than the traditional measure payback.
- **New Construction**: A measure or package of measures is installed at the time of construction.

Sample Graph of Technical, Economic, and Market Potential



Source: Navigant

EERAM also calculates several financial tests, including:

- **Total Resource Cost (TRC)**: Mentioned earlier, this test includes all quantifiable costs and benefits of an energy efficiency measure, regardless of who accrues them.
- **Utility Cost Test (UCT)**: This test measures the net costs of an energy efficiency program based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant.
- **Ratepayer Impact Test (RIM)**: This test measures what happens to customer bills or rates due to changes in utility revenue and operating costs caused by the program.
- **Participant Cost Test (PCT)**: This test measures the quantifiable benefits and costs to the customer due to participation in the program.
- **Simple Customer Payback**: This measurement calculates the program payback by taking the measure cost less the incentive received and divides it by first year energy bill savings.
- **Levelized Measure Cost/kWh**: This measure multiplies the energy efficiency measure costs by the Capital Recovery Factor, and divides by the first year kWh savings.

Outputs from the model are designed to accomplish multiple objectives, including:

- Determine the total cost-effective energy savings available over the forecast period, both annually and cumulatively. This is determined for 100% of retail energy use in utility service territories. These estimates are provided at the sector, program type, and end-use classification levels.
- Provide guidance for the utilities' next energy efficiency goals at an aggregate level, as well as at the measure category level, where appropriate. To ensure continuity with past utility program achievements, the EERAM calculations are calibrated to past utility achievement levels.

Measure Re-Engagement and Re-Participation

Estimating measure re-engagement and re-participation is a two-step function used both to identify what share of initial participants continue saving energy by installing a new measure similar to the original measure and second, what portion of these re-engagers again partake in a utility program. If the re-engaging share is 85% (which is what the variable is the current default value), then 15% are thought of as returning to the baseline population. As this 15% are once again members of the baseline population, they can now participate in any program that affects this baseline.

There are no incremental savings accruing from this re-engaging population. However, cumulative savings must be adjusted in two ways. First, the 15% that go back to the baseline population needs to have their savings removed from cumulative savings. Second, for the 85%, adjustment to cumulative potential is dependent upon whether the savings are different from what was achieved at the time of the original participation. If unchanged, no changes to cumulative potential. If savings are different, then the cumulative potential is adjusted by this delta difference.

Re-participants are the re-engagers that again take advantage of the utility program at the point of re-engagement. All energy impact adjustments to cumulative potential have been performed when estimating the impacts from re-engagers. However, with re-participants, the utility is incurring additional incentive and administrative costs, although they gain no additional incremental savings.

Currently, the CPUC believes that re-participation is about 50% of original participants. To come to this 50%, the re-participation variable is currently set to 60%. This says that 60% of the re-engaging population (85%) are re-participants (85% * 60% = 51%). Incentive and admin costs are incurred by the utility for this 51% group of re-participants. In order to identify the amount of energy impact that is represented by these re-participants, EERAM has separate tables that identify this total.

Potential Changes in Measure Costs Over Time

Measure technology costs are allowed to change over time and have technology cost vectors similar to the measure efficiency time vectors. Based on a US Department of Energy paper, technology costs come down over time at a rate that varies by technology. Within EERAM, the measures are mapped to a code that best matches the curves of technology cost reduction as identified in the DOE paper. This code matches the appropriate learning curve to the technology, with several technologies coded as having no change. Another variable estimates where the technology is on the learning curve in terms of maturity.

Appliance Recycling

Appliance recycling programs need special treatment because of the unique characteristics of the base population. Unlike other base technologies, the used appliance stock available for recycling is constantly being refreshed with new populations of appliances. Due to past improvements to appliance efficiencies (primarily Codes & Standards), the constantly refreshing population of available appliances for recycling is more efficient (and thus saves less energy) from year to year. Available populations of appliances for recycling do not change significantly from year to year, but the time vector of savings per unit does decline.

Behavior Based Energy Savings Potential

Savings potential from behavior-based initiatives was included in the EERAM model. For the purposes of this study, Navigant defines behavior-based initiatives as those providing information about energy use and conservation actions, rather than financial incentives, equipment, or services. These initiatives use a variety of implementation strategies including mass media marketing, community based social marketing, competitions, training, and feedback. Outcomes from behavior-based initiatives that result in energy savings can be broadly characterized as equipment-based and usage-based:

- Equipment-based behavior – Savings from the purchase and installation of higher efficiency equipment, relative to baseline conditions. Examples of equipment-based behavior include the replacement of lights with higher efficiency lights, purchasing Energy Star qualified appliances, and purchasing premium efficiency motors. In the EERAM Model, these savings are modeled at the equipment level as contributions to the percentages of the population that are aware of the

measure and that are willing to adopt this measure. Equipment-based behavior can be sub-categorized as:

  - Non-incented equipment-based behavior – The purchase of higher efficiency equipment for which no incentives are provided.
  - Incented equipment-based behavior– The purchase of higher efficiency equipment for which incentives are provided. Also known as "channeling".

- Usage-based behavior – Savings from changes in usage and maintenance of existing equipment. Examples of usage-based behavior include turning off lights, unplugging electronics and chargers, programming thermostats, and improving the efficiency of equipment through modified maintenance practices. In the EERAM model, these savings are modeled as an equipment-independent module with savings unassociated with equipment improvement

Navigant found that the most rigorous residential behavior savings estimates available are from feedback program evaluations. Feedback programs provide energy use information to participants in the form of reports, online audits, or in-home displays. Navigant focused on these programs because they broadcast to entire populations and often are implemented with experimental design that enables the precise estimation of impacts. For this study, Navigant narrowed its research to OPOWER Home Energy Report programs and similar periodic feedback report programs that provide monthly information on home energy use as well as the energy use of other homes in the area.

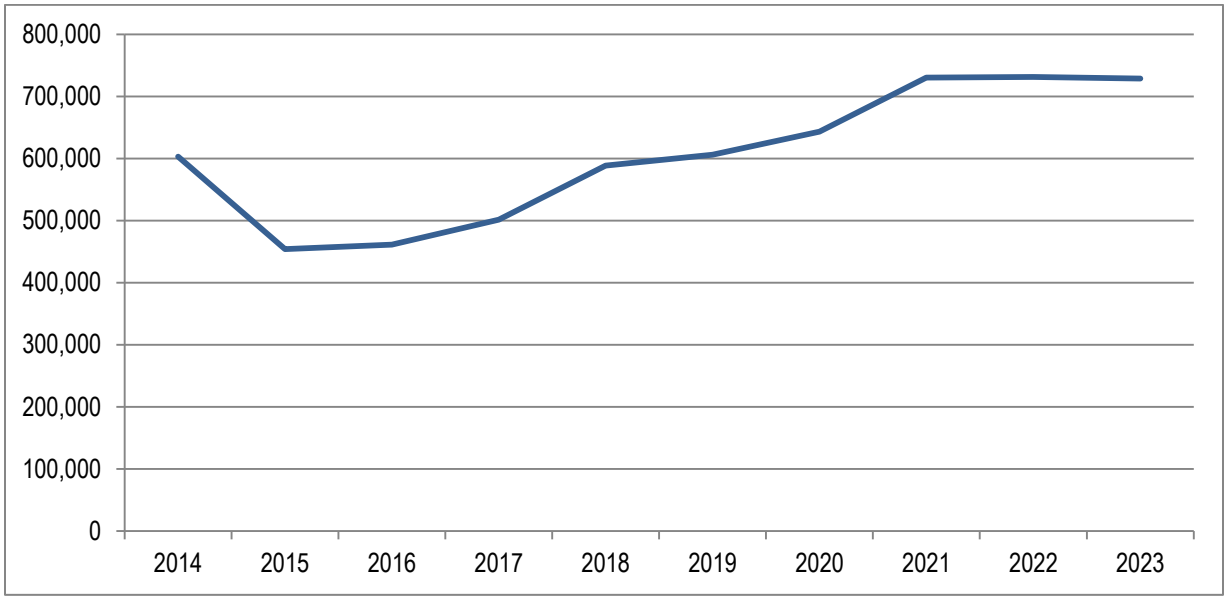
Navigant identified seven recent evaluations covering approximately 15 different programs. Navigant extracted the average household energy reduction from each of these evaluations, which ranged from 1.1% to 2.9% per household and averaged 2.3% across all of the evaluations. These estimates are based on whole-house billing data analysis; while they are precise difference-in-difference estimates of impact at the whole-house level, they cannot identify the specific outcomes that lead to these impacts. This analysis approach cannot differentiate between impacts from individual actions such as turning off appliances, turning down thermostats, or replacing inefficient equipment. Thus, these billing-analysis based impact evaluations alone could not provide the granularity necessary for the EERAM model: the portion of impact from usage-based behavior and portions of impact from specific equipment-based behaviors.

In order to disaggregate the whole building savings into equipment-based and usage-based savings, Navigant searched for relevant impact studies with information about what types of behaviors make up reported savings. Unfortunately, there are few rigorous studies done on this subject. Navigant identified one Home Energy Report impact evaluation that examined this disaggregation effectively. In addition to billing-analysis, the study included surveys of the control and experimental group members that asked what conservation actions the households had taken. The study found that equipment-based actions were the majority of actions for which the experimental group self-reported statistically significant higher rates of activity. However, the evaluation did not translate these reported actions into impact estimates. Based on this qualitative finding, that the examined programs tend to achieve more equipment-based than usage-based outcomes, along with discussions with program implementers, Navigant has estimated that 33% of the savings are equipment-based, and 67% are usage-based.

Updated 10-Year Energy Efficiency Targets

Building off of the EERAM tool designed by Navigant, POUs adopted updated energy savings targets for the ten-year period spanning 2014 to 2013. Averaging over 600,000 MWh in energy savings annually, the recently adopted targets represent a renewed commitment from public power to achieving additional energy efficiency in their service territories. Chart 5 plots the total targeted energy savings for all POUs each year from 2014-2023. (For more information regarding EERAM scenario results underlying individual utility targets, see **Appendix D.**)

Chart 5. Cumulative Energy Savings Targets, 2014-2023.



As is the case when describing any feature of the public power community, the range of energy savings targets varies a great deal by utility. Utilities with higher retail sales will necessarily have higher, in general, energy savings targets than smaller utilities. However, the trendlines of forecasted savings differ a great deal, which is indicative of the unique weather patterns, customer mix, local economic conditions, and other factors of each utility and the efforts of POUs to tailor programs meet the needs of their specific customers.

Table 8 highlights the different trends and denotes the adopted energy savings targets by utility, each year from 2014-2023. Public power is forecasted to save over 6,000,000 MWh over the next ten years. The CEC estimates the average per capita electricity consumption in California is 6,721 kWh per year. To put that in context, the energy savings targets estimate that public power programs will save the same amount of energy as is consumed by approximately 90,000 people annually, translating into lower energy bills for customers, reducing the need to construct new power plants, and decreasing the state's carbon footprint.

Table 8. 10-Year Energy Savings 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%
Hercules	22	24	25	25	21	22	22	23	24	24	232	0.13%
Imperial	16,675	15,773	15,965	17,271	18,039	18,684	21,187	21,745	23,880	27,803	197,022	0.57%
LADWP	***266,000***	***116,000***	***108,000***	***126,000***	***224,000***	***222,000***	***240,000***	***300,000***	***300,000***	***300,000***	***2,202,000***	***1.00%***
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	***151,534***	***148,703***	***160,063***	***175,936***	***167,620***	***184,253***	***195,745***	***215,432***	***207,313***	***200,738***	***1,807,337***	***1.50%***
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	602,383	454,005	461,027	499,687	586,513	601,652	639,712	725,664	725,015	723,311	**6,018,968**	**0.94%**

*IID, LADWP, Rancho Cucamonga and SMUD targets are preliminary. Final targets will be adopted later this year.

**TID's fiscal year is the calendar year and adopted goals for 2013-2022.

Table 9 compares the cumulative energy savings target from 2010 and 2013. As the table notes, statewide energy savings targets for the next ten years are 5.4% below the targets adopted three years ago. Two factors explain this decline. First, the new targets reflect the tail end of a severe economic downturn, which was not fully accounted for when the targets were adopted in 2010. Also, the new numbers account for new benchmark appliance standards which by definition produce less savings compared to older versions. Even with the decline in aggregate, 15 public power utilities were still able to increase their savings target in the 2013 version.

Table 9. Comparison of Total Annual Savings Targets (MWh), 2010 vs. 2013.

Utility	2010 10-Year Total	2013 10-Year Total	% Change
Alameda	18,631	12,068	-35.2%
Anaheim	306,081	249,353	-18.5%
Azusa	24,551	24,756	0.8%
Banning	9,076	6,434	-29.1%
Biggs	385	464	20.4%
Burbank	97,391	116,574	19.7%
Colton	42,082	22,221	-47.2%
Corona	2,678	3,467	29.5%
Glendale	114,330	120,780	5.6%
Gridley	979	1,700	73.6%
Healdsburg	5,396	3,888	-27.9%
Hercules	1,137	232	-79.6%
Imperial	240,041	197,022	-17.9%
LADWP	2,160,000	2,202,000	1.9%
Lassen	7,767	3,073	-60.4%
Lodi	25,575	35,934	40.5%
Lompoc	5,911	2,197	-62.8%
Merced	17,866	12,725	-28.8%
Modesto	186,824	182,491	-2.3%
Moreno Valley	2,655	2,831	6.6%
Needles	2,549	1,511	-40.7%
Palo Alto	73,929	65,855	-10.9%
Pasadena	166,000	127,500	-23.2%
Pittsburg Power	529	1,260	138.1%
Plumas-Sierra	7,033	1,564	-77.8%
Port of Oakland	4,731	1,034	-78.1%
Rancho Cucamonga	796	5,618	605.8%
Redding	38,903	35,630	-8.4%
Riverside	217,651	215,317	-1.1%
Roseville	93,713	78,344	-16.4%
SF PUC	n/a	37,201	n/a
Shasta Lake	7,719	3,049	-60.5%
Silicon Valley	251,003	216,411	-13.8%
SMUD	1,798,000	1,807,337	0.5%
Trinity	139	1403	912.3%
Truckee Donner	19,880	12,838	-35.4%
Turlock	166,603	134,049	-19.5%
Ukiah	4,045	4,167	3.0%
Vernon	83,601	66,430	-20.5%
Victorville	n/a	2,239	n/a
CALIFORNIA	**6,206,179**	**6,018,968**	**-3.0%**

VI. 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. This analysis highlights the continued commitment of the POUs to making significant investments in energy efficiency on behalf of the customers and communities they serve. In addition to recognizing the past and current successes of POU customer energy efficiency programs, this report also outlines energy savings targets for the next ten years.

SB 1037 - Energy Efficiency Program Results

Regarding POU energy efficiency programs provided in FY11/12, the principal findings and conclusions of this analysis are as follows:

- **Significant Investment:** POUs spent nearly $127 million on energy efficiency programs, the fifth consecutive year the $100 million threshold has been exceeded. Since 2006, POUs have invested over $750 million in energy efficiency programs.

- **Peak Demand Reduction:** Public power programs reduced peak demand by more than 82.5 megawatts. Since 2006, POUs have reduced peak demand by over 563 megawatts.

- **Energy Savings:** The net annual kilowatt-hours savings totaled over 439,700,000 kilowatt-hours. Since 2006, POUs achieved nearly 2.89 billion kWh in savings through energy efficiency programs.

- **Cost-Effectiveness:** Applying the Total Resource Cost (TRC) societal test, the principal measure used in the industry to determine whether programs are cost-effective, the aggregated TRCs for public power equals 2.66 in FY11/12, meaning public power energy efficiency programs produce over two and a half dollars in societal benefits for every dollar spent.

- **Large Utilities:** The 15 largest POUs account for 95.9 percent of public power's total energy efficiency savings. Eleven of these utilities had annual net energy savings that exceeded 10,000 megawatt hours.

- **Most Savings:** Lighting continues to dominate public power energy efficiency programs, accounting for almost half of the total energy savings achieved (48%).

- **Efficacy of Programs:** The average cost per kWh saved from all POU programs is $0.29/kWh. However, this total does not capture the full electricity savings over the lifetime of different measures. The cost per kWh saved over the lifetime of energy efficiency measures is estimated at less than 3 cents per kwh ($0.027/kWh).

AB 2021 – Updated 10-Year Energy Savings Targets

The following are key highlights of public power's updated energy savings targets for 2014-2023:

- **Forecasted Energy Savings:** Averaging over 600,000 MWh in energy savings annually, the recently adopted targets represent a renewed commitment from public power to achieving additional energy efficiency in their service territories.

- **Societal Benefits**: The CEC estimates the average per capita electricity consumption in California is 6,721 kWh per year. To put that in context, the energy savings targets estimate that public power programs will save the same amount of energy as is consumed by approximately 90,000 people annually, translating into lower energy bills for customers, reducing the need to construct new power plants, and decreasing the state's carbon footprint.

- **Comparison to 2010 Targets:** Cumulative targets of all public power for the next ten years are 3.0% below the targets adopted three years ago. Two factors explain this decline. First, the new targets reflect the tail end of a severe economic downturn, which was not fully accounted for when the targets were adopted in 2010. Also, the updated targets account for new benchmark appliance standards which by definition produce less energy savings compared to older versions. Even with the decline in aggregate, 15 public power utilities increased their savings target in the 2013 version.

CMUA, NCPA, and SCPPA look forward to our continuing partnership with policymakers on energy efficiency issues and the aggressive promotion of the state's energy loading order. The next edition of this report will be submitted to the CEC on March 15, 2014.

APPENDIX A: DESCRIPTIONS OF UTILITY PROGRAMS

This appendix consists of detailed narratives of each publicly owned utility energy efficiency programs, as well more general descriptions the utilities in general. Utility-specific summaries of their energy programs for FY2012, 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 2012. For more analysis on statewide energy efficiency data, see **Chapter III: Overview of Energy Efficiency & Public Power**.

All POUs – Summary of Energy Efficiency Programs, FY 2012

All POU Summary	Resource Savings Summary				Cost Summary			
	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	TRC
Alameda	341	2,526,814	35,281,423	19,473	427,182	455,312	882,494	2.34
Anaheim	8,245	24,336,905	226,228,243	133,559	1,223,472	-	1,223,472	6.84
Azusa	672	3,035,713	30,971,547	17,500	1,338,353	101,713	1,440,066	1.92
Banning	51	88,472	1,328,634	836	34,225	65,625	99,850	0.82
Biggs	1	15,213	177,420	93	7,443	8,619	16,062	0.75
Burbank	4,386	10,951,949	110,558,813	67,458	2,795,035	995,016	3,790,051	1.76
Colton	60	419,868	4,255,646	2,512	81,580	-	81,580	6.08
Corona	-	4,060	-	2	-	8,334	8,334	2.57
Glendale	1,518	13,518,607	102,370,822	58,891	2,678,747	317,965	2,996,712	1.90
Gridley	183	312,477	2,727,047	1,502	101,959	48,900	150,860	1.72
Healdsburg	75	198,232	2,766,624	1,494	59,540	41,022	100,562	1.19
Hercules	0	196	2,535	1	250	-	250	0.24
Imperial ID	6,369	25,304,576	318,237,206	185,407	9,205,734	2,075,544	11,281,278	1.55
LADWP	15,284	89,486,817	1,006,967,673	604,845	27,001,038	10,274,782	37,275,820	2.45
Lassen	319	778,184	5,352,414	2,890	211,537	93,642	305,179	0.59
Lodi	939	2,332,693	22,549,428	12,458	431,580	110,362	541,942	2.04
Lompoc	76	585,728	3,102,871	1,664	36,741	19,124	55,865	0.95
Merced	50	2,567,792	23,866,898	12,990	375,875	201,456	577,331	1.26
Modesto	2,044	12,930,995	184,690,712	99,964	1,483,763	1,412,868	2,896,631	1.76
Moreno Valley	4	32,196	230,579	129	3,507	-	3,507	2.67
Needles	7	6,824	122,828	78	164,063	-	164,063	4.49
Palo Alto	1,101	12,301,792	151,923,880	89,876	1,589,685	1,452,143	3,041,828	2.45
Pasadena	2,535	13,336,746	155,088,720	92,175	2,772,657	639,651	3,412,308	1.22
Pittsburg	13	45,898	613,974	340	15,237	8,182	23,419	1.26
Plumas-Sierra	12	72,948	631,962	359	29,482	88,568	118,049	0.49
Port of Oakland	34	182,682	1,826,820	1,012	10,746	-	10,746	10.40
Rancho Cucamonga	28	134,986	2,362,276	1,273	6,194	32,000	38,194	4.24
Redding	457	345,415	5,168,863	4,225	914,961	134,625	1,049,586	1.38
Riverside	5,487	21,243,985	248,293,936	150,302	3,389,280	749,409	4,138,689	2.99
Roseville	1,775	5,569,799	65,245,164	37,978	2,201,306	1,326,637	3,527,943	2.49
San Francisco PUC	639	3,142,299	60,055,226	32,994	4,018,583	116,853	4,135,436	1.82
Shasta Lake	722	602,133	4,736,179	2,589	303,651	117,450	421,101	1.18
Silicon Valley	3,032	19,225,205	348,198,635	184,247	1,807,075	1,579,709	3,386,784	3.19
SMUD	21,573	162,380,529	1,373,259,524	593,935	21,211,535	16,309,066	37,520,601	2.54
Trinity PUD	2	15,033	374,401	227	28,979	-	28,979	2.65
Truckee Donner	2,635	2,734,763	26,013,147	14,067	576,408	294,901	871,309	2.38
Turlock ID	1,115	4,876,881	52,107,590	28,322	452,403	251,885	704,288	1.26
Ukiah	152	802,099	9,663,386	5,282	184,234	68,888	253,122	3.08
Vernon	626	3,262,867	51,168,329	30,304	320,742	54,269	375,011	9.10
-	-	-	-	-	-	-	-	-
Summary	82,561	439,710,369	4,638,521,376	2,493,253	$87,494,781	$39,454,519	$126,949,300	2.66

Note: All data is fiscal year, except for the following calendar year utilities: IID, Merced, Modesto, Plumas Sierra, SMUD, Truckee Donner, and TID.

ALAMEDA MUNICIPAL POWER

Alameda Municipal Power (AMP)

- Established in 1887; the oldest municipal electric utility in the West
- 34,338 customers: 88 percent are residential, 12 percent commercial
- Peak demand: 67.2 megawatts (MW), occurs in the early evening in the winter
- Alameda Municipal Power (AMP) load does not have large demand spikes like most of California
- There is no residential air-conditioning and minimal industry
- FY 2012 customer energy load was 373.8 gigawatt hours (GWh)
- 91 employees

AMP Energy Efficiency Program Background

- Since 1991, AMP has spent more than $2.8 million on direct customer rebates.
- The energy efficiency programs have resulted in a demand reduction of more than 9.5 MW, 14 percent of peak demand, and energy use reduction of 30,521 MWh/yr, which is equal to 8.2 percent of annual energy use.
- AMP provides energy efficiency programs and services to all customers including free energy audits, prescriptive and customized rebates, public awareness programs, and advanced technologies.
- Pre- and post-installation inspections are done on 100 percent of the commercial rebates to ensure reliable savings.

AMP Energy Efficiency Highlights, FY 2012

The net energy efficiency savings for FY 2012 was 2,527 MWh/year, which is 151 percent of Assembly Bill (AB) 2021 target savings of 1,675 MWh/year. AB 2021 requires that all publicly owned utilities (POUs), in consultation with the State Energy Resources Conservation and Development Commission (CEC), develop an estimate of all potentially achievable, cost-effective energy efficiency savings and establish annual targets for energy efficiency savings and demand reductions over 10 years. The targets must be updated every three years.

Fiscal Year	Net MWh/yr savings	AB2021 Target Savings MWh/yr
2007	923	760
2008	2,136	760
2009	2,211	760
2010	1,326	760
2011	1,433	1,574
2012	2,527	1,675

Recently, due to the large amount of reporting required by state and federal agencies on utility investments in renewable energy and energy efficiency, the California State Legislature passed AB 2227. AB 2227

consolidates reporting and aligns energy efficiency reporting with the CEC's biennial Integrated Energy Policy Report (IEPR). Thus, in the future the establishment of annual energy efficiency targets will be done every four years, instead of three years.

The 2,527 MWh/year savings achieved is equal to the annual energy use of 568 average Alameda residential customers. The resulting annual greenhouse gas emissions reduction from the FY 2012 energy efficiency programs is 1,233 short tons of equivalent carbon dioxide (CO_2e), which is equal to the annual emissions of 219 cars.

The table below lists the AB 2021 target for the 10-year period from 2011 to 2020. The AB 2021 target was generated in 2010 from CalEERAM, a computer model, which is based upon an Excel spreadsheet that integrates energy efficiency impacts and costs, utility customer characteristics, utility load forecasts, utility avoided costs, and rate schedules.

Alameda Municipal Power – AB 2021 Energy Efficiency Targets 2011 to 2020

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Customer Load (MWh/yr) Forecast January 2010	387,400	389,600	393,600	398,500	401,500	403,200	405,000	406,900	409,100	411,800
Energy Efficiency as a percent of Load Forecast	0.41	0.43	0.45	0.46	0.47	0.48	0.485	0.487	0.488	0.489
MWh/yr Target	1,574	1,675	1,771	1,833	1,887	1,935	1,964	1,982	1,996	2,014
MWh Cumulative EE Savings	1,574	3,249	5,020	6,854	8,741	10,676	12,640	14,622	16,618	18,632

In viewing the table it is important to understand that customer loads have been decreasing since 2008. AMP's actual energy sales for FY 2012 were only 373,787 MWh, a decrease of 4 percent (15,813 MWh/year). For FY 2012 part of the energy sales decrease is due to energy efficiency - 2,527 MWh/year and 400 MWh/year, but most of this is due to the economic recession. One large commercial customer moved their manufacturing operations out of Alameda and vacancy rates for office space are relatively high.

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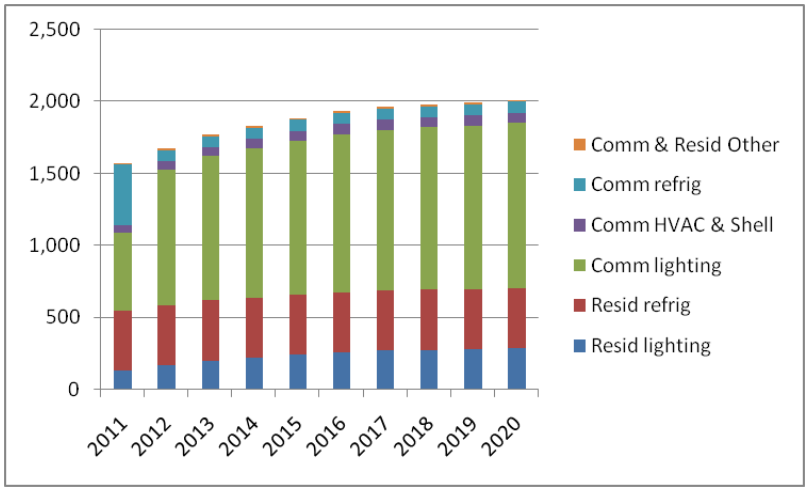
The following graph illustrates how the target will be achieved by electric end use and by customer segment over the 10-year period:

Target of Savings by End Use – AB 2021



The following table compares the projected AB 2021 energy efficiency savings for FY 2012 to the actual energy efficiency savings for FY 2012.

End Use	AB 2021 Projected (MWh/yr)	Actual Savings (MWh/yr)
Comm & Resid, Other	13	87
Comm Refrig	77	212
Comm HVAC	54	31
Comm Lighting	945	2,059
Resid Refrigeration	416	108
Resid Lighting	170	30
TOTAL	1,675	2,527

The annual actual and the projected energy efficiency will most likely vary for the following reasons.

1. Computer models, such as CalEERAM have limitations. For example, the data are dated and based upon studies completed seven to 10 years ago. The building and appliance data is disaggregated to the general climate zone level and not specific to the City of Alameda.
2. There are uncertainties regarding energy efficiency technologies and customer acceptance, such as the full marketing potential and diversity of applications of LED lighting in Alameda over the 10-year period.
3. The scope and timing of large customer projects such as the Maritime Administration ships, College of Alameda, and the shipyard Bay Ship and Yacht are difficult to predict. Energy efficiency projects with large customers can take several years to implement.
4. The time needed to start a new program is lengthy due to the contracting process and the program ramp-up time.

For FY 2012, 81 percent of the energy efficiency savings are in commercial lighting due to the success of AMP's Commercial Lighting Pilot Program.

As of July 2012, new Department of Energy regulations, which expand on the efficiency rules established by the Energy Policy Act of 1992, prohibit the manufacturing of the inefficient T12 fluorescent lamps and first generation T8 fluorescent lamps in the United States. Most California utilities will greatly reduce the rebate on T12 fluorescent lighting after July 2012 because manufacturers cannot manufacture T12 lamps after that date.

To capture these energy savings and encourage customers to retrofit their old T12 lamps before the policy change, AMP launched the Commercial Lighting Pilot Program (CLPP) in October 2011. The goal of the CLPP is to retrofit T12 fluorescent lamps with energy efficient T8 lamps and electronic ballasts, complete whole building lighting retrofits, obtain a high level of participation from small commercial customers (A1 rate), and create a contractor-driven energy efficiency program.

The rebates under the CLPP are the highest AMP has offered and to encourage small commercial participation, the program provides an incentive for contractors who complete A1 small commercial projects.

Energy efficiency is a tough sell during these volatile economic conditions and particularly difficult for small and medium businesses that typically lease their space. Small commercial customers are 94 percent of AMP's commercial accounts. The tenant pays the electric bill, but is not responsible for capital improvements to their space such as lighting and air conditioning equipment.

There will be limited opportunities for energy efficiency savings in 2013 and 2014 because of the new policy on fluorescent lighting, the continued high cost of light emitting diode (LED) lighting, and the economic situation. Staff projects AMP will be below the energy efficiency target those years and can average actual savings over a multiyear period to meet energy efficiency savings targets.

The following table summarizes the costs and benefits of AMP's energy efficiency programs for FY 2012.

Year	Rebates to Customers	Other Costs – Admin, EM&V, Marketing, etc.	Total Cost to Utility	Net Savings (MWh/yr)	*Utility Cost per kWh	TRC
2010	$115,465	$463,603	$579,068	1,326	$0.05	1.77
2011	$224,026	$429,790	$653,816	1,433	$0.06	1.46
2012	$427,182	$455,312	$882,494	2,527	$0.03	2.34

*per E3 model

The total energy efficiency expenditures for FY 2012 was $882,494, of which direct customer rebates was $427,182 and $455,312 was utility administrative, marketing, energy audits, overhead, and related costs.

For FY 2012 energy efficiency spending increased by 35 percent and the energy savings increased by 76 percent.

The total utility cost of the energy efficiency measure over the lifetime of the measure for energy efficiency for FY 2012 was $0.03/kWh. This is comparable to AMP's assumed avoided power generation cost of $0.11/kWh, a cost that includes power generation, transmission, distribution, and environmental externalities.

The Total Resource Cost (TRC) ratio for FY 2012 is 2.34 and exceeds the 1.00 threshold.

AMP completes evaluation, measurement, and verification (E, M, &V) of energy efficiency programs each year and the study is submitted every two years. EM&V has been completed and submitted for FY 2010 and 2011. The next E, M, &V study will be for FY 2012 and 2013.

Through the Northern California Power Agency (NCPA), AMP is in the process of implementing a comprehensive web-based energy efficiency data management tool. The tool will be used by many NCPA members and other municipal utilities.

Alameda is an island city and nearly 8 percent of the energy use is maritime. AMP's largest customer is the Maritime Administration (MARAD), a Department of Transportation agency with nine ships on a long-term lease. The nine cargo ships are on reserve and must be able to sail in five days to anywhere in the world.

In FY 2012 AMP provided MARAD, at no cost, a detailed energy audit of the ship Cape Orlando. The audit report included operations/maintenance measures as well as energy efficiency retrofit measures. The operations/maintenance and lighting measures have been completed on the Cape Orlando and the mechanical measures are nearly completed.

Lighting audits were done on two more ships, the Algol and the Capella, in 2012. The lighting retrofit of these two ships is expected and a mechanical system audit of the ships will be completed in FY 2013.

In FY 2012 AMP provided the following energy efficiency and low income programs:

Residential Energy Efficiency Programs

1. Energy Star Refrigerator Rebate & Recycle Program – Rebate for buying an Energy Star refrigerator and recycling the old refrigerator with our recycler.
2. 2nd Refrigerator Pick-Up Program – Rebate for customers recycling their second refrigerator with our recycler.
3. Trade-Ins for CFLs – Trade-in events where customers bring in their incandescent lights and exchange those for compact fluorescents (CFL).
4. Monitor Lending Program – Borrow a monitor to measure the energy use of appliances.
5. Onsite Energy Audits – Residential audits at no cost.
6. Weatherization Cash Grant Program – Grant for up to 80 percent of the cost of weatherizing homes with electric heat.
7. Online Energy Audit – Online residential energy audit and associated tools such as an appliance calculator and energy library on AMP's website.
8. LED/Advanced Technologies – Promote advanced technologies such as LED down lights.

9. Energy Upgrade California – AMP provided support and promotion to the statewide program, in the form of community workshops and various advertising.
10. Home Energy Report Pilot – The goal of this pilot program was to target AMP's highest tier energy users, determine customer interest in receiving detailed information on their energy use, and test customer reception to home energy reports. Customers received a monthly detailed report on their energy use and information on how to reduce it.

Low Income Programs

1. Energy Assistance Program – Provides energy audits, energy efficiency measures, and a 25 percent bill subsidy to qualifying low-income customers.
2. Energy Assistance through Supportive Efforts - Provides short-term emergency assistance based upon matching funds from the customer.

Commercial Energy Efficiency Programs

1. Commercial HVAC Retrofit Program – Prescriptive rebates for retrofitting existing buildings with energy-efficient HVAC equipment.
2. Commercial Customized Retrofit Program – Based upon the kWh/yr reduced, rebates for energy efficiency retrofits such as motors and server virtualization.
3. Keep Your Cool – A commercial refrigeration retrofit program.
4. Commercial On-Site audits – Free energy audits for lighting, HVAC, refrigeration, process systems, etc.
5. New Construction Design Assistance – Grants of up to $10,000 for energy-efficient design work.
6. New Construction Rebates – Whole building and systems rebates for energy-efficient new construction.
7. LED/Advanced Technology Program – Increased rebates to promote advanced technologies such as LED lighting.
8. Commercial Lighting Pilot Program – A contractor-driven commercial lighting retrofit program with high rebates and contractor incentives for retrofitting small commercial customers.

Alameda Municipal Power Investment in Renewables

Approximately 66 percent of AMP's electricity comes from California Energy Commission approved renewable resources including geothermal, landfill gas, wind, and small hydro. With the inclusion of large hydro, over 98 percent of AMP's resources are carbon free.

In FY 2013, a new 2 MW landfill-gas-to-energy project will come online.

Projects to extend the life and improve the efficiency of the Geysers Geothermal field are continuing. Examples of these improvements are wells to inject water to increase steam output and the addition of more efficient turbines.

Alameda – Summary of Energy Efficiency Programs, FY2012

Alameda		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling									
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	1,516	37	5	29,638	157,080	84	$11,946	$1,555	$13,501
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	350	23	23	108,279	675,340	366	$22,910	$7,351	$30,261
HVAC	Res Shell									
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	2	4	2	30,768	512,544	309	$4,241	$9,988	$14,229
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	4	547	274	2,059,048	30,283,005	16,779	$343,412	$389,005	$732,417
Process	Non-Res Motors	1	9	17	86,660	2,166,501	1,152	$9,176	$23,085	$32,261
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	1	40	20	212,422	1,486,953	784	$35,496	$24,329	$59,825
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		1,874	660	341	2,526,814	35,281,423	19,473	$427,182	$455,312	$882,494
T&D	T&D									
Total		1,874	660	341	2,526,814	35,281,423	19,473	$427,182	$455,312	$882,494

EE Program Portfolio TRC Test	**2.34**

ANAHEIM PUBLIC UTILITIES

ANAHEIM PUBLIC UTILITIES
www.anaheim.net

Anaheim Overview

- Established in 1894, the only municipal electric utility in Orange County
- 177,379 meters, 114,662 are electric and 62,717 are water
- Consumption of energy: 75% Commercial/Industrial, 24% residential and 1% miscellaneous
- Peak demand: 549 megawatts established September 2011
- Retail annual energy used: 2,379 gigawatt-hours.
- 334 full-time employees and 28 part-time employees

Overview of Public Benefit Programs

From January 1998 through June 2012, public benefits expenditures totaled $99.4 million as follows: Energy Efficiency 58%; RD&D 11%; Renewable Energy Resources 19%; Income-Qualified 7%; and Administration 4%.

Energy Efficiency programs serve every residential customer, including income-qualified (low income) customers. Residential customers who participate in Energy Efficiency Programs are not identified by income level. In actuality, there are far more income-qualified customers participating in the residential programs than the 7% reflected above.

Conservation of electricity and water is important in helping Anaheim Public Utilities defer the future purchase of costly resources. In the short-term, conservation is vital in helping maintain stable rates. Anaheim currently offers 38 Advantage Services Programs to help customers reduce electric use, conserve water and save money.

Strategic Objectives

Develop programs and services to:

- Achieve legislatively driven goals and objectives (AB 2021)
- Meet the needs of our customers and Department
- Maximize Public Benefit Investments
- Promote New Energy/Water Technologies
- Expand Renewable Energy (meet SB-1) goals
- Promote Green Buildings
- Develop effective communications and marketing plans

Current Commercial Customer Programs

Total annual program cost: $1,530,038

Resulting in: 2,026 net kilowatt demand reduction and 10,145,427 net kilowatt-hour reduction

- **Comprehensive Energy Audits -** Customized on-site audits and recommendations designed to improve energy operating efficiency and help customers reduce costs.
- **Water Use Surveys -** Expert analysis of a facility's water use, specific water saving recommendations, and an explanation how incentives may help fund improvements.

- **Economic Development/Business Retention Rate -** Provides qualifying businesses with rate discounts with an efficiency measures installation component.
- **Customized Energy Incentives -** Customized financial incentives for installation of high-efficiency air conditioning, motors, and other production related equipment.
- **Heat Pump Incentives -** Encourage installation of high-efficiency heat pumps.
- **Exit Sign 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.
- **Lighting Incentives –** Provides incentives to improve energy efficiency for a variety of lighting applications**.**
- **Small Business Energy Management Assistance -** 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.
- **New Construction -** Design assistance and incentives for new construction and facility expansions that install energy-efficient equipment that exceed Title 24.
- **Commercial Water Equipment Rebates -**Businesses and companies are eligible for rebates by installing or retrofitting with qualifying water-saving devices through the "Save a Buck" Program

Water:

- Landscape Performance
- Rotating Nozzle Rebates
- SmarTimer Rebates

Current Residential Customer Programs

Total annual Program Costs $2,002,022

Resulting in: 5,890 net kilowatt demand reduction and 12,372,309 net kilowatt-hour reduction.

- **Home Utility Check-Up -** A customized in-home survey of water and energy use and existing appliances; or an option to go to www.anaheim.net **On-Line Home Utility Check-Up** and click on Public Utilities to complete a detailed survey online. Either way, customers receive money saving advice, installation of up to five CFLs, water saving aerators and showerheads, and learn about incentives designed to help them be more water and energy efficient.
- **Home Incentives -** Rebates for purchase and installation of high efficiency ENERGY STAR® rated appliances and high efficiency conservation measures.
- **TreePower -** Provides complimentary shade trees and incentives for residential customers. Shade trees, when properly placed, can help reduce air conditioning costs.
- **Weatherization** - Provides weatherization measures, ensures combustion appliance safety and install Energy Star appliances for income-qualified residential homeowners and tenants.
- **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 CFLs to students to sell as a fund raising activity to attend outdoor environmental camp (or other specified extracurricular activity). Schools pay $1 for each bulb sold which is applied to the Sun Power for Schools Program.

- **Income-Qualified Senior or Disabled Energy Credit -** Provides a 10 percent reduction on the electric portion of bills to seniors or long-term disabled customers at or below 80 percent of the Orange County median income.
- **Refrigerator Recycling Program** – Provides a rebate to customers who recycle an old, operational refrigerator or freezer.
- **Opower –** Comparative Usage behavior pilot program with 15,000 selected residential customers. The reports include descriptions of the customer's energy use, comparisons to similar sized homes, and options to reduce energy costs.
- Air Duct Efficiency Program

Water

- Rotating nozzle rebates
- SmarTimer rebates
- Synthetic Turf

Current Procurement Expenses

Total Annual Program Expenditures $205,000
Resulting in: 308 kilowatt demand reduction.

- **Thermal Energy Storage (TES) Program** – Program provides incentives for installation of small and large scale thermal energy storage systems that permanently shift demand for electricity to provide air conditioning from peak periods to off-peak periods.

Anaheim Public Utility (APU) EM&V Efforts

APU retained the services of an independent third party contractor to evaluate its energy efficiency programs. The firm has completed assessing energy efficiency projects completed in fiscal year 2008-2009 (July 1 – June 30). Projects reviewed represent a random sampling from the full spectrum of APU's energy efficiency program portfolio. The independent third party's EM&V analysis has concluded, however, APU does not agree with the methodology used by the independent third party. As soon as the new EM&V guidelines are completed, APU will resume EM&V analysis of energy efficient programs.

Public Facilities

Energy efficient LED lighting pilots and retrofits have been implemented in the City facilities. All traffic sign lights and crosswalks have been retrofitted with LEDs.

Proposed Energy Efficiency Programs and Services 2011-12

• Expand existing programs and accelerate current levels of participation by targeted marketing campaigns, potentially increasing incentive levels
• Continue to evaluate the appropriateness of new energy efficiency technologies

Low Income

- Ensure the low-income programs adequately respond to our customer's needs
- Work closely with City Departments to ensure that all qualified customers are enrolled in the low income program

Projected Integrated Resources Program

- Provide incentives for two large scale thermal energy storage projects.

Programs funded with stimulus funds or other funding sources.

- Several programs produced additional kWh savings and kW demand reductions with no expenditure of additional Public Benefit funds.

American Reinvestment and Recovery Act (ARRA) Stimulus Funds

Energy Efficiency Conservation Block Grant Program – Funds that were expended and corresponding net energy efficiency savings and demand reductions committed in FY 11/12 are depicted in the table

Advantage Services	Program Costs	Actual Net kW Saved-E3 Model	Actual Net kWh Saved-E3 Model	Participants	Rebates/Misc. Recovery Chargs Provided
Commercial/Industrial Services					
Lighting Incentives Program	**$461,255**	**810**	**4,310,513**	**47**	**$432,854**
Lighting Incentives Program - STIMULUS	$122,730	214	976,446		$122,730
Lighting Incentives Program -Total	**$583,985**	**1,024**	**5,286,959**	**47**	**$555,584**
LED Exit Signs Program	**$4,990**	**4**	**36,650**	**7**	**$4,140**
LED Exit Signs Program - STIMULUS	$2,220	0	9,567		$2,220
LED Exit Signs Program -Total	**$7,210**	**4**	**46,217**	**7**	**$6,360**
Energy Efficient Incentives Program	**$246,817**	**230**	**2,056,249**	**29**	**$229,817**
Energy Efficient Incentives Program - STIMULUS	$26,614	5	214,562		$26,614
Energy Efficient Incentives Program - Total	**$273,431**	**235**	**2,270,811**	**29**	**$256,431**
Convention Center Lighting Retrofit	**$67,292**	**0**	**0**	**0**	**67,292**
Convention Center Lighting Retrofit - STIMULUS	$648,673	362	1,713,904	1	$648,673
Convention Center Lighting Retrofit - Total	**$715,965**	**362**	**1,713,904**	**1**	**$715,965**
Commercial/Industrial Services-Stimulus Subtotal	$800,237	581	2,914,479	1	$800,237
Total	**$1,580,591**	**930,142.7**	**930,142.7**	**930,143**	**$930,143**

Regular PBC Funds	**Bold Black Text**
Stimulus Funds	Black Text
Total of Stimulus + PBC Funds	**Red Text**

Anaheim – Summary of Energy Efficiency Programs, FY2012

Anaheim		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	1	94	94	447,446	1,342,339	799			
HVAC	Res Cooling	3	21	21	175,289	2,636,985	1,682	$19,476		$19,476
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	2	5,217	5,217	9,389,256	65,537,977	37,174	$122,107		$122,107
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	2	262	262	1,169,926	6,994,356	3,948	$49,900		$49,900
HVAC	Res Shell									
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	4	304	304	1,190,392	9,043,460	5,149	$149,306		$149,306
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	3	290	597	2,352,450	35,041,829	22,562	$445,689		$445,689
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	6	1,750	1,750	7,792,977	96,535,451	57,175	$436,994		$436,994
Process	Non-Res Motors									
Process	Non-Res Pumps	2			1,819,169	9,095,845	5,069			
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		23	7,937	8,245	24,336,905	226,228,243	133,559	$1,223,472		$1,223,472
T&D	T&D	1	155	155	1,360,000	20,400,000	11,369			
Total		24	8,092	8,400	25,696,905	246,628,243	144,928	$1,223,472		$1,223,472

EE Program Portfolio	TRC Test	**6.84**
	PAC Test	**20.74**

AZUSA LIGHT & WATER

Azusa Overview

- Established in 1898, Azusa Light & Water is one of the oldest municipal utilities in Southern California and the West.
- The utility serves approximately 15,250 retail customers, of which 69 percent of the sales are for the Commercial and Industrial consumers that account for only 12 percent of the customer base.
- Peak demand of approximately 65 megawatts usually occurs in the early evening during the late summer.
- Azusa Light & Water does not self-generate locally, and purchases 80 percent of the total 266,250 megawatt-hours through long-term contracts.
- Un-audited sales revenues are $38,100,000, with un-audited operating costs of $37,100,000.
- Electric system includes 2 substations, 20 circuits and about 100 miles of electric lines.

Azusa Light & Water Energy Efficiency Program Highlights

Since inception, Azusa Light & Water has expended over $9.5 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 reduction of approximately one percent. Savings are based upon engineering estimates and measurements that have been field verified.

Current 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.

Current Residential Customer Programs

- EnergyStar® Refrigerator Program: Rebates are offered for the purchase of an EnergyStar® rated refrigerator.
- EnergyStar® Air Conditioner Program: Rebates are offered for the purchase of an Energy Star® rated room or central air conditioning unit.
- Home Weatherization Rebate Program: Rebates are offered for a variety of home weatherization measures.

- EnergyStar® Appliance Program: Rebates are offered for most high efficicency appliances that have the EnergyStar® rating, including but not limited to, 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.
- LED TV and Computer Monitor Program: Rebates are offered for the purchase of LED TV's and computer monitors.

Public Facilities

- 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

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

Proposed Azusa Energy Efficiency Programs and Services: (for 2012-2013)

- Maintain existing programs at current levels with minor modifications
- Ensure that all new electric loads are efficient
- Evaluate the appropriateness of any new energy technologies
- Ensure that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency measures
- Measure and evaluate the impact of energy efficiency programs

Low Income Programs

- Maintain existing programs at current levels.
- Ensure that all qualified customers are enrolled in the low-income program.
- Conduct an evaluation of the low-income programs.

Azusa Investment in Renewable Energy

- Azusa Light & Water will continue to explore addition supplies of renewable energy to meet its 2017 requirement of 30 percent renewable energy in the power portfolio.

Azusa Demand Reduction Programs

- Maintain existing summer load reduction program driven by reliability considerations. Current program entails calling large customers to voluntarily conserve during Stage 2 episodes.
- Measure and evaluate additional price-driven demand response programs.

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Azusa – Summary of Energy Efficiency Program, FY 2012

Azusa		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	3			96	960	1	$3,105	$3	$3,108
HVAC	Res Cooling	2	23	23	6,548	95,971	58	$12,786	$440	$13,226
Appliances	Res Dishwashers	1			155	2,015	1	$1,276	$6	$1,282
Consumer Electronics	Res Electronics	1	4	4	10,064	90,576	51	$26,765	$277	$27,042
HVAC	Res Heating									
Lighting	Res Lighting	1	62	62	456,192	4,105,728	2,329	$4,056	$12,564	$16,620
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	3	5	5	30,614	551,045	310	$15,129	$1,801	$16,930
HVAC	Res Shell	3	24	24	68,800	1,979,194	1,252	$89,744	$11,103	$100,847
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	4	45	45	477,269	3,030,472	1,731	$309,652	$9,519	$319,171
Process	Non-Res Cooking	1	1	1	5,500	66,000	37	$2,205	$208	$2,413
HVAC	Non-Res Cooling	12	31	31	22,869	373,785	208	$92,223	$1,176	$93,399
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	31	221	221	644,705	7,139,175	3,979	$328,404	$22,326	$350,730
Process	Non-Res Motors	2		26	56,136	842,040	469	$42,684	$2,656	$45,340
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	9	55	55	419,622	4,293,416	2,393	$115,010	$13,413	$128,424
HVAC	Non-Res Shell	5	172	172	836,832	8,397,450	4,680	$278,377	$26,209	$304,586
Process	Non Res Process	1	1	1	310	3,720	2	$16,938	$12	$16,949
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		79	646	672	3,035,713	30,971,547	17,500	$1,338,353	$101,713	$1,440,066
T&D	T&D									
Total		79	646	672	3,035,713	30,971,547	17,500	$1,338,353	$101,713	$1,440,066

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

CITY OF BANNING ELECTRIC UTILITY

Banning Overview

- Established in 1922.
- 27 employees.
- Of the 11,814 customers, 90% are residential.
- Average demand during FY 11/12 was 16.5 MW, up 3.1% from the period prior.
- Peak demand during FY 11/12 was 44.3 MW, down 1.6% from the period prior.
- Peak demand is primarily due to air conditioning load during the summer.
- Retail energy sales in FY 11/12 were 135,976,788 kWh, up 4.4% from the period prior. Retail sales are broken down as 49 percent residential and 51 percent commercial/industrial/institutional.

Banning Energy Efficiency Programs

During FY 11/12, Banning spent $198,288 in Energy Efficiency programs, which have provided 39 kW demand and 93,128 kWh energy savings. 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.

Current Residential and Commercial Programs

- **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.
- **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.

Proposed Energy Efficiency Programs and Services – (2012-13)

- Work with community organizations to further increase awareness of and overall participation in existing programs.
- Ensure that all new electric load is efficient.
- Evaluate and implement new energy efficiency technologies as applicable.
- Ensure that Banning's Renewable Portfolio Standard (RPS) is maintained.

- Measure and evaluate the impact of energy efficiency programs.

Banning Investment in Renewables

The City of Banning's RPS has committed the Utility to reach 33 percent renewables by 2020.

- The City has contracted for geothermal energy from two generating facilities. Together they supply approximately 19 percent of the City's energy need.
- 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.

Banning Demand Reduction Programs

The City of Banning does not currently have any demand reduction programs in place.

Evaluation, Measurement, and Verification

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.

Banning – Summary of Energy Efficiency Program, FY2012

Banning		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	55	8	8	3,240	38,874	23	$5,000	$1,312	$6,312
HVAC	Res Cooling	53	8	17	16,944	300,632	190	$7,200	$15,202	$22,402
Appliances	Res Dishwashers	33	3	3	962	10,587	6	$2,225	$333	$2,558
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	3			507	5,073	3	$200	$145	$345
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	122	6	6	31,504	267,182	151	$13,500	$7,982	$21,482
HVAC	Res Shell	51	16	16	35,314	706,287	462	$6,100	$40,652	$46,752
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		317	42	51	88,472	1,328,634	836	$34,225	$65,625	$99,850
T&D	T&D									
Total		317	42	51	88,472	1,328,634	836	$34,225	$65,625	$99,850

EE Program Portfolio	TRC Test	**0.82**
	PAC Test	**1.80**

CITY OF BIGGS

Biggs Overview

- Biggs has 612 residential, 37 commercial, 15 municipal and 3 industrial accounts.
- The City of Biggs projects a growth rate of 1% per year.
- Peak demand – in Sept. 2011 was 4.1 MW
- Annual energy use: 17 gWh.
- Power content: Geothermal 10.8%, small hydro 1.1%, large hydro 70.5%, Unspecified 17.6%.

Biggs Energy Efficiency Programs History

The City of Biggs implemented residential demand-side management programs in 1997 but completely remodeled our programs in mid 2005. In FY 2006-2007, our program was expanded to include commercial audits, educational programs and commercial holiday lighting. In FY 2007/2008 we again expanded our commercial program to include commercial lighting, refrigeration and HVAC rebate programs. In FY 2008/2009, the city implemented the "Keep Your Cool" program for food-service customers.

Between fiscal year 2001 and fiscal year 2006, the City experienced a growth in Residential Demand-Side Management Program participation of 97% and a growth in Residential DSM rebate expenditures of 96%.

The recession of the last five years adversely affected our Residential DSM Program, resulting in a drop in participation of 87%. After a brief increase in residential participation during FY 2011, we have again seen a decrease in participation during FY 2012. 76% of our savings for this reporting period are the result of an EECBG LED Street Light Project partially funded through the American Recovery & Reinvestment Act.

Third-party Evaluation, Measurement and Verification studies performed at the close of fiscal years 2008, 2009 & 2010 confirmed an average of 97% of energy savings reported by the City of Biggs in our annual SB1037 report. Verification of demand savings averaged 96%. The City of Biggs has moved to a three year EM & V reporting period, with the next report due at the end of fiscal year 2013.

In August 2009, Biggs indicated their intent to participate in the Energy Efficiency and Conservation Block Grant Program. A joint Application for Grant Funding was executed by NCPA on behalf of Biggs, Ukiah & Healdsburg. The EECBG LED Streetlight Project was completed in January 2012.

In order to meet our demand-side management goals, Biggs is aggressively promoting commercial/industrial DSM Programs with the two largest energy consumers in town. Biggs will continue to work with SunWest Milling to move forward on a comprehensive lighting retrofit program for its warehouses and milling facilities and work with our school district to install additional energy efficiency measures. The city will further investigate funding opportunities to continue our LED Street Lighting Project, with the goal of retrofitting 100% of the city's street lighting in the next 3 years.

Current Demand-side Management Programs and Services

- ***Commercial Energy Audits*:** The City of Biggs offers free, customized commercial energy audits, including lighting assessment, HVAC assessment, equipment assessment and a review of energy

usage. Specific recommendations to improve energy efficiency and reduce energy use are provided.

- ***Commercial Energy Rebate Program:*** The City of Biggs offers customized demand-side management incentive programs to commercial and industrial customers, focusing on peak load reduction and energy savings. Generous rebates and comprehensive technical support are available to customers to promote the installation of energy efficient lighting, HVAC, refrigeration, equipment and controls.
- ***Residential Energy Rebate Program:*** The City of Biggs manages a comprehensive residential demand-side management incentive program, focusing on peak load reduction and energy savings. Generous rebates are available to residential customers for weatherization measures such as attic/wall insulation, dual pane windows, shade screens, radiant barriers and cool roof products. Biggs offers rebates for measures which reduce summer cooling load such as high efficiency HVAC, whole house fans and attic fans. Biggs also offers rebates for Energy Star refrigerators and lighting controls.
- ***Residential Energy Audits:*** The City of Biggs offers free residential energy audits, including insulation assessment, HVAC assessment, weatherization assessment and a review of energy usage. Specific recommendations to improve energy efficiency and reduce energy use are provided.

Biggs – Summary of Energy Efficiency Program, FY2012

Biggs		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling	3		1	236	4,257	3	$600	$448	$1,048
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting									
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	6			2,076	16,515	9	$600	$886	$1,486
HVAC	Res Shell	2			231	4,620	3	$179	$435	$614
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling									
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	50	3		12,669	152,028	79	$6,064	$6,851	$12,915
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		61	4	1	15,213	177,420	93	$7,443	$8,619	$16,062
T&D	T&D									
Total		61	4	1	15,213	177,420	93	$7,443	$8,619	$16,062
EE Program Portfolio TRC Test		0.75								

BURBANK WATER & POWER

Burbank Overview

- Burbank Water and Power (BWP) was established in 1913
- BBWP currently serves electricity and water to over 100,000 residents and 6,000 businesses located in the City of Burbank.
- During Fiscal Year (FY) 2011-12, BWP's electric load was about 1,123,000 megawatt-hours (MWh)
- Peak demand hit a system high of 305 megawatts (MW) on September 7, 2011.
- BWP has about 330 employees, including nine in the Marketing and Conservation group.

Goals

During FY 2011-12, BWP spent $3.8 million on energy efficiency programs. These programs resulted in actual annual energy savings of 12,360 MWh and actual peak demand savings of 5.0 (megawatts) MW. After the incorporation of net-to-gross ratios, the net annual energy savings totaled more than 10,950 MWh and the net peak demand savings amounted to 4.4 MW.

BWP's FY 2011-12 goals were to reduce energy usage by one percent, with specific goals of 11,230 MWh and 3.0 MW. Against these goals, BWP attained 110 percent of the actual energy goal and 155 percent of the actual peak demand goal. Despite BWP's achievements in FY 2011-12, energy savings are highly dependent on market conditions and are not easily replicated from year to year.

BWP's FY 2012-13 budget has about $4.0 million, designated for energy efficiency programs. BWP has established our internal savings target at one percent, which is in line with the Navigant target setting process. Navigant derived an average annual 0.89 percent savings target for the period of 2014-2023. BWP anticipates continued achievement of these goals during the current fiscal year based on the expansion of the Home Energy Reports program and service additions to the Green Home House Call program.

BWP annually provides the Burbank City Council a written report and presentation on its program results and efficiency targets. The most recent presentation was in June 2012. The Council had a very positive reaction and continues to endorse our portfolio of efficiency programs for residents and businesses.

Overall Portfolio Strategy

BWP's energy efficiency portfolio has been designed to reflect our organizational goal of providing sustainable, affordable, and reliable service to our residents and businesses.

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. While our geographic footprint is small, our residential customers are all over the map, ranging from higher income professionals to middle class families to low income seniors. There is no typical Burbank resident, which makes it challenging and interesting to design and implement programs that will have universal appeal.

For residents, we designed our Green Home House Call program to be the first stop toward a lower energy bill and carbon footprint. The program includes services that target all major end uses, including lighting, HVAC, and the building shell. Once a resident's home is insulated and tightly sealed, we direct that customer to our Home Rewards Rebates program which provides incentives for energy efficient appliances and other products. We then offer additional programs, which serve specific customer niches, including programs to dispose of inefficient second refrigerators and reduce cooling costs through shade trees. For the resident that has everything, we offer the ability to view their daily and hourly energy consumption and reduce their use through behavioral changes.

For small businesses, BWP designed the Business Bucks program, which offers a free assessment of their facility's energy use, along with up to $2,000 in direct install upgrades for lighting, HVAC, and other end uses that can be tailored to the customer sector. For businesses that have used their $2,000 allowance, or for large businesses, we offer the Energy Solutions program, which provides a rebate of five cents per kWh saved, or up to 25% of the project cost for custom projects. These project designs are based on best practice and help contribute to consistent and stable savings.

In addition, we strive to minimize costs to our residents, businesses, and to BWP operations. For FY 11-12, the benefit cost ratio for our portfolio of programs is 4.02, which means that for every dollar BWP spends on energy efficiency programs, we avoid nearly four dollars in purchased energy. Furthermore, the total resource cost (TRC) test, the primary metric used by utilities throughout the country that combines both the utility and the participant perspective, shows a benefit cost ratio of 1.76.
At the same time, BWP has designed these programs to help contribute to our goals related to energy efficiency, demand response, and greenhouse gas emissions reductions and compliance with AB 32.

New and Modified Programs

- Home Energy Reports: BWP implemented its Home Energy Reports program, utilizing Opower, in April 2011. The program combines behavioral science techniques and experimental design to produce cost-effective energy savings. In the first year of this program, each Burbank household in a 25,000 household "test" group receives a bimonthly home energy report that details its energy consumption compared to a peer group in the service territory and provides recommendations of efficiency measures. The comparison with the peer group spurs the household to reduce their consumption, either through behavioral changes or the installation of these measures.

  In order to produce a robust savings estimate, Opower compares the consumption from the test group with a 20,000 household "control" group, containing households that did not receive a home energy report. Studies of similar programs have shown energy savings between one and three percent, with an annual cost of about $20, per participating household.

  In year two of the program, which occurs in FY 2012-13, the control group begins to receive the report, allowing each Burbank residence to receive and react to a home energy report over the program lifetime. Since the program began at the end of FY 2010-11, savings are included as part of FY 2011-12 in order to produce an annualized estimate.

- Green Home House Call: In November 2009, BWP implemented a whole house direct install energy efficiency program, Green Home House Call. BWP selected KEMA as the implementation

contractor and partnered with the Southern California Gas Company and the Metropolitan Water District of Southern California to leverage additional funding. The program has several components, all provided at no charge to participants. These include an in-home audit with energy and water education, CFL and LED lamps and installations, 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 2011-12, BWP installed measures in more than 830 households, with an average savings of nearly 1,000 kWh per household. In addition, BWP expanded its partnership with the Southern California Gas Company to provide even more extensive services for residents, including for income-qualified households.

In FY 2011-12, BWP added central air conditioning tune-ups to the program, which resulted in service visits to more than 530 homes. In FY 2012-13, BWP added air sealing services to the program. Through FY 2011-12, the program has served nearly 3,000 households, or about seven percent of all Burbank households, after just three 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.

- CEIVA: In June 2012, BWP received City Council approval to implement a unique residential marketing pilot program. BWP has partnered with a Burbank-based company, CEIVA, a manufacturer and developer of digital photo frames. For a select group of 50 residents, BWP will provide a free digital photo frame that will not only show the household's personal photos, but will also be able to display the household's energy and water usage as well as marketing program information. For example, a resident might see that their electric usage has increased over the last few weeks and then see information about BWP's Home Rewards Rebates program. In addition, the display will also be able to show alerts, if necessary, such as City advisories and earthquake and weather alerts.

Current Customer Programs

Below are descriptions and updates of BWP's existing efficiency programs:

Residential Sector

- Home Rewards Rebates: For residential customers, energy efficient products have higher upfront costs than standard efficiency products (even if the operating costs are lower). The Home Rewards rebate program seeks to minimize these costs by offering rebates to residents who purchase and install ENERGY STAR appliances and other high efficiency products. The rebate amounts are typically in the range of 25 to 75 percent of the incremental cost. Higher rebate amounts are available for customers if the product was purchased in Burbank. The most common products are refrigerators, clothes washers, dishwashers, central and room air conditioners as well as building envelope measures such as insulation and low-e windows. In FY 2011-12, BWP provided more than 2,400 rebates to about 2,050 customers.

- Refrigerator Round-Up: The Refrigerator Round-Up program targets residential customers' second refrigerators, typically found in garages. These second refrigerators are more a convenience than a necessity and, because they have been operating for 10 or more years, are inefficient and could be costing the customer up to $150 annually on their energy bill. BWP arranges with Appliance Recycling Centers of America (ARCA) to have the working refrigerator picked up and environmentally recycled and provides the customer with a $100 bill credit. In FY 2011-12, BWP retired about 260 refrigerators.
- Refrigerator Exchange: This is similar to the Round-Up program, except that it targets low income customers' primary refrigerators. The old, inefficient refrigerator is picked up and recycled by ARCA and replaced with a new ENERGY STAR refrigerator. The only participation requirements are that the customer meets a certain income guideline and that the refrigerator is at least ten years old. In FY 2011-12, BWP replaced nearly 160 refrigerators.
- Compact Fluorescent Light (CFL) Distributions: CFLs use about one-third to one-fourth of the energy used by traditional incandescent light bulbs and have a lifetime about six times longer. However, customers often object to CFLs' higher upfront costs and different light quality. In order to overcome these barriers, BWP provides free, high-quality CFLs to attendees at local events as well as to participants in the Refrigerator Round-Up and Refrigerator Exchange programs. As incandescent lamps are phased out and CFLs become the efficiency standard, BWP has begun to include light-emitting diode (LED) lamps in pilot programs and provide residents with samples of this newer, more efficient lighting technology. In FY 2011-12, BWP provided customers with nearly 1,100 free CFLs and more than 750 free LEDs.
- Made in the Shade: The purpose of the program is to provide shading for residential and commercial buildings, and thereby reduce the need for air conditioning. Through this program, residents can receive up to three, and businesses up to 20, shade trees selected by the customer and delivered to them for free. The installation of the trees is done at the customer's expense, though the installation is verified by BWP's contracted arborist. In FY 2011-12, BWP provided customers with more than 300 trees.
- LivingWise: LivingWise is an educational and residential savings program for Burbank Unified School District 6th grade students. LivingWise combines classroom learning, a home audit, and minor retrofits completed by students and parents. Annually, about 1,200 students receive a LivingWise kit containing energy and water saving devices in their home. The program contractor, Resource Action Programs, compiles the savings estimates based on reporting from the students.

Commercial Sector

- Energy Solutions: BWP offers custom and prescriptive rebates to businesses who replace existing equipment with high efficiency equipment. A business can receive incentives based on either five cents per kWh saved or 25 percent of the project cost, up to an annual maximum of $100,000. In addition, businesses can receive specific incentives for efficient HVAC systems, motors, and other equipment. Any business is eligible to participate and the program is typically BWP's largest in terms of energy savings. In FY 2011-12, the program had nearly 30 unique participants who implemented nearly 60 projects.
- Business Bucks: The majority of Burbank's 6,000 businesses are small companies whose owners and managers often lack both the time and expertise to better manage their utility usage and costs. The Business Bucks program was specifically designed for this hard-to-reach market providing free audits of the facility's energy use and up to $2,000 in equipment and installation costs. The most

common measure types include lighting, HVAC (cooling), and refrigeration. In FY 2011-12, BWP provided about 430 small businesses with an average of $1,000 in free energy efficiency upgrades. Since the program's inception, BWP has provided audit and installation services to more than one-third of all Burbank's businesses.

- Air Conditioning Tune-Ups: Air conditioning is a necessity in the warm Southern California climate, and makes up about 10 to 15 percent of BWP's total residential and commercial load. However, at least two-thirds of central air conditioner systems provide cooling at less than their rated efficiency, even among new equipment. This is due primarily to incorrect refrigerant charge, low evaporative coil airflow, and/or leaky duct systems. This program offers incentives to contractors who become certified program technicians. The certified technicians utilize special software that correctly identifies an air conditioning unit's efficiency and the technicians receive incentives when the unit operates at the highest efficiency possible. In FY 2011-12, the program served about 800 residential and more than 70 commercial customers.
- Ice Bears: 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 during peak hours. By connecting to an Ice Bear unit, the air conditioning unit's compressor can be turned off for several hours without any loss of cooling to the building. Each Ice Bear unit shifts about seven kW of on-peak energy use to off-peak hours, and also provides some energy savings. In FY 2011-12, the units provided about 350 kW of peak demand capacity reduction.
- Leadership in Energy and Environmental Design (LEED) Certification Incentives: BWP provides this incentive program to encourage the new construction of resource efficient buildings in Burbank. In FY 2011-12, the program provided $25,000 in rebate funding for one LEED Gold certified project in Burbank.
- Energy Saved through Water Conservation Efforts: BWP provides water services to 26,000 customers, and has an annual goal to reduce water consumption by 1%, or about 60 million gallons. In FY 2011-12, BWP estimated savings from its water conservation programs to be 51 million gallons. BWP relies on local groundwater for nearly half of its water resources needs and supplies electricity to its municipal pumping system. Because reduced water demand leads to less electricity consumed, BWP can save energy through its water conservation program. This concept is known as the embedded energy of water. BWP estimates net energy savings of 0.36 kWh for every hundred cubic feet of water (748 gallons) conserved. This resulted in about 25,000 kWh savings indirectly flowing from our water conservation programs.

ARRA and Other Stimulus Funded Programs

To augment existing funds, BWP utilizes grant funding for a variety of operational and energy efficiency projects. Below are some relevant projects:

- Smart Grid Investment Grant: In December 2009, BWP received a four year, $20 million grant for a city-wide Smart Grid initiative. The program includes deployment of a comprehensive, secure integration of multiple, intelligent Smart Grid infrastructure systems and control processes designed to accelerate the modernization and address the challenges of the local grid. The project addresses all aspects of utility operations, with a portion of the grant set aside for Customer Smart Choice programs. As part of this, BWP introduced a customer web portal in July 2012 which integrates with the Home Energy Reports and allows our residents to view their daily and hourly

energy usage. BWP will likely implement additional retail programs using this funding in FY 2012-13.

- Energy Efficiency Community Block Grant (EECBG): Burbank Water and Power was awarded an ARRA EECBG of $1.1 million in support of a renewable energy project. The project design specified a 263 kW solar photovoltaic carport on our campus, bordering a heavily used thoroughfare. The purpose of this project was to demonstrate how architecturally appealing solar installations can be, while producing a significant amount of renewable energy. This project supports BWP's LEED Platinum application for campus-wide improvements. The solar carport was completed in August 2011 and in FY 2011-12 generated more than 300,000 kWh, offsetting 30% of annual energy usage by BWP's Administration building.

Evaluation, Measurement, and Verification (EM&V) Efforts and Plan

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.

In 2010, Lincus Energy completed an EM&V study of BWP's FY 2008-09 program savings. The Lincus study is available on the CMUA website, and BWP will continue to make EM&V reports available to the CEC and other parties.

BWP plans to continue third-party EM&V work, focusing on programs that produce the greatest energy savings. BWP's plan is to evaluate at least one significant program annually.

In addition, below are elements of BWP's internal EM&V process:

- Home Rewards Rebates – Each application requires a receipt of the purchased products. BWP's Program Managers verify the products against the ENERGY STAR website to ensure that the specifications are met.
- Refrigerator Round-Up and Refrigerator Exchange – For both programs, BWP relies on the implementation contractor, ARCA, to verify information related to the refrigerator being replaced.
- Made in the Shade – The program arborist verifies that the shade trees have been planted.
- Energy Solutions – All rebate installations are verified by BWP's Key Account Representatives, who are trained in electrical engineering.
- Business Bucks – The program contractor, RHA, conducts a pre-installation audit and verifies all installed measures.
- Air Conditioning Tune-Ups – The program uses Proctor Engineering Group's "CheckMe" software. Incentives are paid to air conditioning contractors only for items that are verified by Proctor.

Summary

BWP remains committed to providing our residents and businesses with sustainable, reliable, and affordable services. Concurrently, BWP is making significant efforts to reduce consumption of both electricity and water in line with the state's environmental goals.

Burbank – Summary of Energy Efficiency Program, FY2012

Burbank		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	582	79	79	30,671	368,057	219	$56,850	$2,139	$58,989
HVAC	Res Cooling	9,576	1,199	1,051	802,731	7,654,650	4,863	$481,267	$120,299	$601,567
Appliances	Res Dishwashers	467	39	39	11,470	126,165	75	$33,875	$689	$34,564
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	5,497	134	24	131,991	912,380	518	$43,041	$30,131	$73,171
Pool Pump	Res Pool Pump	22	1	1	5,650	56,496	32	$1,700	$304	$2,004
Refrigeration	Res Refrigeration	1,063	65	65	287,337	2,543,568	1,436	$204,555	$34,097	$238,651
HVAC	Res Shell	1,531	164	164	2,172,919	7,992,887	5,097	$941,620	$76,385	$1,018,005
Water Heating	Res Water Heating	2,416			12,049	112,498	65	$18,120	$4,196	$22,316
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	4,052	1,795	1,748	2,736,522	39,067,249	24,801	$400,294	$388,703	$788,998
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	2	1,095	1,095	3,353,016	34,490,653	20,428	$459,014	$235,263	$694,277
Process	Non-Res Motors	1		44	615,607	9,234,108	5,146	$34,017	$46,532	$80,550
Process	Non-Res Pumps	1			24,719	173,716	97	$43,897	$813	$44,710
Refrigeration	Non-Res Refrigeration	158	63	63	321,478	1,427,899	796	$41,819	$10,786	$52,605
HVAC	Non-Res Shell	4	11	11	445,789	6,398,488	3,886	$34,965	$44,680	$79,645
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		25,372	4,645	4,386	10,951,949	110,558,813	67,458	$2,795,035	$995,016	$3,790,051
T&D	T&D									
Total		25,372	4,645	4,386	10,951,949	110,558,813	67,458	$2,795,035	$995,016	$3,790,051

EE Program Portfolio	TRC Test	**1.76**
	PAC Test	**4.02**

COLTON ELECTRIC UTILITY

City of Colton
ELECTRIC UTILITY

Colton Overview

- Colton Electric Utility was established in 1895 by the City of Colton
- CEU has four substations and owns a 43-megawatt gas combustion turbine generator
- CEU has 18,834 electric system customers, 85 percent are residential
- Retail Energy sales for FY11/12 were 345,084,100 kWh, an increase of 1.5% from the previous year.
- Peak demand for 2012 was 82.3, 4.3% less than the previous year.
- As of June 30, 2012 CEU had 42 employees

Colton Energy Efficiency Program Highlights

During FY 2011/2012, Colton Electric utility spent $81,580 on energy efficiency programs, which provided 60 kW of demand savings and 419,868 kWh in energy savings.

Customer Programs for FY 2011/2012

- *Refrigerator Replacement Program:* CEU 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 $180.00
- *Low Income Assistance Program:* Income qualified residents who meet the federal low income requirements may be eligible to receive credit of one month's electric portion of their utility bill up to $150, once per fiscal year.
- *Medical Baseline Billing:* Residents with qualifying medical diagnoses may be eligible to receive an adjustment to increase the baseline kilowatt hours on their utility bill. The baseline is increased so that kilowatt hours that are used for life sustaining medical equipment are charged at the lowest tier.
- *Home Energy Audit:* Customers with extremely high energy consumption over several months are eligible for a free home energy audit. Utility staff will walk through residential properties with the home owner to identify ways to conserve on energy.
- *Lighting and Equipment Upgrade Rebates:* Commercial and Industrial buildings can benefit from monetary rebates given for kWh savings by improving lighting and equipment through energy efficient retrofits.

New Proposed Customer Programs for FY 2012/2013

- *Home Energy Audit:* Customers with extremely high energy consumption over several months are eligible for a free home energy audit. Utility staff will coordinate with a third party vendor to complete a full residential home energy audit and will provide a report to the customer regarding energy efficient upgrades as well as available rebates.
- *Commercial-Residential AC Tune-up:* Customers will be able to have their AC systems cleaned, filters replaced and coolant level checked prior to the beginning of the 2013 heating season at little or no cost.
- *Small Business Energy Audit:* Small businesses with extremely high energy consumption over several months are eligible for a free small business energy audit. Utility staff will coordinate with a

third party vendor to complete a full energy audit and will provide a report to the customer regarding energy efficient upgrades as well as any available rebates.

- *Residential Efficiency Measure Rebates:* Customers can get a monetary rebate for installing energy star rated and energy efficient measures throughout their homes. Items that qualify for rebates include; solar attic fans, whole house fans, pool pumps, window air conditioners, ceiling fans, and occupancy sensors.
- *Residential Air Conditioning Rebates:* Customers can get a monetary rebate for replacing 11 SEER and under rated packaged air conditioning units, with new units rated at 15 SEER and above.

Colton Demand Reduction Programs

CEU currently does not have any demand reduction programs in place. We are considering potential rate reductions for time of use load shifting.

Evaluation, Measurement and Verification Activities

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

Colton – Summary of Energy Efficiency Program, FY2012

Colton		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
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	94	13	13	60,484	302,422	171	$52,450		$52,450
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	62	47	359,384	3,953,225	2,341	$29,130		$29,130
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		96	75	60	419,868	4,255,646	2,512	$81,580		$81,580
T&D	T&D									
Total		96	75	60	419,868	4,255,646	2,512	$81,580		$81,580

EE Program Portfolio	TRC Test	**6.08**
	PAC Test	**5.64**

CORONA DEPARTMENT OF WATER & POWER

Corona Overview

- Electric utility was established in 2001 to provide safe reliable and cost-effective service to retail customers through bundled and unbundled generation services.
- In 2012 energy sales were 142,500 MWh and the peak demand was 26.1 megawatts
- Ninety-seven percent of energy sales were to non-residential customers.
- All bundled customers' facilities are less than 10 years old, occupying buildings that meet Title 24 requirements. This results in lower energy efficiency potential.
- DWP's self-defined mission is to "protect public health" by providing the highest quality electric service.

Corona Energy Efficiency Program Highlights

Energy Efficiency Program Goals:

- Provide information and analysis to increase customer awareness of energy efficiency that allow them to make informed decisions about reducing energy consumption and load requirements.
- Prioritize energy efficiency technologies and opportunities.
- Provide financial assistance to qualified customers to implement cost-effective and approved energy efficiencies.
- Measure and evaluate the impact of energy efficiency programs.
- Ensure that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency.

Commercial Customer Programs:

- Solar Rebate Program: The maximum commercial rebate amount in 2011 was $46,500 ($1.86/W) and the maximum commercial rebate amount in 2012 was $38,250 ($1.53/W). DWP did not receive any requests for solar rebates in FY10/11.
- Energy Efficiency Technical Support Effort: DWP offers technical support to facilitate installation and operation of air conditioning and lighting controls for commercial customers. DWP performed 4 energy audits in FY11/12. Rebates are available for energy efficiency upgrades identified in these audits. Verification services to ensure appropriate installation of recommended measures are also provided.

Residential Customer Programs:

- Solar Rebate Program: Maximum residential rebate amount in 2011 was $5,580 ($1.86/W) and $4,590 ($1.53/W) in 2012. DWP did not receive any requests for solar rebates in FY11/12.
- Residential High Efficiency Washer Rebate Program: Rebates are provided to customers who purchase and install Energy Star® clothes washing machines. DWP provided 421 rebates in FY11/12.
- Energy Efficiency Technical Support Effort: DWP offers technical support to identify energy savings opportunities for residential customers. DWP performed 4 energy audits in FY11/12. Rebates are available for energy efficiency upgrades identified in these audits.

- Energy Efficiency Kits: DWP offers energy efficiency kits to all residential customers. These kits included 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. DWP residential customers received 381 energy efficiency kits in FY11/12.

Current Education Programs:

- Energy Usage and Demand Analysis Effort: Analyze commercial customer energy usage and demand in order to facilitate customer efficiency measures and demand-side management.

Proposed Energy Efficiency Projects and Services (2012-2013):

- DWP will continue to offer its existing programs at current funding levels. It will also explore ways to expand and increase the effectiveness of the existing energy efficiency programs.

Demand Reduction Programs:

- DWP does not currently offer a rate-based demand reduction program. DWP does operate multiple municipal facilities that can be interrupted for several hours per day, when needed.

Corona – Summary of Energy Efficiency Program, FY2012

Corona		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
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	4			4,060		2		$8,334	$8,334
SubTotal		4			4,060		2		$8,334	$8,334
T&D	T&D									
Total		4			4,060		2		$8,334	$8,334
EE Program Portfolio TRC Test		2.57								

GLENDALE WATER & POWER

Glendale Overview

Glendale *Water & Power* has achieved several milestones toward strengthening the very core of its operations by building, improving, and maintaining its internal and external framework. The utility is one of only a handful of public utilities in the nation to implement water and electric digital meters simultaneously, leading to a modernized electric grid and water system that will strengthen the utility's ability to meet demand, maintain reliability and efficiency, save water, and increase the amount of renewable energy, which also paves the way for new and innovative customer programs that help customers save money and conserve.

Glendale Water & Power manages an electric service territory with over 85,000 customer meters and an all time peak load of 343 MW. Glendale Water & Power owns and operates a local natural gas and landfill gas fired generation plant with a nameplate capacity of 287 MW and also owns or has power purchase agreements for a 40 MW share of Magnolia Power Plant, a 20 MW share of Hoover Dam generation, a 36 MW share of Intermountain Power Project, a 10 MW share of Palo Verde Nuclear Generating Station, a 20 MW share of San Juan Unit 3, a 10 MW share of Tieton Hydroelectric Plant, and approximately 30 MW from other power sources, including renewable resources.

Approximately 20 percent of GWP retail sales are supplied by renewable resources. This diverse renewable resource mix includes wind, geothermal, local landfill gas, solar and small hydroelectric. In December 2012, the Glendale City Council called for GWP to meet compliance obligations as required by California statute (SBX1 2) with the goal to ultimately reach 33 percent renewable by 2020. GWP partially owns transmission in the WECC and has long term contracts on various transmission lines in the LADWP transmission grid. To reduce current load requirements and offset increased future supply needs, GWP has made significant investments in energy efficiency through its public benefit programs and in customer owned photovoltaic generation through an incentive program.

Glendale City Grid Modernization Initiative

The CEC supports the adoption of new technologies to support automated load control, demand response, dynamic rates, and other grid modernization technologies that will enable programs to reduce electricity load in the State. The adoption of these technologies is nearly ubiquitous among the California IOU's and is gaining in adoption among public power agencies as a result of successful implementations which have served as models for others to follow. This is particularly true in municipal utility service territories.

Glendale Water & Power was selected by the U.S. Department of Energy for a $20 million grant in April 2009. The utility was 1 of 33 public power utilities to be selected. Additionally, GWP was selected by the CEC to receive a $1 million Public Interest Energy and Research (PIER) grant. The total value of the Glendale electric grid modernization initiative is over $70 million. Glendale Water & Power began the project in August 2009 and completed the installation of 85,000 electric and 33,000 water meters in September 2011. Glendale Water & Power is perhaps one of only a handful of public utilities in the nation to implement water and electric digital meters simultaneously. Since project conception in August 2009 through present GWP has installed a wide area communications Backhaul network, Meter Data Management System and 1.27 MW of Thermal Energy Storage. One of the goals of the Glendale - grid

modernization initiative is to serve as a model for other municipal utilities to follow in the state and across the nation. The remainder of the project will be completed over the next three years will include an Outage Management System/Demand Management System, Enterprise Service Bus, a Home Area Network, web-portal for electric and water usage presentment, experimental rate options and a Plug-In Electric Vehicle program.

Glendale Water & Power defines the modern electric grid as an electric system that:

- Will enable active participation by consumers. The modern electric grid will provide the tools necessary to transform our customers into informed, involved, and active consumers. These tools will include access to in home displays, web portals, demand response, electric vehicles, and distributed energy resource options.
- Will accommodate all generation and storage options. The modern grid will integrate new sources of electrical generation, electric vehicles, and storage systems using simplified interconnection processes and universal interoperability standards to support a "plug-and-play" level of convenience.
- Will enable new products, services, and markets. It will support a new mature, well-integrated wholesale market as the market grows to meet the needs for our customers.
- Will optimize asset utilization and operate efficiently. The modern electric grid system will greatly expand data acquisition and data sharing across business units with an eye toward improving load factors, 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.
- Will anticipate and respond to system disturbances. The modernized electric grid will heal itself by automatically detecting and responding to problems thereby minimizing adverse impacts on customers.
- Will operate resiliently against attack and natural disaster. Glendale's initiative will incorporate the latest in cyber security standards to make the system resilient to attack and natural disasters and provide for rapid restoration capabilities.

The Grid Modernization Initiative will have the following infrastructure and functionality:

- Digital meters with large data storage capabilities and two-way communications hardware and software:
    - Electric meters with remotely-controllable switches to allow for remote service disconnect and re-connect
    - Water meters with leak detection and tamper alarm functionality.
- A wide area network to allow two-way communications between the utility and each meter in its service territory.
- A communications backbone for distribution automation, direct load control, distributed generation, demand response, and new customer directed programs and service options that allow customers to take control of energy and water costs through access to real or near real time consumption information.
- Meter Data Management System to integrate meter data with the utility's billing, customer information system, outage management, load control systems, and other digital systems.
- A premise gateway that communicates to a Home Area Network (HAN) to promote demand response, energy and water conservation, and dynamic pricing options.

- New innovative energy efficiency, load management, and demand response programs based on critical peak pricing, time of use, and dynamic pricing programs.
- Deployment and integration of distributed resources and generation, including renewable resources.
- Development and incorporation of demand response, demand-side resources, and energy-efficiency resources.
- Deployment of near real-time, automated, interactive technologies that optimize the physical operation of 'smart' appliances and consumer devices) for metering, communications concerning grid operations and status, and distribution automation.
- Deployment and integration of advanced electricity storage and peak-shaving technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air conditioning.

Additionally, the Grid Modernization Initiative will provide for:

- Improve reliability, security, and efficiency of the electric grid by increased use of digital information and controls technology.
- Dynamic optimization of grid operations and resources, with full cyber-security.

New Programs – FY 2012-2013

- **CEIVA Energy In- Home Displays:** GWP has partnered with CEIVA Energy, LLC to provide a unique In-Home Display (IHD) solution to residential and small business 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 is SEP 1.1 compliant and 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, via the IHD by pushing energy efficiency program, conservation and event messages directly to the IHD. GWP is currently piloting 100 IHD's over the next nine months to a broad cross section of residential and small business customers. GWP plans to use data collected from the pilot to develop a utility wide program
- **OPOWER Web Portal:** GWP partnered with OPOWER to provide Home Energy Reports to 75,000 residential customers and has provided customers with web-access to electric usage information for their digital meters. The Home Energy Reporting system is a proprietary technology platform that integrates usage data with an array of third-party housing, GIS, and demographic data to derive personalized insights about customers and their energy use. 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. Currently, the program is integrating the hourly interval usage data in addition to a wealth of external data sources to educate customers on how they can save energy. 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.
- **Mobile My Connect:** During 2013, GWP plans to offer an application for mobile phones and tablets that will provide energy consumption data and additional features such as location-aware efficiency shopping lists, mobile home audit guides, energy efficiency how-to videos intended as

on-the-job guides, and integrated mobile bill pay. The mobile application will also integrate with OPOWER social features and device controls such as our behavioral thermostat solution.

- **Smart Thermostats:** Beginning in 2013, GWP plans to pilot smart thermostats with its residential customers. These thermostats will be networked and connected so customers can adjust or program them from their computer or smart phone, monitor how much energy is being used and respond to power shortages should they occur. With heating and cooling accounting for approximately 50% of the average household energy bill, smart thermostats can make a noticeable difference by helping customers reduce their energy consumption.
- **Ring-O-Rang:** Starting in March 2013, GWP will pilot an online interactive social platform to educate customers on energy efficiency and water conservation behaviors and drive participation in various energy efficiency programs. The ultimate goal is to measurably empower customers with the knowledge and tools they need to reduce their electric and water bills. The vendor will customize a solution, utilizing a game technology to engage GWP's customers (up to 50,000 customers) repeatedly over a proposed six-month period in a fun, incentivized and relevant experience across their internet connected devices. The main objective will be to measurably increase customers' awareness and retained knowledge of energy efficiency, water conservation and Grid Modernization programs. At the end of the pilot, GWP will assess the effectiveness and scalability of the platform with the intent of developing an ongoing program.
- **Green Button:** Green Button is an industry-led effort that responds to a White House call-to-action: provide electricity customers with easy access to their energy usage data in a consumer-friendly and computer-friendly format via a "Green Button" on electric utilities' website. Green Button is based on a common technical standard developed in collaboration with a public-private partnership supported by the Commerce Department's National Institute of Standards and Technology. Voluntary adoption of a consensus standard by utilities across the Nation allows software developers and other entrepreneurs to leverage a sufficiently large market to support the creation of innovative applications that can help consumers make the most of their energy usage information.
- **Business Analytics:** This program will provide a web based energy management tool for our business customers. Business Analytics is a web solution energy management tool perfect for commercial building managers with more time to dedicate to energy management, engaging customers with contextualized insights and recommendations, in addition to providing opportunity for operational change.
- **Rate Engine:** Starting in April 2013 customers will have the ability to explore the potential pricing benefits of new innovative rate options and see how making small adjustments to their energy usage patterns can lower bills. Through the OPOWER and the GWP web portal, customers can model their interval energy usage data to see if moving to time of use or other rate option will save them money. Customers will be able to view their existing rate and the new rates they are eligible for, as well as see an estimate of the monthly cost of each rate plus a brief summary of the rate and the projected savings opportunity of each rate.
- **Coupons:** During 2013, Opower will develop a coupon that will include a utility-funded rebate and/or a third party-funded discount on the purchase of one or more energy efficient products. The coupon will be sent as a module printed on a Home Energy Report to up to 50,000 designated customers at a rate of 2 coupons per household.

Progress Towards AB 2021 Targets
GWP has set a minimum energy efficiency target equal to approximately 1.0 percent of annual retail sales, and reported such to the CEC along with other public owned utilities in the June 2007 CMUA AB 2021 report, and renewed its 1.0 percent energy savings commitment in the March 2010 CMUA SB1037 report. The GWP cumulative MWH goal for June 2012 was 67,809. In FY 11-12, GWP saved 13,518 MWH, bringing our FY 11-12 cumulative energy savings to 75,277 MWH, which exceeded our cumulative energy savings goal by 7,468 MWH. It should be noted that GWP's retail sales in FY 11-12 were 1,094,194 MWH, which was significantly below the sales projection of 1,152,000 MWH used to set out energy savings goal for FY 11-12 in the March 2012 CMUA SB1037 report. As such, the incremental energy savings of 13,518 MWH equates to 1.23% of FY 11-12 retail sales.

Demand Side Management Program Highlights
Glendale Water & Power is a leader in many aspects of the utility industry. Along with aggressive conservation efforts, for the past 10 years, 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.

Total DSM Investments
- $2,996,712 invested in FY 2011-2012.
- Over $37 million invested since January 2000.

Total Demand and Energy Savings – FY 2011-2012
- Incremental demand reductions of 1909 KW.
- Incremental coincident peak demand reductions of 1518 KW.
- Incremental net energy savings of 13,518 MWH.
- Incremental energy savings as a percent of GWP annual load of reached 1.23%.
- Estimated cumulative demand reductions since January 2000 of over 39,900 KW.
- Estimated cumulative energy savings since January 2000 of over 123,000 MWH.

Summary of Active DSM Programs – FY 2011-2012
- Low-Income Customer DSM Programs
  - Cool Care provides long-term electric bill discounts for low-income customers encouraging the replacement and recycling of old, energy inefficient refrigerators. Program replaced and recycled 5,745 refrigerators with new ENERGY STAR models since July 2003.
  - Smart Home Peak Hogs is our CMUA award winning program that reduces peak demand while providing bill relief for primarily low-income customers by encouraging the replacement of energy inefficient HVAC units in apartments. Since July 2003, this program has replaced 2,685 tons of energy inefficient Peak Hogs in Glendale apartments.
- General Residential DSM Programs
  - Smart Home Refrigerator Recycling targets secondary refrigerators for early retirement by offering free CFLs and a onetime discount off the electric bill. The retired refrigerators are recycled in an environmentally sensitive manner. Since 2006, 296 refrigerators have been recycled and 1,776 energy efficient light bulbs were distributed.

- Smart Home Energy and Water Saving Surveys reduces customer energy consumption through comprehensive in-home energy and water saving surveys, education, and direct measures installations. Installed energy saving measures include compact fluorescent lights, hot water heater wraps, and blower door tests. Since July 2001, this program has provided over 17,780 in home audits and energy education sessions, installed over 63,241 CFLs, 5,106 water heater blankets, and conducted 4,490 blower door tests.
- Smart Home Energy and Water Savings Rebates provides rebates to promote the early retirement of eligible energy and water saving appliances and devices. Over 39,863 rebates have been processed since July 2001.
- Smart Home AC Tune-Ups and Duct Sealing Services, provided by Proctor Engineering, helps residential customers save energy by ensuring that their air conditioning and duct systems are functioning at their optimal level. Over 10,368 tons of HVAC have been tuned since February 2000.
- 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 installation of energy saving devices including compact florescent light bulbs. Over 15,503 students have participated in this program since July 2001.
- 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. This program has planted over 2,950 trees since July 2004.
- GWP has partnered with OPOWER to provide Home Energy Reports to residential customers. The Home Energy Reporting system is a proprietary technology platform that integrates usage data with an array of third-party housing, GIS, and demographic data to derive personalized insights about customers and their energy use. 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. 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 deployment of Smart Meters throughout Glendale's service territory, customers with the new Smart Meters will be mailed an OPOWER home energy report that includes their Smart Grid data and access to the website where they can review their energy usage. OPOWER Home Energy Reports have reduced system wide demand by 3.3% and with the expansion of the program reducing an additional 1.7%.

- Small Business DSM Programs
  - Small Business Peak Hogs is modeled after the GWP's CMUA award winning residential program. It reduces peak demand and customer energy consumption, and provides bill relief for small business customers by providing incentives for small businesses and small business landlords to replace old, inefficient HVAC units. Since July 2006, this program has replaced 2,273 tons of energy inefficient Peak Hogs in Glendale small businesses.
  - Smart Business Energy Saving Upgrades is our 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. This program has conducted 4,530 energy audits and retrofits since July 2001.

- Smart Business AC Tune-Ups and Duct Sealing Services, 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. Over 7,207 tons of HVAC have been tuned since February 2000.
- Vending Miser is our CMUA award winning program installs "EnergyMiser®" intelligent energy controllers that use passive infrared sensors to power-down refrigerated vending machines, glass door coolers or snack machines when the area around the machine is not occupied. If there is no foot traffic in front of the machine for 15 minutes the machine is shut down. If someone walks by the machine, the sensor will sense the movement and send power back to the machine, keeping the product cold while significantly reducing energy use and costs. As a result, the technology produces an average energy savings of 46 percent. This program has installed 749 vending miser units since July 2009.

- Large Business DSM Programs
  - Business Energy Solutions (BES) provides incentives to complete pre-approved energy audits and retrofit projects. Incentives are limited to the lesser of 25% 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. Audit incentives are limited to $0.065 per square foot. This program has supported 263 retrofit projects since January 1999.
- City Building/School Retrofits
  - Working with Glendale Public Works Department, Glendale Unified School District, Private Schools, and GWP, this program implements energy and water savings retrofits in government and school buildings. Since 1999, this program has invested $9.9 million in energy efficiency programs, including replacement of all city traffic signals with LED lighting, lighting retrofits for city and school buildings, and major HVAC retrofits in city and school facilities.

Load Management Programs for FY 2011-2012

GWP entered into an agreement with SCPPA and Ice Energy to develop the specific designs for the SCPPA utilities, and other agreements for the purchase, installation, and maintenance of Smart Grid-enabled Ice Energy thermal storage systems. Ice Energy provides a unique, small scale, packaged Thermal Energy Storage product called an Ice Bear. The Ice Bear reduces peak electrical demand by utilizing electric energy to produce ice at night during off-peak hours and then use the ice for cooling during the day. The City has previously installed two Ice Bear units and has found them to work satisfactorily. Since the implementation of the program in 2010, 166 Ice Bear units have been installed at local small and medium sized businesses in Glendale as well as on city facilities.

GWP implemented two demand response pilot programs through SCPPA and North American Power Partners (NAPP) to test the effectiveness of demand response in emergency and other situations as part of GWP's U.S. Department of Energy (DOE) supported Smart Grid initiative. The two NAPP demand response programs offered were: The first program is a price responsive customer directed program that is a non-firm resource and economic-based demand response program that pays participating customers a market-based rate for demand response. The second program is a reserves program where reserves are available "on call" firm demand response resource program with relatively short customer notices and relatively short curtailment durations. These resources are firm, fully dispatchable resources that are controlled by the utility or the customer but are typically automated.

Evaluation, Measurement, and Verification

In 2010, Lincus completed GWP's EM&V plan and received GWP's approval to proceed with the detailed study of GWP's selected energy efficiency programs. This independent evaluation entails randomly selecting a sample size of applications within those programs that meet 90%+/- 10% confidence level, verifying the installation of particular units, and measuring/monitoring those units to verify the demand and energy savings calculated by Glendale Water & Power. Measuring/monitoring the units can vary between an hour and a week depending on the measure. Lincus has completed the EM&V study report. The initial draft study report was sent to GWP on January 2011 and was finalized in September 2011. The report is composed of both process and impact evaluations of selected GWP energy efficiency programs including verification of installations, numbers of sizes of installations, review of selected energy savings calculations.

The existing EM&V Plan evaluating GWP's selected energy efficiency programs based on the kWh savings. This Plan describes the programs, not only in what they do, but how much energy and demand is saved, and costs expanded during the 2008/2009 fiscal year. The purpose of this 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. In addition to meeting regulatory compliance requirements, EM&V studies are essential for a number of other reasons, namely: 1) to measure the effectiveness of existing programs and 2) to educate the program implementer on ways to improve existing and future programs.

Glendale – Summary of Energy Efficiency Programs, FY2012

Glendale		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	384	77	77	31,987	383,846	229	$13,628	$1,229	$14,857
HVAC	Res Cooling	956	193	219	169,361	3,923,761	2,534	$199,773	$20,688	$220,460
Appliances	Res Dishwashers	237	23	23	6,636	72,996	43	$16,550	$220	$16,770
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	9,744	484	66	398,551	1,992,753	1,130	$83,666	$5,066	$88,733
Pool Pump	Res Pool Pump	25	2	2	8,025	80,250	48	$3,562	$275	$3,837
Refrigeration	Res Refrigeration	1,353	62	62	539,550	8,543,167	4,822	$334,273	$24,954	$359,227
HVAC	Res Shell	702	205	205	110,842	1,627,586	969	$81,649	$5,159	$86,808
Water Heating	Res Water Heating	384	4	4	16,927	253,901	151	$5,491	$813	$6,304
Comprehensive	Res Comprehensive	5,005	108	108	8,877,383	43,181,479	23,709	$1,133,806	$114,625	$1,248,431
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	55	362	362	1,569,143	22,836,502	13,678	$258,221	$80,010	$338,231
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	411	365	365	1,747,793	19,175,615	11,404	$540,065	$64,033	$604,098
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	18			20,854	83,416	46	$3,392	$208	$3,600
HVAC	Non-Res Shell	107	25	25	21,555	215,552	128	$4,672	$685	$5,357
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		19,381	1,909	1,518	13,518,607	102,370,822	58,891	$2,678,747	$317,965	$2,996,712
T&D	T&D									
Total		19,381	1,909	1,518	13,518,607	102,370,822	58,891	$2,678,747	$317,965	$2,996,712

EE Program Portfolio TRC Test	**1.90**

GRIDLEY MUNICIPAL UTILITY

Gridley Overview

The City of Gridley's electric utility was established in 1910. Currently, the electric utility serves 2,789 customers (82.6% Residential; 17.0% Commercial; 0.4% Industrial). The City of Gridley experienced a growth rate of 7% during FY2012. Annual energy use for GMU between July 1, 2011 and June 30, 2012 was 33.2 megawatt hours.

Gridley Energy Efficiency Programs Highlights

Gridley Municipal Utilities (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 Energy Efficiency Programs:

- Energy Efficiency Hotline: A toll free line is available for GMU customers to answer questions and provide information on energy efficiency related matters.
- Energy Audits: On-site energy audits by GMU energy specialists 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 and/or additional visits to answer questions.
- Appliance Rebates: GMU provides rebates for the purchase of several ENERGY STAR® qualified appliances.
- Residential Cooling Rebates: GMU 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. GMU also offers a rebate for regular maintenance of cooling equipment (tune-ups every 3 years).
- Residential Lighting Rebates: GMU offers rebates to homeowners who install Energy Star qualified compact florescent lamps (CFLs) and/or LED holiday lights.
- Residential Electric Water Heaters: GMU offers customers a rebate toward the installation of a new, energy efficiency electric water heater.
- Weatherization Incentives: GMU provides financial incentives for homeowners who invest in weatherization measures, including insulation, window treatments/replacement and air/duct sealing and radiant barriers.

Commercial and Industrial Energy Efficiency Programs:

- Energy Audits and Rebates: On-site energy audits by GMU energy specialists are available to commercial customers. Energy efficiency measures are recommended based on each audit and follow up visits support implementation of recommended measures. Energy efficiency rebates are available for upgrades identified during these audits.
- Direct Install: Energy efficient compact fluorescent lamps (CFLs) are installed in residential homes at no cost to the customer.

- Commercial Lighting: A commercial lighting retrofit program is offered to businesses in the city's electric service territory. There is a prevalence of T-12 lighting throughout the city and most high bay lighting uses high intensity discharge fixtures instead of more efficient florescent fixtures. GMU provides technical assistance and financial incentives for the installation of energy efficient lighting upgrades.
- Custom Energy Efficiency Projects: GMU offers financial incentives to commercial customers based on site-specific consumption. Incentives are tailored to the individual customer needs based on the audit and the potential energy savings associated with the custom project.

Performance Results for FY2012

The City of Gridley's AB 2021 Energy Reduction Target for FY2012 was 75,000 kWh. In FY2012, the city exceeded their target by 317%, with a total net energy reduction of 312,477 kWh.

The City of Gridley's AB 2021 Demand Reduction Target for FY2012 was 22 kW. In FY2012, the city surpassed their target, with a total demand reduction of 183 kW.

The commercial sector delivered 65% of savings in FY2012; the commercial lighting retrofit program served 11 businesses, yielding a net savings of 135,934 kWh (representing the greatest impact on savings) and a custom project at Biggs-Gridley Memorial Hospital yielded a net savings of 66,309 kWh. The Direct Install program delivered 34% of savings in FY2012, yielding a net savings of 106,706 from the installation of energy efficient CFLs in 374 residential homes.

The City of Gridley's FY2012 EE Program Portfolio had a Total Resource Cost (TRC) of 1.72.
In comparison to FY2011, the city reported 75,015 kWh more at a cost of $1,389 less. A major factor in these results was implementation of the Direct Install program; at a cost of $0.29/kWh this program was the most cost-effective in the city's FY2012 portfolio.

The City of Gridley spent 117% of funding collected under the Public Benefit Fund requirement in FY2012; 66% was spent on Energy Efficiency, 6% on Low-Income, and 28% on Renewables.

FY2013 Forecast

The City of Gridley is forecasting that it will meet the AB 2021 targets by continuing to offer the current suite of energy efficiency rebates and by identifying opportunities for special program offers, with the commercial sector contributing the vast majority of the energy savings.

The city's energy efficiency rebates were revised for FY2011-FY2013 based on the Measure Quantification Report issued by KEMA in December 2009. The FY2011-FY2013 energy efficiency program reflects a comprehensive suite of measures that are cost-effective based on the rebate level offered and the quantified savings in the KEMA report. The city's forecast indicates that the FY2013 target of 75,000 kWh can be met with a funding level of $73,372 for rebates and administration. The city anticipates the FY2013 funding level of $155,000 will support a 50% increase in residential rebate activity, 61% increase in Direct Install activity, 24% increase in custom commercial activity (Biggs-Gridley Memorial Hospital) and 75% decrease in commercial lighting activity; this forecast yields 293,523 kWh and a TRC of 0.96.

Evaluation, Measurement and Verification

In 2011, GMU decided to forego an EM&V report and instead in order to perform a more comprehensive evaluation effort in the next year that will include work done between July 1, 2009 and June 30, 2012. That report will be completed and posted on the NCPA website sometime after June of 2012.

Gridley – Summary of Energy Efficiency Program, FY2012

Gridley		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	1	1	1	400	4,804	3	$75	$2,604	$2,679
HVAC	Res Cooling									
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	1	134	134	106,706	533,529	285	$31,009	$1,225	$32,234
Pool Pump	Res Pool Pump	2			822	8,220	5	$250	$4,357	$4,607
Refrigeration	Res Refrigeration	4			545	7,625	4	$300	$3,783	$4,083
HVAC	Res Shell	3	1	1	543	10,852	7	$886	$4,859	$5,745
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	4			1,219	3,658	2		$6	$6
Process	Non-Res Cooking									
HVAC	Non-Res Cooling									
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	1	47	47	135,934	1,495,271	829	$29,021	$22,427	$51,448
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	1			66,309	663,088	369	$40,418	$9,639	$50,057
Other	Other									
SubTotal		17	183	183	312,477	2,727,047	1,502	$101,959	$48,900	$150,860
T&D	T&D									
Total		17	183	183	312,477	2,727,047	1,502	$101,959	$48,900	$150,860
EE Program Portfolio TRC Test		**1.72**								

CITY OF HEALDSBURG

Healdsburg Overview

The City of Healdsburg's Electric Department provides electric service to a population of just over 11,200 through roughly 5,700 individual electric services. These electric services are predominantly residential (4,600 meters) with the remaining portion ranging from small commercial through moderately sized industrial facilities. While the city does continue to experience small increases in commercial development, the forecasted growth rate for electric consumption continues to center around 1 percent per year. The 2012 fiscal year energy use totaled 78,360 megawatt-hours. The City's historical peak coincidental demand was 21.1 megawatts in July 2006. In 2011, the City's power content is as follows: Geothermal 41 percent, small hydro 1 percent, large hydro 27.6 percent, and undefined market purchase totaling 31 percent.

Healdsburg Energy Efficiency Program Overview

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

Residential Programs

- Energy Efficiency Hotline: The city's electrical customers can call a local number to answer questions and provide information on energy efficiency related matters.
- Energy Audits: On-site energy audits by energy specialists 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 compact fluorescent lamps (CFLs) and LED holiday 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.

Commercial and Industrial 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.
- 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.

Performance Results for FY2012

For FY2011-FY2013, Healdsburg's City Council adopted ambitious energy efficiency goals that were more than double the EE goals of the previous reporting period. Reductions in residential energy efficiency participation and a reduction in commercial participation has resulted in program results below the FY2012 AB2021 goal.

The City of Healdsburg's energy savings target for FY2012 was 420,000 kWh. In FY2012, the city fell short of their annual target, but did accomplish a total energy reduction of 198,232 kWh.

The City of Healdsburg's AB2021 Demand Reduction Target for FY2012 was 118 kW. FY2012 end with the city under the annual target, netting a demand reduction of 75 kW.

The largest contributor to savings in FY2012 was the commercial lighting retrofit program, which yielded 171,320 net annual kWh and 55 net kW.

In FY2012, the Public Benefit Fund provided $303,489 dollars in support of low-income discounts, solar incentives, and energy efficiency rebates. Of this amount $151,201 provided rebates for energy efficiency projects, $41,107 was allocated for low-income discounts, and over $70,000 was paid out for solar incentives. The program's efforts in FY2012 resulted in a total resource cost (TRC) of 1.19, administrative costs represented roughly 13% of the total budget.

Program Forecast

The City of Healdsburg is forecasting to meet their AB2021 targets by continuing to offer a comprehensive suite of energy efficiency rebates and other program offers to their customers, with commercial lighting, a residential lower-income lighting program, and commercial custom projects for the city contributing the vast majority of the energy savings.

The city's energy efficiency rebates were revised for FY2011-FY2013 based on the Measure Quantification Report issued by KEMA in December 2009. The energy efficiency program will continue to offer a comprehensive suite of cost effective measures with proven and quantifiable savings. The city forecasts a need of $170,000 to support efficiency rebates and administration costs. Future program activity is forecasted to be level with historical participation, resulting in annual energy savings targeted at roughly 150,000kWh. Offering of direct install programs may result in increased annual savings depending on the type and depth of the programs.

LED Streetlight Retrofit

In the fall of 2009, the City of Healdsburg joined in a coordinated proposal that included Biggs, Gridley, Healdsburg and Ukiah to install LED street lighting as a demonstration project to test their efficacy and energy savings. The proposal was coordinated by the Northern California Power Agency (NCPA) and submitted as an Energy Efficiency Conservation Block Grant to the California Energy Commission (CEC) under the federal stimulus - ARRA program. The proposal received CEC approval in the fall of 2010.

On November 30, 2011, Healdsburg finished installing all the LED streetlights related to the ARRA grant. There were 101 LED streetlights installed (71 – 4bar @ 103watts ea. and 30 – 5bar @127wattsea. Each light replaced a 250watt HPS (actual draw for each existing HPS light fixture is roughly 293 watts). This results in an annual energy savings of roughly 78,764 kilowatt hours.

Healdsburg – Summary of Energy Efficiency Programs, FY2012

Healdsburg		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	10	10	10	3,768	45,216	25	$750	$3,513	$4,263
HVAC	Res Cooling	21	2	2	492	8,421	5	$1,560	$3,136	$4,696
Appliances	Res Dishwashers	9	2	2	512	5,629	3	$540	$438	$978
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	512	13	1	8,715	43,628	23	$1,008	$3,119	$4,127
Pool Pump	Res Pool Pump	7			1,550	15,504	8	$875	$1,110	$1,985
Refrigeration	Res Refrigeration	36	1	1	3,267	45,738	25	$2,700	$3,267	$5,967
HVAC	Res Shell	17	3	3	2,735	47,141	29	$67	$6,579	$6,646
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling									
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	17	55	55	171,320	2,531,853	1,363	$49,069	$19,695	$68,765
Process	Non-Res Motors	1	1	1	5,874	23,494	12	$2,971	$165	$3,136
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		630	86	75	198,232	2,766,624	1,494	$59,540	$41,022	$100,562
T&D	T&D									
Total		630	86	75	198,232	2,766,624	1,494	$59,540	$41,022	$100,562

EE Program Portfolio	TRC Test	**1.19**
	PAC Test	**2.51**

CITY OF HERCULES MUNICIPAL UTILITY

Hercules Overview
The Hercules Municipal Utility ("HMU") was created in 2001, with initial operations beginning in 2003, providing safe, reliable and cost-effective electric service to retail consumers in certain parts of the City of Hercules, including virtually all the redevelopment areas, and the Water Pollution Control Plant that is jointly owned by the Cities of Hercules and Pinole. Hercules Municipal Utility serves over 800 residential and commercial customers in a territory where most buildings are less than 10 years old. The utility has added more rebates in response to customer inquiries. Most customers inquire and request appliance rebates, lighting rebates and solar rebates. There has been no demand for other programs to date.

Although not energy efficiency program specific, there has been recent interest with regard to time-of-use rates and in addition, charging rates for battery electric vehicle (BEV) and plug-in hybrid electric vehicle (PHEV) recharged via a recharging outlet at the customer's premise.

Current Residential Programs
HMU offers incentives for the following energy efficiency measures:

- High Performance Windows
- Increased Insulation
- Sunscreens
- EnergyStar® Refrigerators, Clothes Washers and Dishwashers

Hercules also offers residential customers free compact fluorescent lights.

Commercial Programs
For business customers HMU offers rebates for:

- *Interior Fixture Replacements*:
  - Linear to T8 or T5 or High Output (HO) T5 fixtures
  - T8 or T5 To electronic ballast
  - Compact fluorescent fixtures
  - Interior pulse start metal halide fixtures
  - Occupancy sensors
  - De-lamping

- *Exterior Fixture Replacements*
  - Pulse-start metal halide fixtures

Other Conservation Programs
In order to further energy conservation, the HMU will provide a rebate of 12 cents per kWh for energy savings in the first year up to a maximum of 30 percent of installed cost for retrofits of existing facilities with energy saving devices not covered under specific programs. HMU also provides solar rebates to both residential and business customers

Hercules – Summary of Energy Efficiency Programs, FY2012

Hercules		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	2			105	1,265	1	$150		$150
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			91	1,271	1	$100		$100
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		3			196	2,535	1	$250		$250
T&D	T&D									
Total		3			196	2,535	1	$250		$250

EE Program Portfolio TRC Test	**0.24**

IMPERIAL IRRIGATION DISTRICT

Imperial Overview

- Established in 1936
- Imperial Irrigation District (IID) serves 148,562 customers
- Peak demand: 995 MW, on August 13, 2012
- Annual energy sales are 3,386 GWh in 2012

IID's Energy Efficiency Program Highlights

Total program expenditures of $11,281,278 in calendar year 2012 resulted in gross estimated savings of 28,225,911 kilowatt-hours and net estimated savings of 25,304,576 kilowatt-hours annually. This investment in efficiency is estimated to reduce peak purchases by approximately 7,450 kilowatts. The IID service area, which consists of Imperial Valley in Imperial County and the Coachella Valley in Riverside County, continues to be impacted by the current economic recession. The area has a historically high unemployment rate and some cities within the service territory continue to top the nation's list.

IID's Energy Efficiency Program Objectives:

- Provide a positive impact on utility cost by stabilizing energy consumption and reducing purchases of expensive peak power;
- Insure the program portfolio is cost effective thereby relieving upward pressure on rates;
- Assist customers by providing an opportunity to take charge of their energy utilization and by doing so, reduce their electricity cost;
- Provide customers the opportunity to improve the environment by conserving energy and/or acquiring renewable energy;
- Provide income qualified residential customers with rate assistance and positively impact their families by providing energy efficiency measures that reduce their dependency on subsidies;
- Increase the awareness of energy efficiency and utilization through effective promotion of programs and energy issues, and provide a forum for customer adoption of energy effective habits through energy education and;
- Assist schools in improving the energy efficiency of their facilities despite ever-diminishing budgets, thereby lowering energy consumption through energy efficient upgrades.

The Imperial Irrigation District offers a variety of non-residential and residential programs that align with these objectives. The following is a brief summary of each program within IID's 2012 energy efficiency portfolio.

2012 Commercial Customer Programs:

- **Custom Energy Solutions Program (CESP)** – offers financial incentives for annual energy savings to commercial customers. The financial incentives are intended for the customer's use in the purchase and installation of qualifying lighting, refrigeration, air conditioning, food service, and/or controls equipment. Qualifying EEMs must retrofit, replace, or upgrade old equipment with new, energy efficient technologies that exceed the applicable Title 24 energy efficiency requirements established by the California Energy Commission or current industry standards using

IID-approved project baselines, if Title 24 standards are not applicable. In July 2012, the lighting load incentive increased from $0.07 to $0.11, to encourage customers to move forward with pending projects. The CESP lighting incentive structure for the 2013 program year is being restructured to target retrofits that impact on-peak energy use. The incentive for on-peak will remain at $0.11/kWh saved and off-peak lighting that is retrofitted will receive $0.03/kWh saved.

- **New Construction Energy Efficiency Program (NCEEP)** – is a non-residential 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 the building envelope; or as a Systems Approach method for individual measures. The NCEEP assists customers in moving beyond initial cost considerations and towards the realization of long-term energy cost savings and avoidance of lost opportunities as new non-residential buildings are designed and constructed. The NCEEP is designed for commercial, agricultural and industrial new construction and renovation/remodel projects. Due to current economic conditions, there continues to be limited participation in this program as minimal new construction is taking place within IID's service territory.
- **Learning Energy Awareness Program (LEAP)** – Through LEAP, IID has issued a Call for Projects. The Call for Projects is open to all public schools (K-12) within IID's service territory. Qualifying energy efficient upgrades include lighting and HVAC measures. The objective of the program is to improve the energy efficiency of participating school's facilities, by lowering their energy consumption through energy efficient upgrades. Qualifying measures must retrofit, replace or upgrade old equipment with new, energy efficient technologies that exceed the applicable Title 24 energy efficiency requirements established by the California Energy Commission or current industry standards using IID-approved project baselines, if Title24 standards are not applicable. Each school is eligible to receive up to $35,000 to fund their project. Eligible costs include material, tax and freight cost plus installation labor. This program was well received by the school districts as budgets have been significantly impacted by state budget cuts. Most school districts within IID's service territories are designated as disadvantaged communities. As such, IID has expanded its qualifying customer list to include private and charter educational institutions. Participating schools must be registered with the California Charter Schools Association or the California Department of Education.
- **Keep Your Cool (Pilot Program) –** provided qualifying small commercial customers, such as school districts and small grocers with a budget between $2,500 - $5,000 per site to implement energy efficiency refrigeration measures that helps small businesses decrease their operating costs. Keep Your Cool is a direct install program, where a certified contractor will work with eligible small businesses to evaluate their energy use, identify energy-saving opportunities and install energy-efficient retrofit replacement equipment at no cost to the customer. Due to the success of the pilot, a full scale direct install program offering these energy efficient refrigeration measures will be implemented in 2013.
- **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 show problems that may, when corrected, save the customer significant amount of money over time. IID offers energy audits and customized reports to customers.
- **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 show problems that may, when corrected, save the customer a significant amount of money over time. IID offers energy audits and customized reports to customers.

- **Open for Business (Small Business Direct Install Program)** – provides qualifying small commercial customers with up to $2,500 worth of energy efficiency measures that helps small businesses decrease their operating costs. Open for Business is a direct install program, where a certified contractor works with eligible small businesses to evaluate their energy use, identify energy-saving opportunities and install energy-efficient retrofit replacement equipment at no cost to the customer. This is the second continuous year that the IID has offered the Open for Business program. Due to popularity and consistent energy savings generated by the program, the program will again be offered in 2013.
- **Rates** - IID offers interruptible and high voltage rates for its large commercial and industrial customers.

2012 Residential Customer Programs:

- **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.
  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. Although individual measure energy savings vary, overall this program consistently results in residential load reduction but more importantly, garners customer satisfaction. In response to customer feedback, IID routinely reassesses the list of energy efficiency measures, adding new qualifying equipment and removing those with lower activity. The 2012 qualifying product categories for residential customers include:
  - ENERGY STAR qualified programmable thermostats
  - Energy efficient central air conditioners/heat pumps
  - Packaged terminal air conditioners and heat pumps
  - Commercial and industrial HVAC equipment
  - Lighting
  - Energy efficiency motors
  - Vending misers
  - Dual pane windows
  - Attic insulation
  - Attic fan
  - Variable speed pool pump
- **Refrigerator Recycling** – IID offers free refrigerator pick up and proper recycling services to our customers. In addition, they also receive a $50 incentive for each qualified refrigerator or freezer, up to two per household. This program targets older model refrigerators and freezers as well as second units kept in basements or garages. The utility benefits by removing the excess refrigeration load while the customers will see immediate savings by replacing their older models with more efficient versions and eliminating excess units.
- **Weatherization** - this program offers comprehensive low cost energy education and

weatherization services for residential customers in IID territory. For a low initial investment of $100, participating customers will receive up to $1,000 in energy saving services and equipment as determined through an energy assessment of the customer's home. Customers currently enrolled in IID's income qualified Residential Energy Assistance Program (REAP) may participate in the program at no-cost. Measures can include: CFLs, weather-stripping, hot water heater tank wraps, refrigerators, shade screen, window film, window replacement, ceiling insulation, duct sealing, refrigerant charge and attic fan.

- **Payment Assistance -** IID offers several income-qualified assistance programs designed to help our customers meet their energy needs.
  - Residential Energy Assistance Program (REAP) offers income-qualified customers a discount of up to 30 percent discount on their electric billing rate.
  - Emergency Energy Assistance Program (EEAP) provides financial assistance to customers facing a financial crisis and disconnection for nonpayment.
  - Medical Equipment Energy Assistance Program (MEEAP) is an assistance program that reduces the 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.
  - As a large number of IID's residential customers qualify for assistance, a significant portion of revenue generated through the public benefits charge are allocated toward these programs. Program expenditures for the 2012 year totaled over $4.5 million, with enrollment of 12,455 customers.

2012 Other Programs

- **CFL Recycling Events** – throughout the year, IID hosted various events where customers were allowed to recycle up to five incandescent light bulbs in exchange for CFLs. Approximately 3,329 CFLs were exchanged in 2012. These events are an effective method to bring in customers to share information on our other programs. Program representatives are available on site to register customers in the various programs offered by IID.
- **Proposed IID Energy Efficiency Programs and Services**: **(2013)** the 2013 program portfolio will allow IID to meet their annual target of 18,381 mega-watt hours. There are several programs from 2012 that will continue into 2013, some with revised guidelines. Continuing programs consist of:
  - Custom Energy Solutions Program
  - New Construction Energy Efficiency Program
  - Residential and Commercial Energy Audits
  - Energy Rewards
  - Weatherization
  - Open for Business (Small Business Direct Install Program)
  - Refrigerator Recycling Program
  - Payment Assistance

New Program for 2013

- **Quality AC Maintenance** – will aggressively target the "maintenance," i.e. improve the efficiency of operation of existing central air conditioners or heat pumps throughout the Imperial Irrigation District (IID) service territory at the residential and small commercial sectors (demand less than

100 kilowatts). The maintenance services to be provided are: duct testing and sealing (DTS) and refrigerant charge adjustment (RCA) at no cost to the participating customer.

Evaluation, Measurement & Verification:
IID will conduct an evaluation of their programs on a bi-annual basis, covering programs for the two-year cycle. Not all programs will be evaluated in each evaluation cycle. Programs that generate the most energy savings will be included in each evaluation and others will be included on an as needed basis. Full results and report will be submitted to SCPPA and incorporated in the SB1037 accordingly.

Changes in Programs that Affected Energy Savings or Funding Amounts:
Incentive levels were temporarily increased in the non-residential Custom Energy Solutions Program (CESP) and for the attic insulation rebate offered through IID's Energy Rewards prescriptive rebate program.

In July 2012, the lighting load incentive offered through CESP increased from $0.07 to $0.11 in an effort to encourage customers to move forward with a number of pending projects that seemed to have stalled in the process. As a result of the increased incentive and consistent marketing efforts, IID realized a significant increase in estimated energy savings generated from these projects.

During the 2012 program year, IID increased the incentive for attic insulation in an effort to target residential structures with little to no attic insulation. This measure proved to be extremely successful with both customers and local contractors. IID experienced heavy participation as a direct result of aggressive marketing efforts by contractors. Funding for this measure was increased through board direction.

Energy Efficiency Programs that Resulted in the Greatest Impact:
IID offered two direct install programs during the 2012 program year, the Open for Business small commercial program and a residential weatherization program. Both programs fully subscribed by the end of the year and allowed the utility to capture energy savings that would have been lost absent a direct install delivery method. These programs provided for the installation of various energy efficiency measures at low-cost and in some cases no-cost, to the customer which is critical in economically disadvantaged communities.

Imperial – Summary of Energy Efficiency Programs, FY2012

Imperial ID		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling	4,900	699	2,267	1,432,315	24,150,785	15,282	$714,640	$277,799	$992,439
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	19,620	934	128	767,712	3,838,561	2,177	$176,937	$120,150	$297,087
Pool Pump	Res Pool Pump	196	21	21	119,252	1,192,522	712	$41,600	$8,208	$49,808
Refrigeration	Res Refrigeration	793	25	25	242,041	1,985,052	1,120	$81,355	$11,804	$93,159
HVAC	Res Shell	5,450	900	936	1,903,194	28,776,958	17,922	$2,486,765	$263,273	$2,750,038
Water Heating	Res Water Heating	92	2	2	6,992	104,880	60	$3,168	$774	$3,941
Comprehensive	Res Comprehensive	2,146	167	167	775,487	2,326,462	1,320	$167,448	$54,148	$221,596
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	4,806	1,348	1,211	3,309,781	51,578,468	31,496	$1,643,192	$549,897	$2,193,090
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	88,833	3,072	1,537	14,541,715	179,478,497	101,471	$3,691,388	$553,643	$4,245,031
Process	Non-Res Motors									
Process	Non-Res Pumps	2	7		9,957	174,160	97	$1,120	$535	$1,655
Refrigeration	Non-Res Refrigeration	853	266	77	2,149,978	24,064,752	13,412	$195,648	$223,368	$419,016
HVAC	Non-Res Shell	2	9		18,211	454,343	276	$2,473	$8,222	$10,696
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other	76			27,941	111,766	62		$3,722	$3,722
SubTotal		127,768	7,450	6,369	25,304,576	318,237,206	185,407	$9,205,734	$2,075,544	$11,281,278
T&D	T&D									
Total		127,768	7,450	6,369	25,304,576	318,237,206	185,407	$9,205,734	$2,075,544	$11,281,278

EE Program Portfolio	TRC Test	**1.55**
	PAC Test	**2.98**

LASSEN MUNICIPAL UTILITY DISTRICT

Lassen Overview

Lassen Municipal Utility District (LMUD) was established in 1988. It serves 10,500 customers (12,500 meters). Fifty percent of energy sales are residential, with the remaining 50 percent primarily commercial with a few agricultural and industrial customers. The median residential income in Lassen is at or below the poverty level. There is little or no difference in load demands for LMUD between winter and summer. Its annual energy use is 131 gigawatt-hours. LMUD's annual power content is largely hydroelectric (depending on the time of year) due to the utility's power purchase contract with Western Area Power Administration and its base resource allocation from the Central Valley Project. The remaining power is mixed between various renewable and non-renewable power. LMUD's mission is to provide reliable, quality power to our community at the best possible price. LMUD works closely with all of the other local agencies to promote planned economic growth in our service area.

Lassen Energy Efficiency Programs Overview

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.

Current Programs/Services

- 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 CFL's 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. Finally, LMUD incentivizes homeowners to invest in home weatherization (insulation, window treatments/replacements and duct sealing) through the residential rebate program.
- Custom Energy Projects: LMUD offers customized rebate programs to larger customers who have special projects that do not fit into existing rebate categories.
- "Smart*Built*"/"SmartBuilt Retro": SmartBuilt targets new construction, as well as remodeled homes, to encourage homeowners and contractors to install energy saving measures such as low-e windows, upgraded insulation, energy efficient appliances and high HSPF/SEER heating and cooling units.
- Energy Audits: Commercial customers may request an onsite energy audit, provided free of charge by LMUD.
- "Smart*Light*": Smart*Light* was introduced in 2008 and is LMUD's commercial lighting retrofit program. The program offers commercial customers rebates for replacing inefficient lighting with new technology, such as removing existing T-12 fluorescent bulbs and replacing them with T-8s.
- "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 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.

Performance Results for FY2012

LMUD's energy reduction target for FY2012 was 375,000 kWh. They exceeded this annual goal with a total net energy reduction of 778,184 kWh.

LMUD's demand reduction target for FY2012 was 93.40 kW. They exceeded this annual goal with a total net demand reduction of 341 kW.

LMUD's EE program portfolio was delivered at a Total Resource Cost of 0.59 in FY2012.

FY2013 Forecast

LMUD's energy efficiency rebates were revised in FY2011 based on the Measure Quantification Report issued by KEMA in December 2009. The FY2012 energy efficiency program reflects a comprehensive suite of measures that are cost-effective based on the rebate level offered and the quantified savings in the KEMA report. For FY2013, LMUD will be discontinuing the "SmartBuilt"/"SmartBuilt Retro" and Residential Weatherization rebates. LMUD's forecast indicates that the FY2013 target of 375,000 kWh will be met with a funding level of $147,063 for rebates and administration.

Evaluation, Measurement and Verification

LMUD undertook its first EM&V report in 2009/2010. The report focused on the program that produced the largest amount of savings during the year, the Keep Your Cool program. Keep Your Cool provided LMUD customer's refrigeration door gaskets, strip curtains and door closers at no cost to the customers. The evaluation indicated that the program was well received overall and that most demand and consumption savings figures were reasonable and close. The one exception was glass reach-in freezer auto-closers which appeared to indicate a discrepancy between kW demand reduction, kWh savings and reasonable hours of operation. That issue is under consideration for the upcoming year.

Utilities have the option of performing EM&V annually, or once every three years. LMUD will most likely perform the next EM&V in 2012/2013.

Lassen – Summary of Energy Efficiency Programs

Lassen		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	23	23	23	9,208	110,497	61	$805	$8,905	$9,710
HVAC	Res Cooling	20	3	2	325	5,851	4	$1,334	$342	$1,676
Appliances	Res Dishwashers	12	2	2	634	6,970	4	$420	$562	$982
Consumer Electronics	Res Electronics									
HVAC	Res Heating	64	21	21	11,823	212,810	107	$22,246	$5,698	$27,944
Lighting	Res Lighting	97	22		5,344	26,889	14	$811	$3,912	$4,723
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	49	1	1	6,378	88,531	48	$2,450	$6,541	$8,991
HVAC	Res Shell	23	6	6	3,929	78,584	49	$6,813	$5,858	$12,671
Water Heating	Res Water Heating	21			4,331	56,307	30	$4,046	$4,111	$8,157
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	1			319	4,785	3	$650	$84	$734
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	2	102	102	202,459	2,154,369	1,193	$126,297	$28,914	$155,210
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	1	96	96	503,259	2,516,296	1,327	$39,666	$27,584	$67,250
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	99	65	65	30,175	90,526	50	$6,000	$1,131	$7,131
Other	Other									
SubTotal		412	341	319	778,184	5,352,414	2,890	$211,537	$93,642	$305,179
T&D	T&D									
Total		412	341	319	778,184	5,352,414	2,890	$211,537	$93,642	$305,179

EE Program Portfolio TRC Test	**0.59**

LODI ELECTRIC UTILITY

Lodi Overview

- Established in 1910
- 25,350 customers (22,244 residential; 3,106 commercial/industrial; FY 11-12)
- Peak demand: 116 megawatts; occurs in: July daytime (FY 11-12)
- Annual Energy Use: 435,655,731 kilowatt hours (FY 11-12)

LEU Energy Efficiency Program Highlights

Since 1998, LEU has spent more than $6.2 million on demand-side management rebates and programs designed to increase energy efficiency for the community, resulting in an 18 percent peak demand reduction and a 17 percent energy reduction.

Current (FY 12-13) Commercial/Industrial Customer Programs:

- *Lodi Commercial (G-1 & G-2) Rebate Program:* Provides rebates for small and medium-sized commercial customers who install designated energy efficiency measures, such as: attic insulation, window tinting/shade screens, programmable thermostats, ceiling fans, appliances, high efficiency lighting retrofits, and maintenance of refrigeration/HVAC equipment.
- *Lodi Commercial/Industrial (G-3 to I-1) Rebate Program:* Provides rebates of up to $22,000 to large 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 $50,000 are available for commercial and industrial customers who install designated and approved energy efficiency measures. The customer does qualify for the aforementioned energy efficiency rebates in conjunction with this financing program.

Current (FY 12-13) Residential Customer Programs:

- *Lodi Appliance Rebate Program:* Provides rebates to all customers who purchase an EnergyStar ® refrigerator 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, 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).

Current (FY 12-13) Commercial and Residential Programs:

- *Lodi Energy Audit Program:* LEU offers free on-line and on-site residential and small commercial customer energy audits.

Current (FY 12-13) School/In-Classroom Programs:

- *Lodi LivingWise Program:* Provides energy efficiency "kits" and manuals to 445 6th grade students in Lodi schools; the program is designed to teach the students the basics of energy and water conservation.
- *Lodi Solar Schoolhouse Program:* Provides teacher mini-grants and teacher training regarding solar/renewable energy resources; also via this program, we sponsor various solar fairs and events at individual school (students and teachers build solar-powered fountains, model race cars, houses, ovens, etc.).
- *Youth Energy Summit:* Provides scholarship opportunities for juniors and seniors in high school; the eligible students must participate in a two-day workshop (known as the Youth Energy Summit), then complete a community service learning project, based upon the information they garner from the Summit/training. After completing their "project," the student teams then present their findings and projects to a panel of judges, who in turn award the scholarship funds.

Current (FY 12-13) 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. In order to secure a grant payment, customers must consent to in an in-home energy audit.
- *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.

Measurement Methodology

Lodi utilizes KEMA Consulting 'Measure Quantification Methodology' report for various residential and small commercial rebate programs; for large commercial and industrial customer rebates/programs, the customer is required to provide to the utility an engineered energy analysis/audit detailing their projected savings.

In addition, LEU has implemented an Evaluation, Measurement & Verification (EM & V) Plan, and has completed five annual assessments of randomly selected programs and large rebates as part of the designed EM & V Plan. For the FY 11-12, projected energy savings were verified for five (5) large customer rebates, and were assessed in October of 2012. Note: LEU retained the services of Summit Blue/Navigant Consulting to assist in the creation of the aforementioned Lodi EM & V Plan, as well as the on-site, first, second and third year kWh savings verification processes. LEU has utilized ERS Consulting for similar kWh and kW verification savings in 2011 and 2012 (years four and five).

Proposed LEU Energy Efficiency Programs and Services: (for 2013-2014)

Maintain existing programs, while possibly expending additional Public Benefit Program funds on demand-side management rebates/incentives.

LEU Demand Reduction Programs

LEU does not currently have any demand reduction programs in place.

Lodi – Summary of the Energy Efficiency Programs in 2012

Lodi		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	142	20	20	7,737	92,840	51	$7,250	$443	$7,693
HVAC	Res Cooling	268	35	40	13,294	224,911	138	$29,822	$1,996	$31,818
Appliances	Res Dishwashers	130	11	11	3,192	35,116	19	$3,250	$168	$3,418
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	31	86	77	446,164	2,230,819	1,191	$16,734	$8,470	$25,204
Pool Pump	Res Pool Pump	5			1,107	11,075	6	$1,000	$49	$1,049
Refrigeration	Res Refrigeration	362	19	19	95,342	699,341	379	$76,593	$3,007	$79,600
HVAC	Res Shell	164	373	373	187,788	2,190,334	1,301	$40,181	$15,290	$55,471
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	14			1,973	29,588	17	$8,667	$187	$8,854
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	51	380	380	1,426,549	15,390,399	8,488	$228,256	$73,877	$302,133
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	3	18	18	149,546	1,645,006	867	$19,828	$6,876	$26,703
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		1,170	944	939	2,332,693	22,549,428	12,458	$431,580	$110,362	$541,942
T&D	T&D									
Total		1,170	944	939	2,332,693	22,549,428	12,458	$431,580	$110,362	$541,942

EE Program Portfolio TRC Test	**2.04**

CITY OF LOMPOC

Lompoc Overview

Lompoc initially implemented energy audit programs in 1981. In 1991, the programs were expanded to include energy efficiency education programs. In 2001, energy efficiency rebates and a low-income refrigerator subsidy program were added. Since then, additional programs have been added and existing programs modified to accommodate the community's needs.

Of the Public Benefit Fees collected in 2012, Lompoc has spent 24.7% or $117,657.39 on energy efficiency programs. Of that amount, 14% or $14,359.92 was expended for the Low Income Refrigerator Program. These amounts do not include administrative or other program fees.

Current Commercial Customer Programs:

- Commercial Lighting Rebate: Provides a rebate to commercial customers who retrofit T12 to T8 fluorescent lighting that, for most businesses, will realize a 2.5 year payback.
- Exit Sign Rebate: rebate of $15 to replace existing incandescent or fluorescent lit exit signs with LED lit signs, or $30 the replace same signs with electro-luminescence signs. This rebate was first offered in 2002.

Current Commercial and Residential Customer Programs:

- Refrigerator Rebate: A $144 rebate is paid to electric customers, or landlords who rent to City
- Customers, to replace working refrigerators or freezers with a new Energy Star model that results in a minimum energy savings of 316Kwh per year. The old appliance must be recycled at the City's landfill.
- Refrigerator BuyBack Program: $35 is paid to customers who recycle, at the City's landfill, any second working refrigerator or freezer. This program was first offered in May 2001.
- LED Holiday Lighting: A rebate of $4 for up to 75 light strand and $8 for larger strands is paid to utility customers who purchase LED holiday lighting. This program was first offered in October
- 2005.
- Renewable Resource Rebate: A rebate of $3.00 per watt is paid to electric customers who install a grid-tied photovoltaic system of 1Kw or larger in size. This program was first offered in February 2004.
- •Customized Rebate: a rebate of $.15 per watt saved is offered for any energy efficient improvement not offered by other rebate programs.
- Energy Audits: Lompoc offers on-site energy and water audits for all customers and/or mail-in audit for residential customers. Customers receive money saving advice, a conservation kit that includes a CFL, refrigerator thermometer, water saving aerators and showerheads, a positive shut-off nozzle for outside watering, and information about incentives designed to save water and electricity.
- Equipment Loan: The City has energy monitoring devices that can be borrowed to monitor energy usage of most appliances found in the average home.

Current Low Income Customer Programs:

- Rate and Energy Assistance Programs: Lompoc offers a rate discount for low-income customers and a special medical needs rate. Current subsidy is $8.00 per month not to exceed electric charges.
- Income Qualifying Refrigerator Purchase Program: For low-income customers, a payment of up to $635 is made toward the purchase of a new refrigerator. The old refrigerator must be in working order; must use at least 316Kwh per year more than the new refrigerator; and will be recycled at the City's landfill. The customer is required to repay the City $240 over an one-year.

Current Community Program

- Education Programs: Lompoc encourages energy conservation through school and community education programs and presentations.
- The City offers electric safety programs through classroom presentations and community functions.

Proposed City of Lompoc Energy Efficiency Programs and Services

- Evaluate existing programs to determine if incentives are attractive to customers and increase incentive levels if necessary to assure continued participation in all programs.
- Ensure that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency measures.
- Measure and evaluate the impact of energy efficiency programs.
- Lompoc is currently working with Santa Barbara County and cities in our area to develop and provide an AB811 financing program for residential and business owners .

Lompoc Demand Reduction Programs

Lompoc offers a Firm Curtailable Load Purchase Program, but no customer has utilized it since it was created. Customers who have an average peak-period demand of at least 500 KW during each of the last six summer months may apply for this program. The customer must sign a contract for electric service for a five-year period, and will be required to reduce demand when the City requests such curtailment. The customer receives a demand payment of $6.00 per kilowatt of curtailed demand per season and $0.10 per kilowatt-hour.

Economic Impact

It is still evident that the downturn in the economy is affecting customer willingness to spend money on more energy efficient appliances or other projects. Conversely, with income levels decreasing, the subsidized low income refrigerator program has seen an increase in participants this past year.

Lompoc – Summary of Energy Efficiency Programs, FY2012

Lompoc		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling									
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	286	32	1	9,912	50,731	27	$1,488	$270	$1,758
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	80	4	4	25,970	229,292	124	$16,368	$1,438	$17,806
HVAC	Res Shell									
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	87			1,810	5,429	3		$31	$31
Process	Non-Res Cooking									
HVAC	Non-Res Cooling									
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	1,468	17	16	65,230	883,109	489	$17,970	$7,466	$25,436
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	319	57	55	482,806	1,934,311	1,020	$915	$9,919	$10,834
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		2,240	110	76	585,728	3,102,871	1,664	$36,741	$19,124	$55,865
T&D	T&D									
Total		2,240	110	76	585,728	3,102,871	1,664	$36,741	$19,124	$55,865

EE Program Portfolio TRC Test	**0.95**

LOS ANGELES DEPARTMENT OF WATER & POWER

LADWP Overview

- Established in 1902 to deliver water to the City of Los Angeles. Electricity distribution began in 1916.
- Serves 3.9 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.
- A peak demand of 6142 MW was registered in the September 27, 2010.
- Annual energy use is 24.6 million megawatt-hours.
- 9,232 employees.
- The largest municipal utility in the nation.

LADWP Energy Efficiency Program Highlights

- LADWP Energy Efficiency Program expenditures during the period beginning FY 2000-2001 through FY 2011-2012 totaled $325.6 million.
- These programs achieved peak demand reduction of 316.1 MW and 1,211.0 GWh of energy savings during this period.
- The average life cycle cost of these savings was $0.024/kWh.
- The savings are based upon estimation methodologies approved for use by both Investor Owned Utilities (IOU) and Publicly Owned Utilities (POU) for energy efficiency program reporting purposes. Savings have been adjusted annually since FY 2003-04 based on measurement and verification performed by an independent third party.

LADWP Energy Efficiency Measurement & Verification (M&V) Activities

LADWP is currently in the process of renewing services of an independent third party to evaluate its energy efficiency programs. During 2011, the incumbent firm completed assessments of energy efficiency projects done in fiscal year 2009-2010 (July 1 – June 30). Projects reviewed represent a random sampling from the LADWP's energy efficiency program portfolio, with a focus on non-residential programs.

LADWP plans to continue evaluation, measurement and verification activities through 2015, with an emphasis on improving evaluation criteria, sampling methods, depth of program evaluation and transparency of annual EM&V reports to be completed over the 2011 through 2014 fiscal years. LADWP plans on following the POU EM&V Guidelines developed by the CEC and is working closely with the CEC to improve its EM&V program.

Overview of LADWP's FY 2011-2012 Energy Efficiency Programs

Commercial Customer Programs

Total Non-Residential Program expenditures: $25.85 million resulting in 20.2 MW of peak demand reduction and 106.2 GWh of annual energy savings. The rebates and rebate levels assist LADWP customers in lowering energy consumption and energy expenses while benefiting the environment. Program enhancements were made to encourage maximum achievable program participation.

- Commercial Lighting Efficiency Offer: Provides rebates for a wide variety of high efficiency lighting measures to retrofit existing buildings. Program is largely vendor-driven.
- Chiller Efficiency Program: Provides rebates to retrofit existing buildings with high-efficiency electric chillers. Rebates are available for all types of chillers (air-cooled and water-cooled). In addition, water-cooled centrifugal chillers now can be tested at either standard ARI or non-standard ARI conditions provided the cooling tower meets specified performance criteria. Higher rebate levels are based on the percentage that the chiller's Integrated Part-Load Value (IPLV) performance exceeds California's Current Title 24 requirements for chillers.
- Refrigeration Program: Provides incentives for a variety of energy efficient refrigeration measures. Rebate measures include ice machines, solid and glass refrigerator doors, door gaskets, night covers, strip curtains, vending machine controllers, etc. To be eligible for rebates, participating customers must reserve funds and receive approval to proceed prior to purchasing and installing the qualifying refrigeration equipment.
- Custom Performance Program: Provides incentives for cost-effective energy-saving opportunities not served by existing prescriptive offerings. Program includes equipment controls, CO sensors, high efficiency technologies, and other innovative strategies. LADWP engineers evaluate the energy-saving benefits (quantity, reliability, persistence) of each submitted measure and calculate savings-based financial incentives for participating customers. Energy saving measures, equipment or systems must exceed Title 24 or minimum industry standards.
- New Construction Incentive Program: Provides incentives and technical assistance for new construction and major remodel projects; uses prescriptive incentives for standard new construction, and more aggressive energy points-based incentives for projects receiving LEED certification.
- Financing Program: Provides low-interest loans for the installation of energy efficient equipment in existing buildings (including city facilities).
- Energy Use Assessments: On-site energy assessments for existing non-residential buildings, available free-of-charge.
- Technical Assistance: Provides technical assistance and design review for retrofit projects in existing building and new construction projects.

Residential Customer Programs

Total Residential Program expenditures: $11.42 million resulting in 3.4 MW of peak demand reduction and 19.7 GWh of annual energy savings.

- Consumer Rebate Program: Provides rebates for the purchase and installation of Energy Star rated appliances and other high-efficiency equipment, including refrigerators, air-conditioners, windows, pool pumps, etc.
- Refrigerator Recycling Program: LADWP provides free pick-up and recycling of old, inefficient refrigerators, along with free CFLs and a rebate of $50 for each recycled refrigerator.
- Low-Income Refrigerator Exchange Program: Provides new energy-efficient refrigerators to low-income customers in exchange for their existing inefficient older models.
- Home Energy Saver On-Line Audit: Web-based energy audit analyzes energy use and makes recommendations for efficiency opportunities.

Water Efficiency Programs
LADWP maintains a comprehensive suite of water efficiency programs to help our residential and non-residential water customers reduce their water usage through the adoption of various hardware measures. These actions to promote water use reduction have corresponding energy use reduction benefits, due to the amount of energy embedded in LADWP water throughout the cycle of treatment, distribution, and wastewater collection and treatment. All of this embedded energy is sourced from the LADWP grid (out-of-territory conveyance is omitted for now), so reductions in water usage due to these programs also save LADWP electricity. LADWP quantifies this energy embedded as part of our AB32 GHG emissions reporting; therefore the amount of LADWP electricity saved per unit of water use reduced is known. LADWP is pleased to report for 2011/12 1.2 GWh of annual energy savings due to our water efficiency hardware programs. In addition, LADWP is also revising our annual energy efficiency savings reports back to 2000-01 to include the embedded energy savings due to our water efficiency hardware program achievements in each of those years, as reflected in the chart below.

Fiscal Year	Original Reported Savings	Hardware Savings (AF)	Embedded Energy Savings due to Hardware Measures (GWh)	Revised Savings Reported Feb 12
00-01	65.0	3078	1.9	66.9
01-02	164.2	2452	1.5	165.7
02-03	52.3	2630	1.6	53.9
03-04	34.5	3257	2.0	36.5
04-05	37	3299	2.0	39.0
05-06	16.6	2404	1.5	18.1
06-07	67.9	2095	1.3	69.2
07-08	138.8	782	0.5	139.3
08-09	317.8	3127	1.9	319.7
09-10	183.6	4269	2.6	186.2
10-11	177.9	2495	1.5	179.4
11-12	125.9	1993	1.2	127.1
Totals:	**1,381.5**	**31,881.8**	**19.5**	**1,400.9**

Proposed FY 2012-2013 LADWP Energy Efficiency Programs and Services

Commercial Customer Programs
Total Non-Residential Program budget: $94.6 million resulting in a projected 30.1 MW of peak demand reduction and 238 GWH of annual energy savings.

- The Customer Lighting Efficiency Offering (CLEO) program offers incentives to help make a wide variety of high-performance lamps and lighting fixtures cost-effective, and targets any size business that still utilizes standard fixtures. CLEO is designed to be consistent with California's statewide lighting programs, leveraging established contractor networks to offer non-residential customers a full suite of lighting products and services to improve the energy efficiency in their businesses by upgrading/retrofitting core lighting systems.

- The Chiller Efficiency Program (CEP) offers incentives for all types of high efficiency chillers, from air-cooled to water-cooled chillers, with rebates up to $193 per ton and 100% of the incremental cost. CEP is designed to assist large offices, hotels, hospitals/medical facilities, institutional facilities, or any business with a chiller based air-conditioning system.
- 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.
- 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. Program offerings include incentives for equipment controls, CO monitoring systems, hotel guest room controls, variable speed drives, cutting edge high-efficiency lighting technologies, and other innovative strategies.
- The Energy Efficiency Technical Assistance (EETAP) Program is a Non-Resource program that goes a step beyond the assistance offered by standard programs to provide technical and economic modeling and analysis services to help customers fully develop and implement comprehensive projects. Program offerings include technical support for audits/assessments, technical analysis of various bundles of energy efficiency measures and options, economic analysis (ROI, etc.) and recommendations that ultimately lead the customer to participate in other LADWP Resource Programs.
- 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 to offer a uniform, multi-faceted program designed to consistently serve the needs of the commercial building community. Savings By Design 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.
- The Small Business Direct Install (SBDI) Program is a free direct-install program that targets small businesses customers under 30 KW in the LADWP service territory. LADWP is partnering with Southern California Gas Company on this Program to offer tri-resource efficiency program aiming to reduce the use of electricity, water and natural gas.
- The Retrocommissioning (RCx) 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.
- The Los Angeles Unified School District Direct Install (LAUSD DI) Program is designed to improve energy and water efficiency throughout LAUSD's facilities through upgrades in to electricity, water and gas consuming systems, in partnership with Southern California Gas Company. 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.

- The LADWP Facilities Program strives to improve energy efficiency throughout LADWP's facilities with energy efficiency upgrades in HVAC and lighting. It identifies and assists those LADWP facilities to reduce energy usage, which will result in a reduction in energy consumption and procurement expense for LADWP that would otherwise be borne by LADWP customers.
- Financing Program offers low-interest loans for the installation of energy efficient equipment in City facilities.

Residential Customer Programs

Total Residential Program budget: $26.4 million resulting in a projected 3.9 MW of peak demand reduction and 28.3 GWH of annual energy savings.

- The Consumer Rebate Program (CRP) 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.
- The Refrigerator Turn-in and Recycling Program (RETIRE) Program offers a $50 rebate, along with free pick-up, to residential customers to turn-in old refrigerators and freezers for eligible units for recycling, which 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.
- The Low-Income Refrigerator Replacement Program (LIREP) 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.
- The Home Energy Improvement Program (HEIP) 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 aims to serve disadvantaged communities and residential customers.
- The California Advanced Home Program (CAHP) is an incentive program that utilizes the statewide CAHP Program through its partner utility, Southern California Gas Company, to incent cost effective energy efficiency upgrades in residential new construction. CAHP intends to target 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.
- The Energy Upgrade California™ (EUCA) is a collaborative effort among California counties, cities, nonprofit 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. Energy Upgrade™ California to offer incentives to homeowners who complete select energy-saving home improvements on single-family residences or 2-4 unit buildings, such as a townhouses, condominiums, etc.
- The Home Energy Saver Online Audit analyzes energy use and makes recommendations for efficiency opportunities.

Note: FY11/12 figures have not been audited and reporting includes previous year expenditures for projects concluded during FY11/12

Demand Side Management Programs Update

Potential Study 2010

The Los Angeles Department of Water and Power (LADWP) has completed a new Energy Efficiency Potential Study providing the basis for updating energy efficiency targets as well as identifying programs to consider implementing to achieve these goals.

Pursuant to the requirements of AB 2021, the (LADWP) developed and submitted its second set of Board-approved energy efficiency savings goals to the state (California Energy Commission), as follows:

FY	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
GWH	271	291	296	266	116	108	126	224	222	240
MW	36	40	42	40	23	22	24	36	37	41

These updated goals, based on the findings of the new Energy Efficiency Potential Study have been approved by the LADWP Board. It is important to note that the goals adopted for 2011-2020 were adopted on a gross basis as compared to annual program results which are calculated on a net basis. This makes a direct comparison between targets and program results challenging, which LADWP looks to correct in the near future by adopting a clarification that both targets and results will be set and reported in gross savings, with net savings used solely to inform process evaluations and program optimization going forward.

LADWP – Summary of Energy Efficiency Programs, FY2012

LADWP		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	1			34	408			$7	$7
HVAC	Res Cooling	3,851	400	378	182,754	3,075,106	1,954	$379,548	$88,458	$468,006
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting									
Pool Pump	Res Pool Pump	1,901	187	187	1,141,398	11,413,980	6,472	$2,284,928	$189,858	$2,474,786
Refrigeration	Res Refrigeration	24,695	967	967	12,458,893	137,032,112	77,344	$7,775,827	$630,389	$8,406,216
HVAC	Res Shell	216	34	34	51,333	1,026,651	677	$43,209	$30,757	$73,967
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	22,795,382	3,301	3,301	19,278,007	207,133,719	132,458	$3,113,419	$2,925,007	$6,038,426
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	12,230,798	9,309	9,309	43,136,605	510,710,696	301,702	$10,562,932	$4,509,280	$15,072,212
Process	Non-Res Motors	207,847	32	32	145,493	2,182,390	1,396	$16,628	$35,292	$51,920
Process	Non-Res Pumps	1,993			974,178	9,741,784	5,429	$20	$34,168	$34,188
Refrigeration	Non-Res Refrigeration	17,428	143	168	1,752,770	8,081,571	4,584	$105,969	$79,835	$185,804
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	12,398,372	908	908	10,365,353	116,569,256	72,828	$2,718,559	$1,751,729	$4,470,288
Other	Other									
SubTotal		47,682,483	15,280	15,284	89,486,817	1,006,967,673	604,845	$27,001,038	$10,274,782	$37,275,820
T&D	T&D									
Total		47,682,483	15,280	15,284	89,486,817	1,006,967,673	604,845	$27,001,038	$10,274,782	$37,275,820

EE Program Portfolio TRC Test	**2.45**

MERCED IRRIGATION DISTRICT

Merced Overview

- For more than 75 years, the Merced Irrigation District (MID) has been in the business of generating wholesale electrical power.
- Fourteen years ago, MID determined the best way to leverage its investment in low-cost generating facilities, and to benefit Eastern Merced County communities was to develop its own electric delivery system.
- In 1996, MID created the Electric Services Department, and Foster Farms in Livingston, CA became the District's first electric customer.
- MID's electric distribution system has continued to grow with the addition of a 34-mile transmission loop and a sophisticated distribution system supporting customers in Eastern Merced County.
- MID sells electricity generated at its New Exchequer hydro power plant to PG&E under a long-term contract that expires in 2014.

Merced Energy Efficiency Program Highlights

In 2000, MID-Electric Services created and implemented the Public Benefit Programs. These programs promote, assist and educate all electric customers to participate and install energy efficiency measures.

Current Commercial Customer Programs:

- **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.
- **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.

Current Residential Customer Programs:

- **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.
- **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.

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 $2.80/wattAC. The rebate incentive for commercial/industrial solar systems are capped at $70,000 (25kW) and $8,400 (3kW) for residential.

Merced – Summary of Energy Efficiency Programs, FY2012

Merced		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	34	5	5	1,792	21,502	12	$2,550	$189	$2,739
HVAC	Res Cooling	8		1	193	3,517	2	$1,085	$56	$1,141
Appliances	Res Dishwashers	7	1	1	172	1,891	1	$525	$17	$542
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	121	3		2,583	14,326	8	$158	$101	$259
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	35	1	1	5,046	49,735	27	$3,458	$398	$3,855
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	8	1	1	2,197,329	22,333,219	12,178	$311,815	$190,117	$501,932
Process	Non-Res Motors	1			13,913	55,651	30	$10,388	$404	$10,792
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	4,383	35	42	323,740	1,294,961	683	$43,830	$9,418	$53,248
HVAC	Non-Res Shell									
Process	Non Res Process	1			23,024	92,096	50	$2,066	$757	$2,824
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		4,598	45	50	2,567,792	23,866,898	12,990	$375,875	$201,456	$577,331
T&D	T&D									
Total		4,598	45	50	2,567,792	23,866,898	12,990	$375,875	$201,456	$577,331

EE Program Portfolio	TRC Test	**1.26**
	PAC Test	**3.91**

MODESTO IRRGIATION DISTRICT

Modesto Overview

- Established in 1887, the Modesto Irrigation District (MID), located in California's Central Valley, provides electric, irrigation, and drinking water service.
- With more than 110,000 customers, 60 percent of energy sales are commercial/industrial; the remaining 40 percent are primarily residential.
- System Peak Demand: 698 MW in July 2006.
- MID's mission is to deliver superior value to irrigation, electric and domestic water customers through teamwork, technology, and innovation.

Energy Efficiency Program Highlights

2012 Residential Customer Programs

- Overall: Paid over $750,000 in customer rebates and contractor costs for the installation of energy efficiency measures in homes. The net peak load reduction was over 1,300 kW and net annual energy savings was over 2,100 MWH.
- MPower Home: Eligible measures included air conditioners, duct sealing, whole house fans, CFLs, washers, radiant barriers, insulation, and window film/screen.
- LIEE / Weatherization: Eligible measures included low flow showerheads, CFLs, shade screens, minor home repair, oven, microwave and refrigerator replacement. The program also provides education, information and community outreach for low and moderate-income customers.
- Windows of Hope: Collaboration with Habitat for Humanity to fund the replacement of old inefficient windows with new energy efficient windows for low and moderate income homeowners.
- Thermostat Program: Provides, at no charge, either installation of large display thermostats, voice activated thermostats or remote controlled thermostats for low income disabled customers.
- Shade Trees: Working in partnership with other area agencies, MID provides shade trees and planting support to low to moderate income homeowners.

2012 Non-Residential Customer Programs

- Overall: Paid over $732,000 in rebates for the installation of energy efficiency measures in businesses. The net peak load reduction was over 600 kW and net annual energy savings was over 10,800 MWH.
- MPower Business: Eligible measures included air conditioners, lighting, refrigeration, window film/screen, motors and computing.
- MPower Custom: Eligible measures included air compressors, chiller, cooling towers, VFDs, insulation and EMS.
- MPower Commercial New Construction: Eligible measures included air conditioning, lighting, insulation, cooling, skylights and process cooling.
- Energy Efficiency Workshops – Each year MID host technology workshops to demonstrate the best practices in energy efficiency to our commercial customers. The 2012 workshop focused on compressed air systems best practices.

- Tool Lending Library – MID provides an array of technical tools for commercial customers to assist them in evaluating energy saving opportunities. Tools include IR camera, ultrasonic leak detector, lighting loggers, plug in power monitors, 3-phase power monitors and much more.
- Implemented a commercial LED down light program.

2013+ Planned MID Energy Efficiency Programs and Services

- Evaluate the appropriateness for rebate of new, energy efficiency technologies.
- Ensure that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency.
- HVAC Programs -Promote high efficiency mini-split HVAC systems thru a special line item rebate.
- Agricultural Programs -Develop an agricultural irrigation system improvement program that provides incentive for pumping and delivery system improvements.
- Workshops - Sponsor a DOE customer workshop on pumping efficiency.
- Energy Education - MID has updated our Energy 411 program that is utilized in approximately 30 elementary schools to educate 6th grade students on energy resources and energy efficiency. Over 1,800 students will be given LED bulbs to replace existing incandescent bulbs in their homes.

Demand Reduction Program Highlights

Since the early 1980's, MID has continuously operated demand reduction programs. Their purpose is to reduce electricity demand during peak use periods, May through September, when necessitated by operational constraints or supply shortages. Bill discounts are given for both direct load control and curtailable load reduction mechanisms. Following are program highlights for 2012:

- STEP: Bill discounts of over $281,000 for residential and commercial customers participating in the "Shave the Energy Peak" (STEP) program. STEP allows MID operators to reduce electricity demand by cycling over 14,000 air conditioners. The available peak load reduction was 10 MW.
- Interruptible Rate: Bill discounts of over $330,000 for commercial and industrial customer participants. This program allows MID operators, upon customer notification, to reduce electricity demand by requiring cessation of the curtailable portion of customer load. The available peak load reduction was 19 MW.

Energy Efficiency (EE) Funding Sources

MID presently exceeds the required annual funding level for public benefit programs (2.85% of revenue - AB1890/AB995) and has for several years. Over time, low income and renewable energy programs have grown significantly and now comprise the majority of public benefit expenditures, which has led MID to fund EE from both public benefit and procurement sources. MID's 2012 EE funding from public benefits and procurement was approximately $1,412,000 and $1,483,000, respectively. Essentially, MID uses public benefit dollars for the non-incentive components of EE program costs and procurement dollars for the customer incentive component of EE program costs.

Evaluation, Measurement & Verification (EM&V) Activities

In 2012, MID made continued efforts to obtain independent, third-party review of its EE programs. MID has hired Power Services, Inc. (CVMP qualified) to perform M&V, at the time of rebate submission, on selected larger projects throughout the year. MID also hired Robert Mowris and Associates to conduct an annual M&V report on MID's 2011 energy efficiency programs. We expect for work to begin work with our consultant on the 2012 annual M&V report in the immediate future.

Smart Grid Activities

MID continued its development of a smart grid. MID has 100% advanced metering infrastructure (AMI) implemented across its service area, which exceeds 100,000 meters. MID installed equipment at one substation for its distribution system automation project that is intended to control end-of-line voltage. MID also plans to launch in mid-2013 an enhanced business customer web portal to allow business customers to see timely usage and load data along with other features to allow them to better control their electrical bills.

These projects received approximately $1.5 million ARRA Smart Grid Investment Grant and also qualified for a CEC PIER grant. In addition, MID prepared and adopted a Smart Grid Deployment Plan (per SB17). For 2013, MID will continue implementing the SGIG funded projects.

Modesto – Summary of Energy Efficiency Programs, FY2012

Modesto		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	428	58	58	22,556	270,667	150	$14,980	$2,717	$17,697
HVAC	Res Cooling	1,290	787	328	199,051	3,677,448	2,274	$348,091	$62,109	$410,200
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics	99			7,425	111,375	62	$10,975	$1,309	$12,284
HVAC	Res Heating									
Lighting	Res Lighting	4,904	264	36	236,471	3,452,720	1,843	$51,836	$30,482	$82,317
Pool Pump	Res Pool Pump	38	2	2	8,417	84,166	46	$7,600	$787	$8,387
Refrigeration	Res Refrigeration	340	25	25	204,619	2,148,296	1,165	$138,707	$22,340	$161,047
HVAC	Res Shell	2,741	912	912	1,427,107	27,858,261	15,817	$150,933	$337,372	$488,304
Water Heating	Res Water Heating	109			8,080	93,368	50	$2,763	$914	$3,678
Comprehensive	Res Comprehensive	50			16,652	249,780	126	$25,000	$1,858	$26,858
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	134	94	55	644,737	9,670,546	5,366	$63,662	$69,023	$132,685
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	7,624	422	346	2,106,414	22,945,847	12,644	$153,843	$164,016	$317,859
Process	Non-Res Motors									
Process	Non-Res Pumps	1	4		11,786	176,784	96	$1,031	$1,110	$2,142
Refrigeration	Non-Res Refrigeration	9,682	968	138	7,419,655	104,901,232	55,305	$419,314	$651,785	$1,071,099
HVAC	Non-Res Shell	3,240	57	72	127,072	1,685,906	1,002	$38,555	$17,418	$55,973
Process	Non Res Process	3	62	72	490,954	7,364,316	4,019	$56,474	$49,627	$106,101
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		30,683	3,655	2,044	12,930,995	184,690,712	99,964	$1,483,763	$1,412,868	$2,896,631
T&D	T&D									
Total		30,683	3,655	2,044	12,930,995	184,690,712	99,964	$1,483,763	$1,412,868	$2,896,631

EE Program Portfolio TRC Test	**1.76**

MORENO VALLEY UTILITY

Moreno Valley Overview

- The City of Moreno Valley incorporated in 1984 and established a municipal utility in 2001. Moreno Valley Utility (MVU) began serving its first customers in February 2004. MVU serves residential, commercial, and industrial customers. MVU has the potential to expand its customer base significantly in the next 10 years.
- Moreno Valley Utility currently serves over 5,600 customers. Residential customers comprise the majority of the energy customers, however, residential energy sales account for about 31% of total sales.
- All customers' facilities are nine years old or less, occupying buildings that meet Title 24 requirements. This results in a lower Energy Efficiency Potential.
- Peak Demand: 32.5 megawatts
- Annual Energy Use: 116.1 gigawatt-hours
- Mission: Moreno Valley Utility strives to provide reliable, economical, and safe electric distribution service to benefit the community and the City.

Moreno Valley Utility Energy Efficiency Program Highlights

In FY 11/12, Moreno Valley spent approximately $3,000 in incentives to increase energy efficiency for the community. This amount was spent on customer incentive payments.

Current Customer Programs and Projects (2011-2012)

- Energy Efficiency Program: Moreno Valley Electric Utility offers incentives to developers for buildings that exceed California Title 24 requirements by more than 10 percent. The utility also offers rebates for existing commercial customers that retrofit above Title 24 requirements.
- Energy Audits**:** Provides customers with a variety of recommendations for reducing energy consumption, when requested. Audits can be provided by community organizations that increase awareness of existing energy efficiency programs.
- Residential Energy Efficiency Programs: MVU held direct-to-customer CFL Giveaways during the reporting period.
- 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.

Proposed Energy Efficiency Projects and Services (2012-2013)

- Residential and Small Commercial Energy Efficiency Programs: All homes and businesses within the service territory are less than ten years old, which make it difficult to offer building envelope upgrades. MVU is developing innovative programs to encourage energy efficiency. These include direct-to-customer CFL Giveaways, and Direct Install programs.
- Assembly Bill 811: The City of Moreno Valley has signed an Implementation Agreement with the Western Riverside Council of Governments (WRCOG) in support of Property Assessed Clean Energy (PACE) Financing for Renewable Energy Distributed Generation and Energy Efficiency Improvements. WRCOG began implementing programs for residential and commercial projects in late 2011. The program has been very successful so far for member agencies.

- Ross Distribution Center Energy Efficiency Projects: MVU is continuing to work with one if its largest customer in exploring projects to reduce annual energy consumption and reduce their peak demand significantly. The company is reviewing a lighting upgrade program that will offer significant energy savings.
- Highland Fairview Corporate Park: Highland Fairview developed a 1.8 million square foot distribution warehouse which was approved for LEED gold certification in December 2012. MVU is continuing to work with Highland Fairview in maximizing energy efficiency on all their future projects in this area.

Demand Reduction Programs

- Ice Bear Thermal Energy Storage: The City of Moreno Valley has contracted with Ice Energy to install Ice Bear TES units on commercial customers' air conditioners. In general, thermal energy storage is growing increasingly popular for public power utilities located in areas that have high summer peak demand usage, such as the City of Moreno Valley. The product is designed to reduce peak electrical demand by utilizing electric energy to produce ice at night during off-peak hours and then use the ice for cooling during the day.

Renewable Energy Programs:

- Moreno Valley Utility Solar Rebate Program: In support of Senate Bill 1, the City of Moreno Valley has a generous solar rebate program. For the fiscal year 2011/2012 the utility provided $217,700 in rebates for 10 residential customers and 1 commercial customer. The rebate for the fiscal year was $2.80/watt and the program installed almost 78kW of generation, estimating to generate over 135,500 kWh annually.

Evaluation, Measurement and Verification:

Engineering analysis programs, such as DOE-2, are the basis for calculated energy savings and incentive calculations.

Moreno Valley – Summary of Energy Efficiency Programs, FY2012

Moreno Valley		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling									
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	280	12	2	9,996	52,979	30	$1,081		$1,081
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	8	4	2	22,200	177,600	99	$2,426		$2,426
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		288	16	4	32,196	230,579	129	$3,507		$3,507
T&D	T&D									
Total		288	16	4	32,196	230,579	129	$3,507		$3,507

EE Program Portfolio	TRC Test	**2.67**
	PAC Test	**5.92**

CITY OF NEEDLES

Needles Overview

- 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 2,991 meters, serving 2,559 residential customers, 469 commercial customers, 37 commercial demand customers, and 4 master metered and 1 municipal customers.
- Total energy sales are 53,505,038 kilowatt-hours (FY 2011-12); 46.6 percent is residential sales, 53.4 percent is commercial and the remainder is master metered and municipal sales.
- Approximately 47% of Needles power comes from hydroelectric
- Peak demand is 19.1 megawatts
- 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.

Needles Energy Efficiency Program Highlights

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 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"*

The City of Needles' energy efficiency programs are designed to reduce the summer air conditioning loads and increase the annual load factor. In FY 2010-11, the City of Needles' energy efficiency programs reduced peak demand by 178 kilowatts and 177,814 kilowatt-hours Western Area Power Authority approved Integrated Resource Plan Annual Progress Report for 2012). *Note: 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).

Note: At FYE 6/30/2011 the total combined residential and commercial usage was 55,245,174 kilowatt hours. At FYE 6/30/12, the combined residential and commercial usage was 53,505,038 kilowatt hours, a decrease of 1,740,136 kilowatt hours or 3.1498426%.

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.

Current Residential Customer Programs:

- Air conditioner, evaporative cooler, refrigerator replacement with SEER 14 or higher with proof of home weatherization completed.
- 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.

Proposed City of Needles Energy Efficiency Programs and Services: **(FY 2012-13)**
Maintain Existing Programs at current levels and monitor effectiveness for potential expansion (finances allowing). Planned activities include continuation of the *"Get a Tree for Free"* program whereby, the City will fund $2,500.00 ($25.00 per tree plus sales tax) to have residents purchase up to 3 trees each at the local nursery. Once they bring their sales slip in and Code Enforcement verifies that the trees have been planted on the appropriate elevation of the home to optimize shade value, the customer's electric bill will be credited for the amount that the resident paid for the tree(s).

Needles Demand Reduction Programs:
The City of Needles demand reduction program reduction target calls for 0.2MW for FY 2012-2013.

Needles – Summary of Energy Efficiency Programs, FY2012

Needles		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling	35	3	7	6,824	122,828	78	$164,063		$164,063
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		35	3	7	6,824	122,828	78	$164,063		$164,063
T&D	T&D									
Total		35	3	7	6,824	122,828	78	$164,063		$164,063
EE Program Portfolio TRC Test		4.49								

CITY OF PALO ALTO UTILITIES

Palo Alto Overview

The City of Palo Alto Utilities (CPAU) is the only municipal utility in California that operates city owned utility services that provide electric, natural gas and water services to its customers. It serves about 29,000 electric customers. It has a peak load of 189 megawatts with sales of about 1,040 gigawatt hours annually. CPAU successfully met its Fiscal Year (FY) 2011 efficiency savings goals for electricity and natural gas. CPAU has many demand-side management goals for all its utilities that are designed to support the City's environmental and sustainable policies.

The City of Palo Alto Utilities (CPAU) is committed to supporting environmental sustainability in the community by assisting all customers to reduce consumption of electricity, natural gas and water resources. This is accomplished through ongoing innovative, cost-effective customer programs, services and incentives.

Since 2005, significant amounts of electricity (kilowatt hours), natural gas (therms) and water (CCF) have been reduced through utility-funded programs. In addition to the large levels of savings supported by rebates, education and other programs, the community continues to reap savings benefits from new state and federal codes and standards—making sure that new equipment and appliances are increasingly more efficient in every home and place of business.

This achievement is attributed to the increased number of programs available for all customer types, as well as an expansion of programs administered by third party agencies. Such third party program administration enhances the City's ability to set and achieve greater efficiency goals while freeing up staff and other resources for additional programs and projects.

Palo Alto Programs

Business customers use the vast majority of electricity in Palo Alto, so it is no surprise that business efficiency program savings represent about 90% of CPAU's total electric efficiency savings. The programs with the greatest impact this year for electric energy efficiency came from three sources: business lighting (about 31% of the total), business process (primarily a single large datacenter project at 22% of total savings) and business heating, ventilation and air conditioning or HVAC (also primarily from the datacenter project at 19% of total savings).

The residential programs for the electric utility with the greatest impact include the Home Energy Reports (HERs), at about 8% of total savings and residential lighting, at 2% of the total portfolio savings. Savings for the HERs were an even greater portion of the natural gas portfolio achievements.

The largest fraction of expenditures in the electric efficiency budget are for third party administered contracts and rebates. Some of these contracts, particularly for those targeting hard-to-reach groups (Residential Energy Assistance Program and Right Lights+), include rebate payment as a part of the program administration. This arrangement tends to make the contract costs appear more costly than CPAU-administered custom incentive payments. Costs, for in-house salaries, marketing, customer education and other types of expenses, are the smallest segment of program budgets. Three programs,

Solar Water Heating, Right Lights+ and the Business Zero Interest Efficiency Loan Program, were partially paid for out of supply funds. The contractor for Evaluation, Measurement and Verification (EM&V) was also paid from supply funding. The remainder of the funding for electric efficiency programs came from the mandated Public Benefit Charge, which is set at 2.85% of the customer retail rate. The majority of the Public Benefit funds are spent on efficiency programs; however, some funding also goes to renewable energy projects, researching innovative technologies and low income efficiency programs.

Program Results

Palo Alto benefited from a very large datacenter upgrade from the one such facility in town. This achievement is not easily replicable due to the unique nature of the savings. As has been the case for the past few years, the Solar Water Heating program is not meeting the program target of 500 residential systems and 100 pool heating systems. CPAU is mandated by California law (AB 1470; 2007) to offer this program, but solar water heating is still not cost-effective due to depressed natural gas prices in the past few years. State law also disallows utility rebates for solar pool systems. Solar electric (or PV) programs, on the other hand, remain on target, particularly for residential installations. The residential portion of the program reached the end of its original 10 blocks this year; however, since small commercial customers were not installing PV systems at a high rate, some of this funding was transferred to the residential group to allow two additional rebate blocks. The chart below shows results in FY 2012 by major program area.

	Units Installed	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Net Demand Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	PAC	TRC
TOTAL EE PORTFOLIO	**1,852,984**	**14,807,235**	**188,218,218**	**1,241**	**12,668,792**	**160,372,380**	**4.1**	**2.3**
COM-Com. Advantage Rebates	1,823,850	2,311,377	5,653,664	132	1,957,817	4,745,782	1.5	1.4
COM-Right Lights Plus	345	3,381,531	38,091,366	447	2,842,504	32,062,204	1.7	1.3
RES-Home Energy Report*	20,000	955,000	955,000		955,000	955,000	0.2	0.2
RES-REAP (Low Inc EE)	2,279	167,564	1,244,372	20	136,875	995,199	0.2	0.2
RES-Smart Energy Rebates	2,967	405,858	4,244,681	176	294,080	3,164,535	1.1	0.3
GEN-Gen T&D (not included in reported savings in CMUA total)	2	367,000	8,448,500	24	367,000	8,448,500	126.5	1.0
COM-Water (Energy Effects)	1	91	1,092		73	874	0.2	0.1
COM-Enovity Commercial & Industrial EE	21	6,434,592	124,136,040	367	5,469,403	105,515,634	7.3	3.7
COM-Keep Your Cool	1,286	165,196	908,218	26	138,754	745,693	1.2	1.2
COM-Hospitality Sector	2,233	619,027	4,535,285	49	507,286	3,738,959	3.4	2.9

**The Home Energy Report includes start-up costs and is cost-effective on an ongoing basis.*

CPAU Program Summaries

RESIDENTS

Education and Workshops

A variety of programs are held throughout the year held in the spring near Earth Day and later in the "Summer Workshop Series." Monthly open houses of the EcoHome are available.
www.cityofpaloalto.org/Workshops

Green@Home

CPAU offers free in-home audits through a program coordinated by Acterra, a local, non-profit, volunteer environmental organization.
www.acterra.org/programs/greenathome

Home Energy Reports

CPAU provides residents with individualized reports comparing their home energy use with that of 100 similarly sized homes. A web portal also offers tips and suggestions on reducing electric and natural gas usage.
www.cityofpaloalto.org/HomeEnergyReports

Loan Program

Coordinating with industry leader, Electric and Gas Industries Association (EGIA) and local contractors, CPAU offers interest free loans to residents installing qualifying efficiency and home comfort measures.
www.egia.org/PaloAlto

Residential Energy Assistance Program (REAP)

The City provides low-income residents---at no cost---home lighting and heating system upgrades as well insulation for walls and roofs and weather-stripping for doors and windows.
www.cityofpaloalto.org/LowIncome

Smart Energy Program

The City gives financial rebates to residents who install energy efficient appliances and equipment in their homes or on their property. Palo Alto pays rebates to those who have their older model, inefficient refrigerators and freezers recycled through a City program.
www.cityofpaloalto.org/SmartEnergy

Water Programs

Through a partnership with the Santa Clara Valley Water District (SCVWD), Palo Alto provides residents with programs to improve their water use efficiency. These programs include free indoor and outdoor home water surveys, as well as many rebates.
www.cityofpaloalto.org/ResiWater

Residential New Construction Rebate

CPAU offers a financial incentive to encourage residents to exceed minimum building efficiency codes when constructing a new home. Rebates are available for up to $3,000.
www.cityofpaloalto.org/ResRebate

BUSINESS CUSTOMERS

Commercial Advantage Program
Business customers are offered rebates for a wide variety of efficient equipment.
www.cityofpaloalto.org/CommercialAdvantage

Commercial and Industrial Energy Efficiency Program
Large businesses can get help with building commissioning. This assistance includes systems and their operating specifications. Customers are assisted in obtaining rebates.
www.cityofpaloalto.org/CIEEIP

Commercial and Industrial Water Program
CPAU partners with the SCVWD to provide non-residential customers with free landscape irrigation audits, direct installation of high-efficiency toilets and rebates.
www.cityofpaloalto.org/ComWater

Keep Your Cool
Commercial kitchens receive a free, no-obligation, inspection of commercial refrigerators and coolers to evaluate their efficiency. Generous cash incentives are available to make efficiency upgrades affordable for a variety of equipment.
www.cityofpaloalto.org/CommercialPrograms

Hospitality Program
Rebates and assistance are offered to hotels on a variety of efficiency measure installation, including lighting and key card controls for lighting, air conditioning and plug loads that reduce power use when rooms are unoccupied.
www.cityofpaloalto.org/CommercialPrograms

Labs Efficiency
This program targets research facilities and labs to provide assistance with reviewing systems and their operating specifications for potential savings opportunities, as well as implementing the retrofits.
www.cityofpaloalto.org/CommercialPrograms

New Construction Assistance
Architects and businesses are trained in how to achieve efficiency savings in Palo Alto. Those going through the permitting process get assistance with making upgrades to their systems and obtaining rebates for this energy savings.
www.cityofpaloalto.org/CommercialPrograms

Palo Alto Clean
Large solar installations can sell solar generated electricity directly to the utility at a fixed price over a long term. This is called a “CLEAN” or Feed In Tariff (FIT) program.
http://www.cityofpaloalto.org/PAClean

Right Lights+ Program
Through this program, small businesses receive extra assistance in implementing efficiency through onsite audits and rebates on a variety of lighting and other upgrades.
www.rightlights.org

Zero Interest Loan Program
This program provides businesses with no-interest loans to install electric energy efficient equipment. Loans can be up to 5 years in length and for between $5,000 and $50,000.
www.cityofpaloalto.org/CommercialFinancing

ALL CUSTOMERS
Building Benchmarking Program
Assists businesses with benchmarking their facilities through the ENERGY STAR® Portfolio Manager from the U.S. EPA. High scores make a business owner eligible for the Mayor's Green Leader award.
www.cityofpaloalto.org/CommercialPrograms

PaloAltoGreen
Allows customers to voluntarily help to finance renewable energy systems.
www.cityofpaloalto.org/PAGreen

PV Partners
Provides rebates for installing solar electric (or photovoltaic/PV) systems and then "net meter" their usage.
www.cityofpaloalto.org/PVPartners

Solar Water Heating
Incentives provided for installing solar water heating for domestic use.
www.cityofpaloalto.org/SWH

Program Budgets
Since CPAU began recording its electric, natural gas and water efficiency and program expenditures separately in Fiscal Year 2006, the majority of program funds have been expended for efficiency and renewable efforts, with lessor amounts going to low income, research and development, and other customer marketing and educational activities. The table below summaries these funding percentages for all three utilities:

R&D	Efficiency	Renewable Energy	Low Income	Admin	Customer Account Mgmt
0.85%	57.88%	27.00%	3.39%	5.46%	5.41%

Greenhouse Gas Emissions Reductions
The City of Palo Alto Climate Protection Plan counts on CPAU's electric efficiency goals to meet its sustainability goals. CPAU has a 2020 goal of achieving a reduction of 15,800 tonnes of CO_2. At the close of 2012, Palo Alto was ahead of schedule and has already achieved a cumulative reduction of 13,376 tonnes of CO_2.

Efficiency, Measurement, and Verification
Palo Alto has provided efficiency services for decades to local residents and businesses. However, the portfolio has become increasingly complex, broad based and well documented since the 1990's. After

SB1037 was passed in 2005, CPAU began enhancing its tools for identifying efficiency potential, reporting program savings and verifying these savings. Due to state law and available joint action groups' capabilities in this area, the electric utility has the most sophisticated models for reporting.

KEMA, Inc (KEMA) and Energy and Environmental Economics (E3) have provided public power with the expertise to develop resources that allow all California publicly owned utilities (POUs) to measure energy efficiency program effectiveness and to report program savings in a consistent and comprehensive manner. Palo Alto is working with the consulting group ERS, Inc. to develop a Technical Resource Manual. This TRM will update the deemed energy savings information in the outdated KEMA study and provide tables for standard energy calculations in Climate Zone 4.

The E3 Reporting Tool is a sophisticated Excel spreadsheet model used to report the results of utility electric energy efficiency programs. The model contains a database of around 250 unique energy savings measures. The 2010 E3 Reporting Tool was used to report program results for this year.

EM&V Reports have been completed for CPAU by Navigant Consulting (previously Summit Blue) for every year since Fiscal Year 2008. Reports have been completed on the following programs:

Process Reports:

Smart Energy Program (Residential Rebates)	FY 2008
Commercial Advantage Program (Business Rebates)	FY 2008
Smart Energy Program (Residential Rebates)	FY 2009
Right Lights Plus (Business Lighting)	FY 2009
Net to Gross Evaluation for all programs	FY 2010
Washing Machine Rebates	FY 2011

Impact Reports:

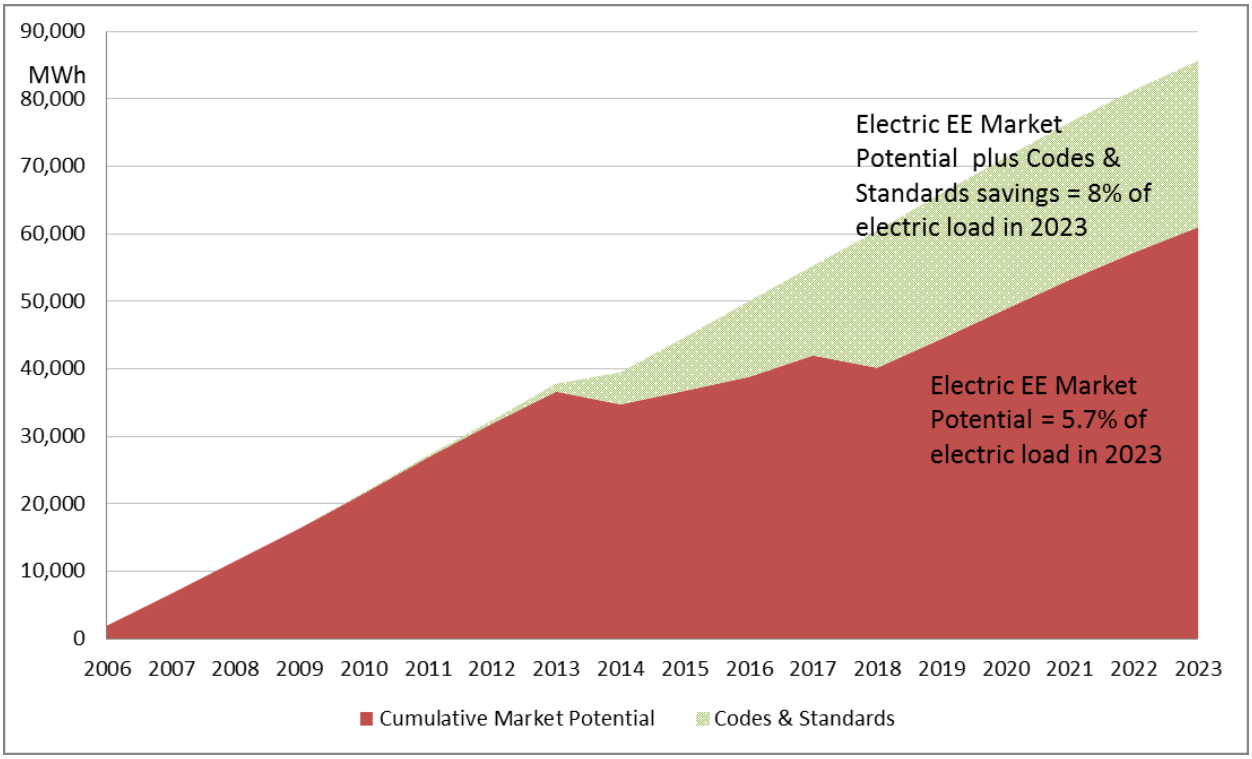
Residential Refrigerator/Recycling Program	FY 2008
Compact Fluorescent Light Programs	FY 2008
Right Lights Plus (Business Lighting)	FY 2008
Custom Energy Rebate (Business Customers)	FY 2008
Commercial Advantage Program (Business Rebates)	FY 2009
Right Lights Plus (Business Lighting)	FY 2009
Commercial Advantage Program (Business Rebates)	FY 2010
Right Lights Plus (Business Lighting)	FY 2010
Home Energy Reports	FY 2011
Commercial Advantage Program (Business Rebates)	FY 2011
Commercial and Industrial Efficiency Program (Process)	FY 2011

All of these reports are available on the NCPA website. EM&V reports for FY 2012 are still in development and should be completed by April 2013. They will be available on the NCPA website once received and approved.

Energy Efficiency Goals and Potential Study

CPAU worked with Navigant Consulting to update its 2007 and 2010 electric and natural gas efficiency potential studies and to develop new 10-year goals for efficiency results. On November 14, 2012, City

Council approved the updated potential study and efficiency goals. The new ten-year electric EE program goal is to save a cumulative 4.8% of the City's projected electric usage between 2014 and 2023. The City's cumulative electric savings since 2006, as a result of both EE program achievements and changes to appliance codes and building standards, will be 8%, based on load projections, by the year 2023.
As can be seen on the chart below, new codes and standards continue to provide great energy efficiency results, but do limit the capability of the utility's programs to count and report these savings.



Historical Achievements and Approved Goals for CPAU's Electric Efficiency Programs

Palo Alto – Summary of Energy Efficiency Programs, FY2012

Palo Alto		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	435	55	55	57,473	689,674	381	$54,375	$202	$54,577
HVAC	Res Cooling	11	2	2	4,621	113,219	69	$2,615	$75	$2,690
Appliances	Res Dishwashers	246	22	22	8,364	92,004	51	$12,300	$27	$12,327
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	3,217	69	27	216,734	2,006,654	1,071	$64,942	$17,096	$82,038
Pool Pump	Res Pool Pump	8			7,342	73,416	40	$1,600	$26	$1,626
Refrigeration	Res Refrigeration	424	25	25	115,633	780,720	424	$23,658	$2,285	$25,943
HVAC	Res Shell	905	22	22	20,789	404,047	242	$120,416	$7,205	$127,620
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	20,000			955,000	955,000	510		$188,263	$188,263
Process	Non-Res Cooking	3	3	3	11,623	112,955	62	$1,400	$39	$1,439
HVAC	Non-Res Cooling	36	297	297	2,285,354	45,651,418	27,781	$278,392	$317,455	$595,847
HVAC	Non-Res Heating	1			867	17,340	11	$128	$114	$242
Lighting	Non-Res Lighting	50,630	614	543	3,648,904	37,878,323	20,994	$446,023	$521,629	$967,652
Process	Non-Res Motors									
Process	Non-Res Pumps	2	1	1	59,616	1,192,312	629	$7,014	$3,201	$10,214
Refrigeration	Non-Res Refrigeration	1,920	35	33	254,515	1,210,134	646	$28,989	$722	$29,711
HVAC	Non-Res Shell	7			466,650	5,649,525	3,438	$54,900	$38,965	$93,865
Process	Non Res Process	2	71	71	2,679,443	53,588,274	32,611	$315,420	$353,495	$668,915
Comprehensive	Non Res Comprehensive	1,775,135			1,508,865	1,508,865	918	$177,514	$1,344	$178,857
Other	Other									
SubTotal		1,852,982	1,217	1,101	12,301,792	151,923,880	89,876	$1,589,685	$1,452,143	$3,041,828
T&D	T&D	2	24	24	367,000	8,448,500	4,409		$4,224	$4,224
Total		1,852,984	1,241	1,125	12,668,792	160,372,380	94,285	$1,589,685	$1,456,367	$3,046,051

EE Program Portfolio TRC Test	**2.45**

PASADENA WATER & POWER

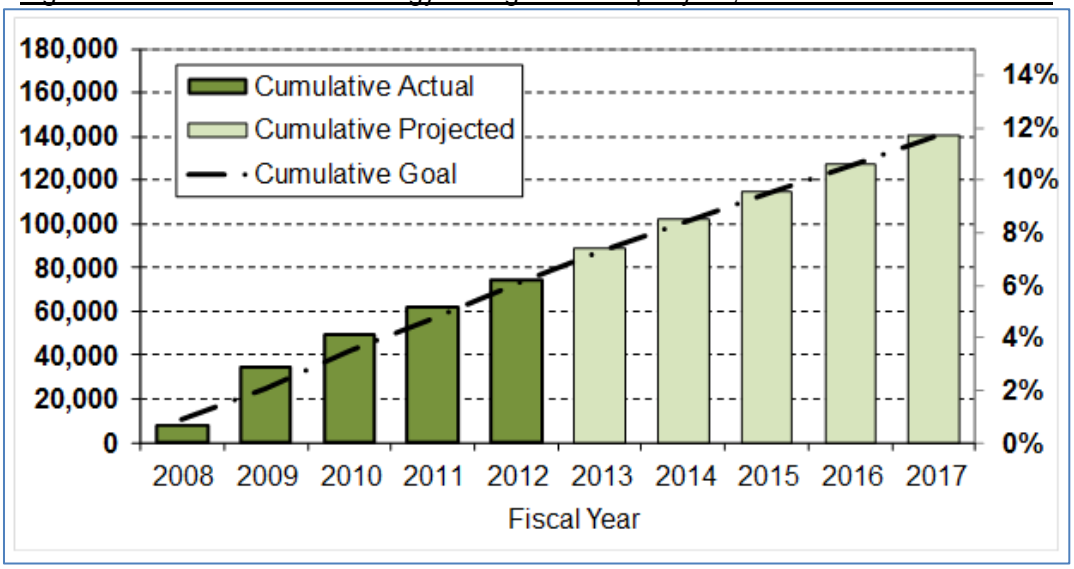
Pasadena Overview

Pasadena Water and Power ("PWP") has consistently adopted and implemented aggressive energy efficiency goals, totaling 74,971 MWh, or 6.1 percent of retail sales for the five fiscal years from FY07/08 through FY11/12. During this period, annual energy efficiency spending averaged $3,678,000 per year, or 2.07% of electric retail revenues.

For the current FY11/12 reporting year, PWP's energy efficiency programs saved 13,337 MWh (1.2% of retail sales) and reduced peak demand by 2.6 MW (0.85% of peak demand) at a total cost $3,412,308 (1.84 % of revenues).

On January 28, 2013, the Pasadena City Council adopted new ten-year energy efficiency goals for FY13/14 through FY22/23 of 12,750 MWh per year load reduction, 2.3 MW per year demand reduction, or about 1% of retail sales and 0.7% of peak demand on average. As shown in Figure 1, if PWP meets the next four years of these goals, the cumulative annual energy savings from energy efficiency programs over the first ten years since the enactment of AB-2021 (2006) will have reached over 140,000 MWh per year, or 12% of average retail sales during this period.

Figure 1: Cumulative annual energy savings in MWh per year, or % of electric retail sales



Background

Established in 1906, community-owned PWP is a department within the City of Pasadena ("City") and provides electric service to more than 64,836 metered accounts over a 23 square-mile service area. PWP is committed to providing safe, high quality and reliable water and power with superior customer service at reasonable and competitive rates. The electric division of the utility recorded the following statistics in Fiscal Year 2011/2012 (period from July 1, 2011 through June 30, 2012, aka "FY11/12"):

- Peak energy demand was 307 megawatts ("MW")
- Retail electric energy sales were 1,114,111 megawatt-hours ("MWh")

- Retail electric sales revenue was $176,987,596
- Residential metered accounts are 56,311
- Non-Residential metered accounts are 8,525

Energy Efficiency Program Mission

The overall mission of PWP's customer programs is to promote energy efficiency and water conservation through extensive public outreach, education, and rebate programs. The mission of PWP's portfolio of energy efficiency programs is to promote the use of socially and environmentally responsible energy efficient measures and customer assistance programs for the benefit of all Pasadena residents and business customers. Specifically, the portfolio strives to attain the following goals:

- Meet or exceed energy efficiency goals established by the Pasadena City Council, as demonstrated in Figure 1, to implement all cost-effective energy efficiency prior to procuring supply-side resource
- Identify cost-effective energy-saving opportunities, and provide solutions to help customers achieve reductions in their electric bills.
- Provide direct assistance to qualified customers who are unable to implement cost-saving energy efficiencies on their own.
- Introduce sustainable concepts and operational practices to customers to reduce the energy consumption and environmental impacts of buildings.
- Demonstrate and evaluate new and emerging technologies which encourage market transformation of electrical equipment to increase energy efficiency as well as reduce peak electric system demand.

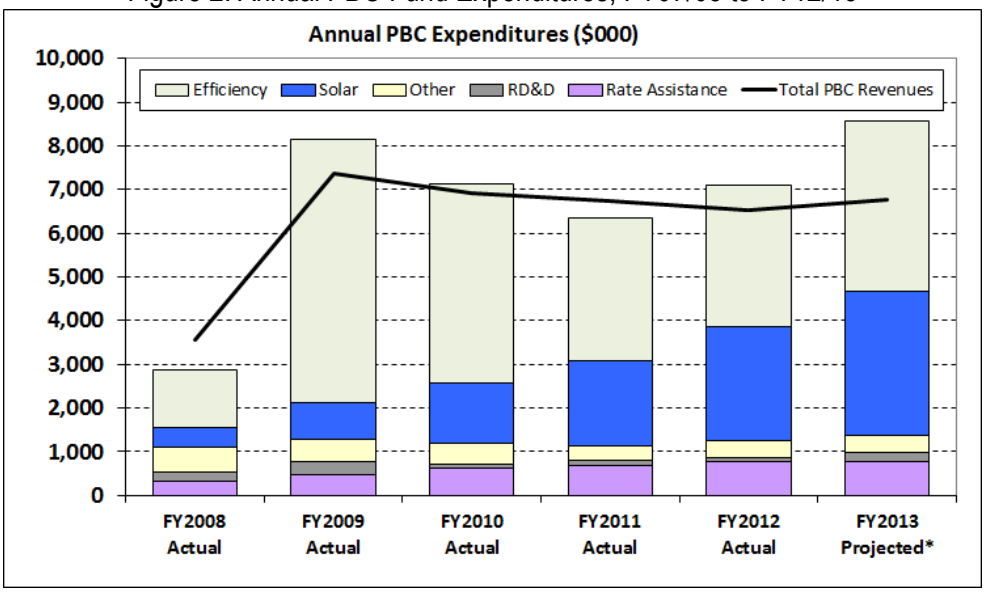
Funding Energy Efficiency Programs

Pasadena electric customers pay a Public Benefits Charge ("PBC") to fund energy programs, as authorized under Public Utilities Code 385(a). These programs cover the five program categories authorized under AB1890, including a) energy efficiency and demand reduction, b) low income rate assistance, c) renewable resource, d) research, development and demonstration ("RD&D") of emerging technologies and e) other (program administration, marketing, support, and evaluation, measurement and verification.) When PWP enacted the PBC charge in 1996, the rate was $0.00271 per kilowatt-hour ("kWh") sold to meet the minimum 2.85 percent of retail electric sales as required under AB1890. The PBC rate has been $0.00573 per kWh since 2009 and generated approximately $6.5 million in FY11/12 revenue. Figure 2 displays the increased program expenditures, by AB1890 category, since the 2009 rate was established.

PWP spent 3.81 percent of its retail electric sales on all Public Benefit funded programs in FY11/12. The amount PWP spent on energy efficiency programs was 1.84 percent of FY11/12 retail electric sales. Of PWP's total Public Benefit Charge expenditures in FY11/12 for all programs, the following represent the share of the fund spent on each of the program categories:

- 39.65 % Energy Efficiency
- 15.22 % Low-income Rate Assistance
- 37.07 % Renewable Energy Resource
- 1.29 % Research, Development and Demonstration of Emerging Technology
- 6.77 % Other (Program Administration, Program Support , EM&V)

Figure 2: Annual PBC Fund Expenditures, FY07/08 to FY12/13



Pasadena Environmental Goals

PWP supports the City of Pasadena's environmental goals to secure sustainable resources and minimize environmental impacts of water and power procurement. In 2006, the City adopted the United Nations Urban Environmental Accords. PWP's activities directly impact six of the 21 Urban Environmental Accords action items including energy efficiency, renewable resources, greenhouse gas emissions, water conservation, tree canopy, and clean vehicles. One of these goals calls for a 10% electric system demand reduction by 2012 through energy efficiency and conservation measures. In addition, the City amended its Green Building Ordinance by adopting the 2010 California Building Codes, Green Building Standards and Residential Codes with higher-than-required standards that incorporate energy and water efficiency measures into the design, construction and maintenance of public and private buildings including residential housing.

Electric Energy Efficiency Goals

In 2007, the City adopted its first ten-year efficiency goals. In 2010, the City adopted revised energy efficiency goals of 12% by 2020 in accord with AB2021's three-year cycle review requirement. PWPs PBC budget funds programs to meet the 2010 goals. In 2012, PWP analyzed the remaining cost-effective energy efficiency potential for Pasadena and projected a 9% savings over ten years. The Pasadena City Council adopted revised ten-year goals of 10% by 2023, matching the State goal. The annual goal for Pasadena beginning with FY13/14 will be 12,750 MWh per year energy savings, and 2.3 MW per year peak demand reduction.

California AB2777 adjusted the AB2021 schedule for revising ten year efficiency goals to a four year cycle, with the next revision due in 2017. The 2008-2017, 2011-2020, and 2014-2023 adopted energy efficiency goals as well as the 2013 cost-effective and achievable energy efficiency potential for Pasadena are displayed in Figure 3. Figure 4 displays the cumulative effects of PWP's efficiency program results on

forecasted energy consumption and thus the reduced need for energy generation in Pasadena through 2023.

Figure 3: Original 2007, Current 2010 and Revised 2013 Adopted Energy Efficiency Goals, with 2013 Market Potential for Energy Efficiency in Pasadena (MWh)

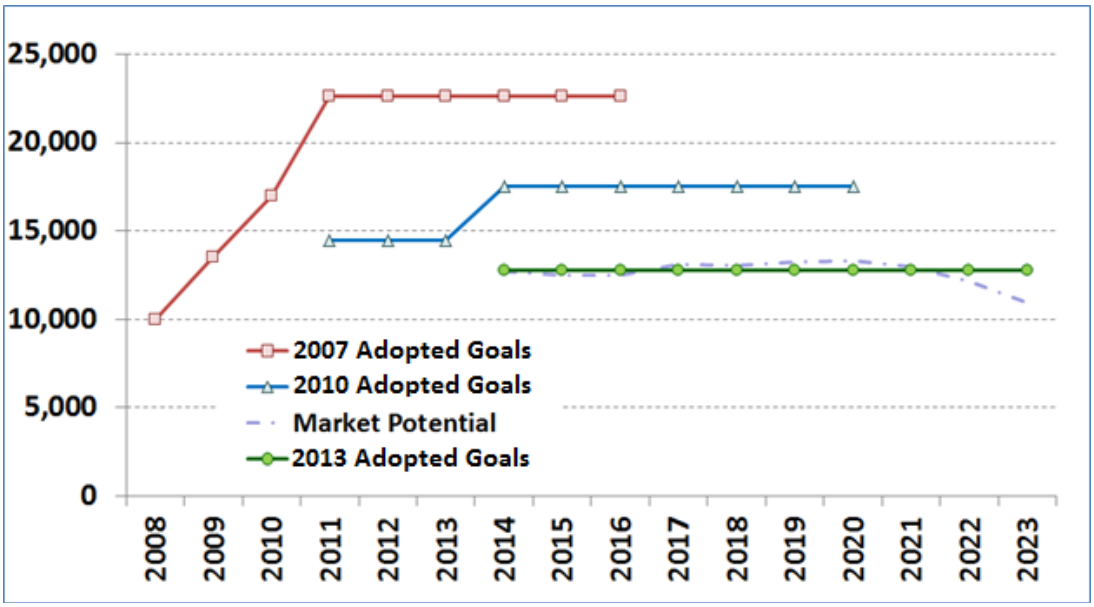
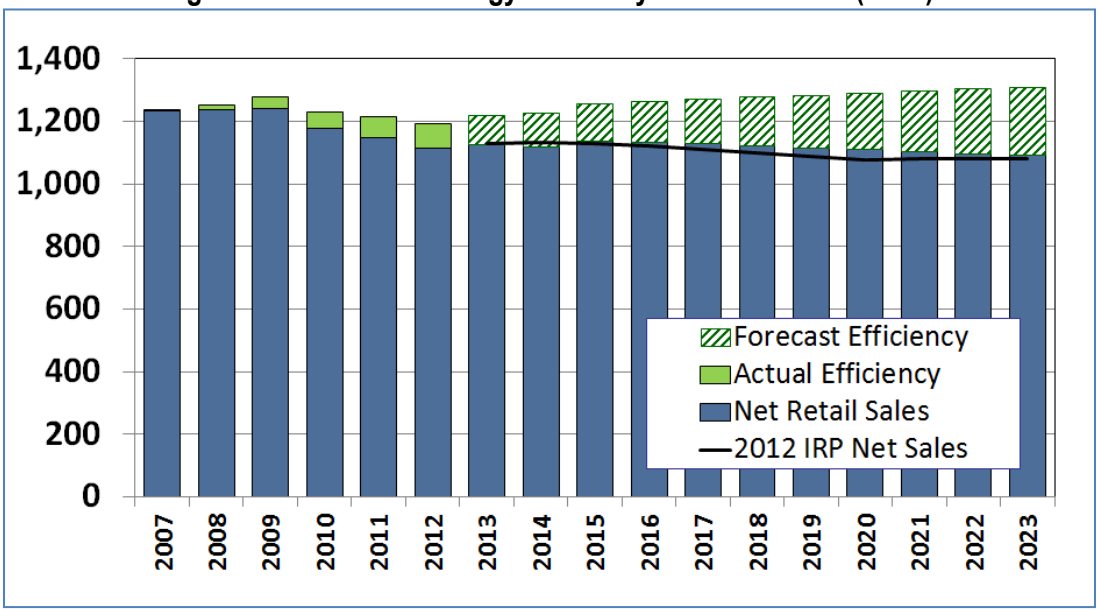


Figure 4: Cumulative Energy Efficiency vs. Retail Sales (GWh)



Energy Efficiency Program Results

PWP's FY11/12 energy efficiency program expenditures were $3,412,308 (1.84 percent of PWP's total electric retail rate revenues). These expenditures were for customer programs which produced first year

energy savings from PWP's Public Benefit Programs and Water Conservation Programs which impact PWP's electric distribution system. Highlights of PWP's FY11/12 energy efficiency program activity include:

- Residential efficiency programs provided 9,363 energy efficiency product rebates and distributions, saving customers 3,548,130 kWh per year and reducing system peak demand by 354 kW.
- Commercial efficiency programs provided 165 energy efficiency product rebates saving 9,521,743 kWh per year and reducing peak system demand by 2,180 kW.
- Water efficiency programs saved 15.6 million gallons, resulting in 266,873 kWh annual water distribution system energy savings (shown on the E3 as "Non-Res Pumps"); PWP's Public Benefit Fund provided $40,031 to PWP's Water Conservation Fund for the value of these savings.
- Energy efficiency and demand reduction from all of the programs total 13,336,766 kWh and reduced peak energy demand by 2,535 kW. A summary of FY11/12 energy efficiency program results are displayed in Figure 5.

Since the first annual efficiency goals were established in 2007, PWP has increased the funding and ramped up its programs. PWP exceeded the cumulative goals again for the fourth straight year in a row. Six-year energy efficiency program summary results (FY06/07 to FY11/12) are:

- 79,252 MWh cumulative annual savings (106% of adopted AB2021 goal).
- 16.7 MW peak load reduction (137% of adopted AB2021 goal).

Table 1: FY11/12 Customer Program Participation and Savings Results

Program Name	Units Installed	Customer Type	Customers	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	PAC	TRC	Utility Incentives ($)	Customer Incentives ($)
TOTAL EE PORTFOLIO	9,371		26,908	2,535	13,336,746	4.6	1.2	$2,772,657	$2,310,963
Energy Star	1,090	Residential	619	26	133,741	0.4	0.7	$ 304,529	$ 304,529
Efficient Cooling	509	Residential	221	59	61,727	1.8	0.6	$ 65,395	$ 65,395
Pool Pumps	31	Residential	31	2	9,951	1.1	0.9	$ 6,850	$ 6,850
Cool Trees	88	Residential	32	22	17,732	1.8	1.7	$ 3,282	$ 3,282
Energy Partnering Program	68	Commercial	34	2,067	9,287,984	6.2	1.2	$1,784,233	$1,784,233
WeDIP	85	Commercial	130	64	217,999	1.8	1.8	$ 110,944	
Residential Audits	286	Residential	286	49	44,450	0.4	0.4	$ 25,750	
Efficient Product Distribution	6,804	Residential	NA	42	285,768	2.6	1.4	$ 39,629	$ 39,629
Refrigerator Recycling	167	Residential	167	46	211,360	4.1	4.5	$ 17,325	$ 17,325
Refrigerator Exchange	387	Residential	387	108	491,877	4.1	4.5	$ 40,035	$ 40,035
Home Energy Reports	150,000	Residential	25,000		2,291,523	1.4	1.4	$ 325,000	
Water EE	1	Various	NA		266,873	12.8	8.9	$ 40,031	$ 40,031
EE Affordable Housing	1	Commercial	1	50	15,760	3.1	3.1	$ 9,653	$ 9,653

Program Cost Effectiveness

Table 1 displays the average cost-effectiveness of PWP's portfolio of efficiency programs. The benefits exceed the cost on both the Total Resource ("TRC") and Program Administrator ("PAC") cost tests, with scores of 1.2 TRC and 4.6 PAC.

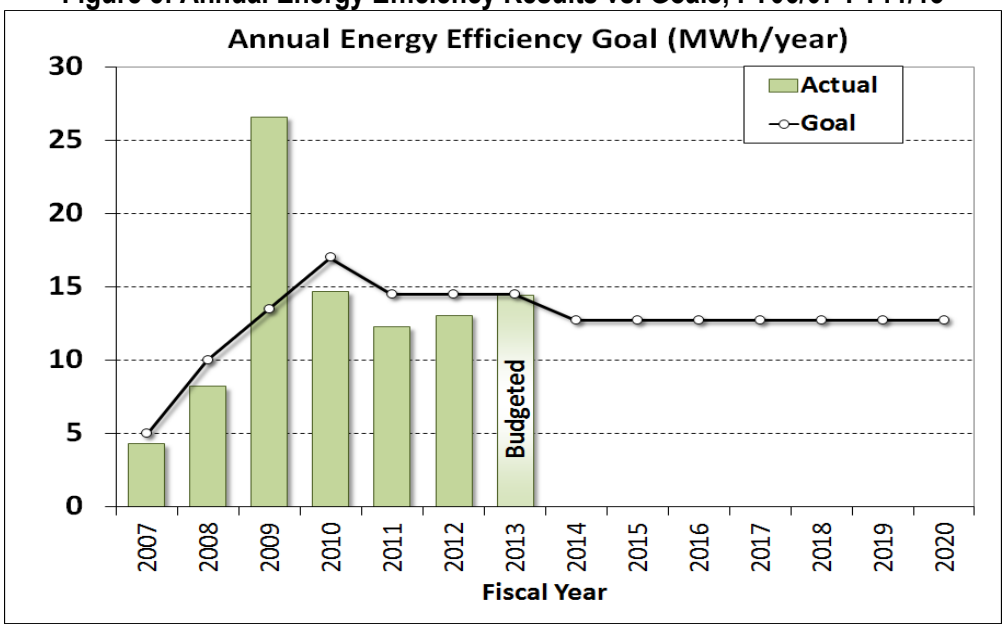
Budgeted (FY12/13) Energy Efficiency Program Objectives:

- Ensure that energy efficiency is a reliable resource for integrated resource planning by encouraging the installation of the most cost-effective, reliable, and feasible energy efficiency measures for Pasadena customers.
- Continue existing product menus in Q1 and Q2; re-evaluate all incentives and revise as needed in Q3 and Q4.
- PWP continues to plan and budget efficiency programs to meet the goals provided by the "EERAM" public utility tool for the current ten-year (2011-2020) period.
- Measure and evaluate the impact of energy efficiency measures and programs.
- FY12/13 efficiency program budget in excess of $3,600,000 are targeted to provide annual energy savings of almost 14,500 MWh and reduce peak demand by 2.73 MW

Budgeted (FY12/13) commercial customer programs that deliver significant results include one rebate program and one direct install program:

- Energy Efficiency Partnering Program ("EEP")
    - EEP delivers the highest results and has the greatest impact on PWP's system
- Water & Energy Direct Installation Program ("WeDIP")
    - Currently offered to small businesses (less than 30kW load)

Figure 5: Annual Energy Efficiency Results vs. Goals, FY06/07-FY11/13



Budgeted (FY12/13) residential efficiency programs include:

- Energy Star® Home Incentives Program
- Efficient Cooling Home Incentive Program
- Pool Pump Program
- Refrigerator Retirement Program
- Cool Trees Rebates

- Home Energy Reports: A pilot program with OPOWER to deliver customized printed energy use reports and provide online access to 25,000 randomly selected residential electric customers. These reports compare the electric usage of each recipient with similar PWP households. Savings will be measured annually against metered billing data and participation in PWP's rebate programs. Launched in June 2011, FY11/12 is the first program year that savings from the Home Energy Reports are be reported.
- Income-qualified Residential Efficiency Programs
    - Refrigerator Exchange
    - Efficient Affordable Housing Program
    - Lamp and fan distribution

Evaluation, Measurement, and Verification (EM&V)

In FY11/12, PWP continued to conduct EM&V activities on its energy efficiency programs to justify program design and expenditures, as well as verify program results to PWP's electric distribution system. Such EM&V actions were taken on the following programs:

- Residential Programs
    - Energy Star: Contractor performed site verification on 10% of all residential efficiency equipment purchases and installations; he also left behind 3 CFL's with each customer verified.
    - Prescriptive rebates: Use "natural replacement" deemed savings per the E3 tool for prescriptive rebates, except where customers indicate "early replacement" eligibility (based on equipment age) on rebate applications.
    - Refrigerator recycling and replacement program: Equipment verifications were provided by ARCA, the vendor who delivers and recycles these units.
    - KEMA/E3 Energy Efficiency Reporting Tool ("E3"): Used to calculate deemed energy savings on residential program activity.
- Non-Residential Programs
    - Utility staff and/or third party engineering contractors performed pre-and post-installation equipment and installation verification on site for 100% of customer projects.
    - Energy Efficiency Partnering (EEP):
        - Of the 68 customer projects that were completed, 19 had an independent engineering analysis conducted, i.e. 28% of all EEP projects were independently studied.
        - Mechanical Equipment Retrofits: PWP's independent engineering contractor calculated energy savings and demand reduction using the Department of Energy's eQuest building modeling software for all mechanical projects including central plants, chillers, package units, and motors.
        - Lighting: PWP used an engineer-certified lighting calculator (Excel workbook) to calculate lighting retrofit project energy savings based on the actual hours of operation. Lighting accounted for 75% of the FY11/12 EEP projects.
        - Data loggers and CT's were used to verify operating hours and equipment savings on 10 % of EEP mechanical projects and 23% of EEP lighting projects.
    - Small Business Direct Install (SBDI)
        - Staff evaluated first pilot phase (WeDIP-1) program results.

        - Launching a new full-scale Water and Energy Direct Install (WeDIP) program in spring 2013.
        - Will be independently evaluated after first full program year.
    - PWP staff and consultants reviewed the EEP program's impact, strategy, design, process, energy baselines, data management, reporting and marketing. Changes to the EEP program are being implemented in FY12/13.

Additional Questions Asked by the California Energy Commission:

- What energy efficiency program had the greatest impact? Why?
    - PWP's Energy Efficiency Partnering program for medium and large commercial electric customers remained the single largest contributor to meeting PWP's annual efficiency goals. Annual savings of 9,288 MWh and load reduction of 2.1 MW from FY2012 commercial customer efficiency retrofits.
    - The Home Energy Reports, provided to approximately 25,000 residential electric customers, was the second largest contributor with annual savings of 2,292 MWh.
- What changes occurred that may have affected energy savings results or funding amounts?
    - Please explain changes that affected savings amount (i.e. what caused increases or decreases in efficiency savings in the past year).
        - Number of program participants are increasing as the economy improves.
        - For reporting purposes, PWP is reporting actual power distribution system impacts from all customer program activities (i.e., NTG = 1.0 in E3).
    - Please explain increases or decreases in funding for the programs.
        - PWP revenues steadily decreased from 2008 to 2012.
        - Projecting a slightly higher level of revenue in FY12/13 than was collected in FY11/12; electric sales are increasing by an average 4%.

Budgeted (FY12/13) Program EM&V

PWP will continue its rigorous efforts to verify customer installations and validate customer projects and overall program results.

- Program Evaluation Plan: PWP continues to evaluate and engage qualified vendors to provide EM&V services. Planned impact and/or process evaluations over the next two years:
    - 2012 Energy Efficiency Partnering (EEP): completed
    - 2013 Water & Energy Direct Install Program (WeDIP): pending
    - 2013 Home Energy Reports Program: pending

Recently Completed Reports:

During 2010 and 2011 (FY11/12), Alternative Energy Services Consulting ("AESC") provided engineering and project management support to PWP for its EEP Program, which included the following work:

- Measurement and verification study on the chiller plant optimization project at the Pasadena Convention Center.
- Verified savings and equipment installation for a city-wide traffic signal LED retrofit project.
- Calculated savings estimates for various retrofit and Retro-commissioning (RCx) projects at the California Institute of Technology (Caltech).
- Evaluated impact of California Green Codes on EEP Program claimed savings.

- Simulated potential energy and water savings for typical Residential efficiency project. Evaluated impact of Title 24 claimed savings.
- Energy Baseline Evaluation for Commercial Retrofit Projects:
    - Reviewed California Energy Commission (CEC) requirements, current Investor Owned Utility (IOU) and Publicly Owned Utility (POU) incentive programs, and applicable Pasadena City codes.
    - Provided recommendations to define baselines for EEP program applications.

Pasadena – Summary of Energy Efficiency Programs, FY2012

Pasadena		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	4	1	1	248	2,976	2	$340	$123	$463
HVAC	Res Cooling	1,306	65	64	82,775	709,788	451	$69,698	$11,830	$81,528
Appliances	Res Dishwashers	3			92	1,013	1	$210	$39	$249
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	6,084	315	48	273,348	1,689,220	960	$28,820	$13,645	$42,465
Pool Pump	Res Pool Pump	31	2	2	9,951	99,510	56	$6,850	$1,604	$8,454
Refrigeration	Res Refrigeration	1,572	176	176	826,415	5,237,761	2,956	$356,085	$78,908	$434,993
HVAC	Res Shell	76	14	14	19,328	346,102	226	$15,043	$5,574	$20,617
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	287	49	49	2,335,973	7,007,918	4,172	$350,750	$82,146	$432,896
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	2	154	154	772,430	15,448,600	9,882	$181,315	$61,578	$242,894
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	3	1,771	1,771	8,034,172	108,787,232	64,432	$1,591,305	$352,475	$1,943,780
Process	Non-Res Motors	1		204	691,049	11,056,784	6,162	$118,317	$28,741	$147,058
Process	Non-Res Pumps	1			266,873	4,269,968	2,619	$40,031		$40,031
Refrigeration	Non-Res Refrigeration	1	1	1	8,332	116,648	65	$4,240	$1,056	$5,296
HVAC	Non-Res Shell	1	50	50	15,760	315,200	191	$9,653	$1,931	$11,584
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		9,372	2,598	2,535	13,336,746	155,088,720	92,175	$2,772,657	$639,651	$3,412,308
T&D	T&D									
Total		9,372	2,598	2,535	13,336,746	155,088,720	92,175	$2,772,657	$639,651	$3,412,308

EE Program Portfolio	TRC Test	**1.22**
	PAC Test	**4.65**

PITTSBURG POWER COMPANY dba ISLAND ENERGY

Pittsburg Overview

- Doing business as Island Energy, the Pittsburg Power Company owns, operates an electrical and natural gas distribution system located on Mare Island, Vallejo since 1996.
- Island Energy supplies electric and natural gas services to about 180 commercial and 278 residential accounts.
- Island Energy's annual electric load is 92% commercial and 8% residential.
- Peak demand is approximate 4 megawatts which usually occurs during noon to 4pm.
- Island Energy purchases 100% of its electricity through long-term contracts. About 35% to 60% of electricity that Island Energy purchases are hydroelectricity depending on weather conditions.
- The Public Benefits Fund is collected through a kilo-watt hour usage-based charge and supports the Energy Efficiency Programs, Low Income Assistance Program, and Solar Incentive Program on Mare Island.

Commercial Energy Efficiency Program Highlights

Island Energy has committed $3,000,000 of its reserve to upgrade its electrical substations and backbone distribution system to improve system efficiency and reliability. The three-phased project involves replacements of aged transformers with new and more efficient transformers, installation of two new SF6 circuit to replace oil circuit breakers to reduce GHG emission and stabilization of a series of substations to improve system reliability.

Commercial Energy Efficiency Programs

Established in 2009, Island Energy's Commercial Energy Efficiency Programs are designed to encourage energy efficiency measures to commercial customers. Based on a study of existing business types and load profile on Mare Island, the following programs were developed to improve energy efficiency and to maximize energy savings for existing businesses on Mare Island.

- **Commercial Lighting Rebate:** Island Energy offers up to $10,000 rebate for installation of energy efficient lighting fixtures, sensors & controls, LED lights or customized lighting retrofit projects. In Year 2012, a project converted an old warehouse into a manufacture facility with installation of 200 units of 6 lamp T5 High Efficiency Fluorescent lamps, saving 120,000 kilowatt-hours per year. Another commercial lighting retrofit project replaced 51 old fixtures with T5 lamps, saving 16,000 kWh a year.
- **Motors & Process Improvement:** Island Energy offers up to $15,000 rebates for installation of new, NEMA premium efficiency motors ranging in size of 5 to 200 hp. Commercial customers can either replace their old motors with a new motor or add a new motor to their facilities. The rebate for this program is $0.05/kWh of the first year's expected energy savings.
- **Compressed Air System:** Island Energy offers rebates up to $35,000 for installation of new compress air system or redesigning or retrofitting an existing compressed air system. The rebate for this program is $0.05/kWh of the first year's expected energy savings. Island Energy has paid $35,000 rebates since the inception of this program.

Residential Energy Efficiency Programs:

- **Home Energy Audit Service:** On-site free Energy Advisory service is available upon resident's request. Trained electrical and gas technicians can provide on-site analysis and offer specific strategies to help residents to reduce their energy bills.
- **Residential Retail Lighting:** Island Energy provides up to three free CFL light bulbs per year per household on Mare Island. Coupons for two extra light bulbs will be given to residential customers if they register themselves with Island Energy's website to learn more about Island Energy's energy efficiency programs. The CFL light bulb uses 15 watts to provide the light of a 60 watt incandescent light bulb. Island Energy has given out over 1,500 CFL light bulbs over the years.
- **Appliance Efficiency Program:** Island Energy offers rebates for installation of Energy Star-rated appliances, including dishwashers, clothes washers, refrigerators and air conditioners. Island Energy has paid $2,225 rebates for over 36 Energy-Star qualified appliances since the inception of the program in 2008.

Ten-Year Electric Energy Efficiency Goals Update

Island Energy developed its first ten-year Energy Efficiency Plan in 2007, which established an annual energy savings goal of 0.85% of the total load. The energy saving target then was modified to a range between 0.22% and 0.35% of the total load in year 2010. Island Energy has achieved the energy savings goal by sectors through all energy efficiency programs implemented. Since there have been more economic activities on Mare Island since year 2010; the total electric load is not reduced compared to the total load of year 2010.

Pittsburg – Summary of Energy Efficiency Programs, FY2012

Pittsburg		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	4	1	1	211	2,530	1	$300	$560	$860
HVAC	Res Cooling									
Appliances	Res Dishwashers	1			25	273		$50	$131	$181
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	4			69	345		$12	$34	$45
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	3			272	3,812	2	$150	$458	$608
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	251	12	12	45,321	607,015	336	$14,725	$6,999	$21,724
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		263	13	13	45,898	613,974	340	$15,237	$8,182	$23,419
T&D	T&D									
Total		263	13	13	45,898	613,974	340	$15,237	$8,182	$23,419
EE Program Portfolio TRC Test		1.26								

PLUMAS-SIERRA RURAL ELECTRIC COOP

Plumas-Sierra Overview

Our mission: To provide electric service with a high level of reliability for a fair and reasonable cost. PSREC is dedicated to improving the quality of life of our member-owners and our rural communities.

- Plumas-Sierra REC was established in 1937 and recently celebrated 75 years of providing services to its rural member-owners
- Average member-owners served: 7758
- Revenue by rate class: 45% residential, 50% commercial/industrial, 5% irrigation
- Annual energy use: 151 GWh: 53% commercial, 40% residential, 7% irrigation
- Peak demand in 2012: 28.6 MW winter peak
- PSREC facilities include: two 69kV interconnect substations, 150 miles of transmission line, 11 distribution subs, 1200 miles of 12.47/7.2kV distribution line, and a 6MW cogeneration facility
- 59 employees, including our telecommunications subsidiary.

Plumas –Sierra Energy Efficiency Program Background

PSREC implemented energy efficiency programs beginning in the early 1980s. Our programs are designed to encourage members to consciously focus on energy efficiency and conservation with a goal to decrease energy demand and costs while conserving resources. This is achieved by increased awareness through promotion and marketing of programs and by offering a wide range of educational resources. PSREC primarily uses KEMA's data for energy efficiency measure quantification.

Current Energy Efficiency Programs and Services (Calendar year 2012)

PSREC administers a comprehensive energy efficiency incentive program portfolio to inspire rural members to upgrade their homes and equipment to be more energy efficient. Generous rebates and solid technical support are available to members who purchase and install high-efficiency air- and water-heating systems, appliances and lighting.

Residential Programs

- Ground Source Heat Pump (GSHP) Program: 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 Rebates: Rebates available for the purchase of an ENERGY STAR® refrigerator, dishwasher, clothes washer or other small electronics.
- Non-essential Freezer/Fridge Retirement: Rebates offered for recycling a non-essential freezer or refrigerator.
- 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.
- Energy-Efficient Equipment Discounts: Discounted sales of water heater blankets, low-flow showerheads and ConvectAir heaters.
- Compact Fluorescent Light Bulb Program: Discounted sales of CFLs and distribution of free CFLs at several public events. Additionally, rebates offered for the purchase of ENERGY STAR® CFLs

from local retail locations. This program participation has significantly decreased, possibly due to market saturation or interest in newer technology.

- LED Pilot Program: Offered free LED lamps to a small group of members; survey results reflect positive interest in LED technology.
- ENERGY STAR® LED Holiday Light Rebate: Rebates provide an incentive to replace incandescent holiday light strands with qualified new ENERGY STAR LED holiday light strands.
- Energy Audits: PSREC significantly increased efforts to provide free comprehensive energy audits to assist members with energy conservation or 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.
- 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.
- Green Building Program: Presentations to introduce contractors to new technologies for building more energy efficient homes. We have had successful response to these presentations and have found that many contractors are beginning to realize the importance of energy efficient and green retrofits for existing homes, especially with the housing slump.
- 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.
- Lending Library and Resource Center: Provide 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.

Commercial Programs

- Custom Commercial Lighting Retrofit Rebates: Custom rebates offered to commercial businesses that retrofit existing lighting with more efficient lighting. Several members have inquired about the program, yet, not many have participated.
- Irrigation Efficiency Program: To encourage the installation of energy efficient equipment in agricultural irrigation systems PSREC offers low-cost pump tests and rebates for NEMA Premium motor replacement or installation of variable frequency drives.
- Commercial Energy Audits: Provide free energy audits to businesses to assist members with energy conservation or 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.

2012 Program Summary

Total Program Costs: $118,049
Total kW demand reduction: 56 kW

Total Lifecycle kWh reduction: 631,962
Program Portfolio TRC Test: 0.49

Analysis in Variation of Goals and Results (Calendar year 2012)
Historically, a large part of PSREC's energy savings have typically been achieved through our highly successful Ground Source Heat Pump (GSHP) Program. Most GSHP installations are in newly constructed homes, due to PSREC's robust outreach and education to encourage custom home contractors to incorporate GSHPs in their construction plans.

With the near halt of new construction and economic downturn, our forecasted energy efficiency goals have been drastically impacted. Issuance of building permits in our Plumas County service territory declined more than 90% since 2006, and GSHP installation has declined by more than 80% in the same time frame. The construction decline has been devastating to our community, as well as to our energy efficiency objectives. Our electric service write offs have increased more than 40% from 2006. We are hopeful to see the market recover in future years and would anticipate our dedicated contractor network to again assist us in encouraging the installation of GSHPs.

In the meantime, PSREC continues to introduce contractors to new technologies for building more energy efficient homes. Additionally, since the principal residential program was impacted by the construction slump, PSREC has attempted to diversify programs to include small commercial and irrigation members. However, the results are far from exceptional.

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 will be to reduce demand in the winter.

Proposed PSREC Energy-Efficiency Programs and Services (for 2013)

- Maintain or expand existing programs.
- Evaluate and implement new energy-efficiency programs and technologies, as applicable to include reduction of winter peak demand.
- Continue to target small businesses to provide incentives for lighting and refrigeration retrofits.
- Revise and expand the Irrigation Efficiency Program for our agricultural members.
- Strive to establish more green building in the area and encourage economic growth.
- Introduce Energy Orbit, PSREC's new online rebate application processing database.
- In 2013, PSREC is implementing an online branded store where members can purchase energy efficiency products at discounted rates through Service Concepts.

Utility Energy Efficiency Program Targets
PSREC's Board of Directors has approved a ten year target to conserve 1,565 MWh. This goal is aligned with PSREC's energy saving achievements.

Planned EM&V Efforts

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.

Plumas-Sierra – Summary of Energy Efficiency Program, FY2012

Plumas-Sierra		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	13	3	3	1,015	12,179	7	$455	$1,684	$2,139
HVAC	Res Cooling	12	2	1	9,954	248,850	151	$12,132	$18,627	$30,759
Appliances	Res Dishwashers	14	1	1	344	3,782	2	$490	$523	$1,013
Consumer Electronics	Res Electronics	7			660	2,642	1	$140	$285	$425
HVAC	Res Heating									
Lighting	Res Lighting	314	46	1	13,320	67,204	36	$2,344	$9,082	$11,426
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	68	4	4	18,189	114,828	62	$4,050	$14,238	$18,288
HVAC	Res Shell	218		1	19,795	66,190	38	$1,575	$24,285	$25,860
Water Heating	Res Water Heating	28	1	1	5,759	75,432	40	$5,746	$16,975	$22,721
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling									
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	50			2,240	35,840	19	$1,500	$478	$1,978
Process	Non-Res Motors									
Process	Non-Res Pumps	6			1,672	5,015	3	$1,050	$2,390	$3,440
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		730	56	12	72,948	631,962	359	$29,482	$88,568	$118,049
T&D	T&D									
Total		730	56	12	72,948	631,962	359	$29,482	$88,568	$118,049

EE Program Portfolio TRC Test	**0.49**

PORT OF OAKLAND

Port of Oakland Overview

- 161 customers, all commercial
- Peak demand: 11.6 megawatts
- Annual energy use: 68 gigawatt-hours

Port of Oakland Energy Efficiency Program Highlights

Port of Oakland had one customer take advantage of energy efficiency incentives. Landmark Aviation Oakland replaced 72 existing metal halide fixtures with more efficiency high bay fluorescents. The demand and the energy savings for 2012 are 39.8 KW and 214,920 KWH respectively. The total rebate payment was $ 10,746.00.

Current Commercial Programs

- **Energy Audits**: The Port with the collaboration of City Of Oakland is currently conducting an Energy Audit program that will result in recommendations of major energy saving retrofit/improvement projects that could be undertaken to effectively support load reduction and the more efficient use of energy in the area. Rebates will be provided for the energy efficiency projects completed based on the energy audit recommendations. The energy audit is provided to the Port's customers free of charge.
- **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 percentage 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 efficient equipment/improvements by our commercial customers. Under our program, the eligible projects must reduce energy usage by a minimum of 20 percent, to be eligible for a rebate of the equipment cost differential (up to a 90 percent rebate for energy saving of 90 percent or more).
- **Lighting Retrofit**: A program providing rebates for the installation of energy efficient lighting that reduces annual energy usage by at least 35 percent in commercial facilities. This rebate is based on a single flat incentive rate of $0.05 per annual kilowatt-hours saved.
- **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. To qualify for a rebate under this program all Energy Savings/Efficiency Research, Development and Demonstration Programs must be based on environmental friendly natural resources (or waste products).

Proposed Port of Oakland Programs and Services: **(for 2011-12)**

Maintain existing programs at current levels.

Port of Oakland Renewable (or Green) Energy Programs:

- **Distributed Solar Energy:** Beginning January 1, 2008, this rebate will reimburse new solar energy generating facilities a one-time flat rate of $ 3.50 per watt (Alternating Current) of installed capacity. In the event the new solar facility generates more than the electric customer's monthly electric consumption, then the Port will purchase the excess solar electric power from said facility at the same rate the Port sells power to said facility. In addition, the new solar energy generating facilities must obtain Port approval and must comply with all regulatory requirements prior to the construction of the facility. This rebate is subjected to 7% annual reduction per SB1.
- **Distributed Wind Energy**: 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 (alternating current) 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 (alternating current) of installed capacity. In the event the new wind power facility generates more than the electric customer's monthly electric consumption, then the Port will purchase the excess electric power from said facility at the same rate the Port sells electric power to said facility. 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 qualify 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 – Summary of Energy Efficiency Programs, FY2012

Port of Oakland		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
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	72	34	34	182,682	1,826,820	1,012	$10,746		$10,746
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		72	34	34	182,682	1,826,820	1,012	$10,746		$10,746
T&D	T&D									
Total		72	34	34	182,682	1,826,820	1,012	$10,746		$10,746
EE Program Portfolio TRC Test		**10.40**								

RANCHO CUCAMONGA MUNCIPAL UTILITY

Rancho Cucamonga Overview

The Rancho Cucamonga Municipal Utility (RCMU) was formed in 2001 to provide safe, reliable and cost-effective electric service to retail customers that were building new facilities located within the designated service territory. Annually, more than 66,000 megawatt-hours of electricity are distributed to our customers via 20 circuit miles of wire spread across approximately 4 square miles. The historical peak demand, set in August 2011, is 17.5 megawatts. RCMU currently serves no residential customers but has over 485 commercial accounts, many of which are smaller, privately owned businesses. RCMU also services the City of Rancho Cucamonga's City Hall, Cultural Center, Victoria Gardens Library, Animal Center, and the city's Epicenter Entertainment and Sports Complex.

RCMU Programs

In fiscal year 2011/2012, RCMU issued $6,194 in lighting and refrigeration rebates, which will save an estimated 134,986 kWh per year. The majority of the savings was from a lighting upgrade at the City's Epicenter/Sports Complex which includes a Class A Minor League baseball stadium, two regulation soccer fields, three adult softball fields and a regulation Little League field which are all equipped with regulation outdoor lighting. The project involved delamping thirty 1500 watt lights and replacing 240 lights with more efficient lighting. The estimated savings will be approximately 111,400 kWh per year. The other rebates included a lighting replacement with LED's and a national grocery chain installed RemiSafe glass doors to enclose all of their open refrigerated cases.

Although the rebates were lower this year, staff did see an increase in customer inquiries on the various programs being offered. Numerous preliminary applications were submitted with installations being completed in late 2012. There is still reluctance among many small commercial customers to participate in programs with any upfront monetary costs; therefore, staff is continuing to explore incentives that will accommodate this trend including implementing a direct installation programs. RCMU is continuing to advertise the rebate program and energy efficiency information with a quarterly newsletter and bill inserts. Free energy audits are currently utilized to educate customers on current rebates and energy efficiency updates.

Commercial Programs

- **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.
- **Time of Use Rates**: All customers whose demand exceeds 200 kilowatts receive time-of-use pricing, incentivizing them to reduce their energy costs through the effective time management of their energy usage.
- **HVAC Tune Up Program**: RCMU implemented an HVAC tune up program to encourage customers save energy and increase the systems longevity. The program will offer customers a rebate of $30 per unit annually. Staff plans to market the program in the spring to increase customer participation.
- **Incentives/Rebates**: RCMU has adopted the "Express Solutions" model for energy efficiency rebates. RCMU does not restrict customers to specific technologies or approved models of

equipment; customers can elect to install any energy efficient improvement they wish. Customers receive a rebate for estimated kilowatt hour savings for the first year. RCMU uses the following categories and incentive rates:

Category	Annual Consumption Reduction Rebate
Lighting	$.05/kwh
Refrigeration	$.09/kwh
HVAC	$.09-$.15/kwh
Motors	$.09/kwh
Other	$.09/kwh

Renewable Energy Programs

Currently, RCMU has two solar photovoltaic customers which are estimated to save a total of 105,049 kWh per year. Two new systems are also being installed in late 2012/early 2013. RCMU will continue to offer an incentive of $2.25 per watt installed for renewable energy generation systems with a peak AC output of less than 30 kW, and $0.08 per kilowatt hour produced for renewable energy generation systems with a peak AC output of 30 kW or more. By keeping the rebate incentive at this rate, RCMU hopes to encourage more businesses to invest in renewable energy. These incentives are capped at 50% of total system installation cost. RCMU is also currently waiving all RCMU-related plan check and inspection fees.

Demand Reduction Programs

In 2012, RCMU partnered with the Southern California Public Power Authority (SCPPA) and Ice Energy to install the thermal energy storage product called Ice Bear. Installation of two Ice Bear's was completed in late 2012. The system stores and produces ice during the off peak hours of the night and then works to cool the building through its existing HVAC system during the peak hours of the day. RCMU hopes to reduce electric system demand during the critical hours of the day to help ensure overall system reliability.

Efficiency Targets

RCMU is revising the next ten year efficiency goals by utilizing the "EERAM" tool provided to California's public utilities by Navigant Consulting. The proposed ten-year energy efficiency and demand reduction goals represent a 1.0% reduction of RCMU's forecast peak demand. Staff is recommending the energy savings and demand reduction targets provided by the model be adopted by City Council in Spring 2013. RCMU has met previously set goals and feels the increased goal will be obtainable due to recently developed programs and increased awareness among customers.

Rancho Cucamonga – Summary of Energy Efficiency Programs, FY2012

Rancho Cucamonga		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
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	396	205	25	132,186	2,317,476	1,248	$3,702	$31,291	$34,993
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	14	6	3	2,800	44,800	25	$2,492	$709	$3,201
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		410	210	28	134,986	2,362,276	1,273	$6,194	$32,000	$38,194
T&D	T&D									
Total		410	210	28	134,986	2,362,276	1,273	$6,194	$32,000	$38,194

EE Program Portfolio TRC Test	**4.24**

Overview Energy Efficiency Program Performance Overview

Redding Electric Utility (REU) spent $2.0 million on its Public Benefits Program (PBP) in Fiscal Year (FY) 2012. Of this amount, 50 percent or $1 million was spent on REU's energy efficiency improvement programs. In addition to this amount, REU invested $500,000 through supplemental AB2021 investments in EE/DSM qualified projects/programs. These investments are part of REU's ongoing energy efficiency improvement program implementing thermal energy storage in commercial air-conditioning applications.

In summary, during FY 2012 REU achieved a net annual energy savings of 345 Megawatt-hours and reduced our system's net coincident peak demand by 0.5 megawatt (MW) at a cost to the Utility of approximately $1 million. Based on the state-sanctioned E3 computer model used to evaluate energy efficiency program cost effectiveness, this translates into a 1.38 overall energy efficiency program Total Resource Cost (TRC) ratio for REU.

REU's FY 2012 PBP programs continued to result in less energy savings year-over-year largely due to the North State's struggling economic recovery. Redding and Shasta County continued to see very high unemployment. In addition, and as stated in previous years reporting, it is becoming increasingly difficult for utilities to find energy efficiency measures that yield strong energy savings and are deemed to be "cost-effective" in the E3 model.

Background

Since 1998, REU has spent more than $17 million in numerous rebate and incentive programs to increase the energy efficiency in the Redding community. These programs have raised customer awareness through increased education on energy efficiency and with the installation of high efficiency measures. REU continued to offer rebates for energy efficient products and measures that meet utility-defined criteria and specifications including: air-conditioning equipment, household appliances, lighting, and pumps/motors in FY 2012. Because of the relatively high saturation level of Energy Star appliances and air conditioners with SEER rating of 14+, REU's customers are not participating in our rebate programs at the rate they had in previous years.

An example of the changing "market" for energy savings is high efficiency air-conditioning (AC) equipment, which has been, up until 2011, the most successful incentive program for REU. This is largely due to the relative impact on REU's peak load demand reduction which is a primary focus for our utility – while these AC units also provided a positive Total Resource Cost (TRC) cost test result. Based on this and other reasons outlined below, REU continued to shift its existing programs away from those that have been historically beneficial and moved towards more peak load shifting and demand reducing measures that may not be as "economically beneficial" to individual customers but will provide significant value to REU and our electric system's operating efficiency overall, which in turn benefits all REU customers.

Rebates for many of REU's other programs, such as the ENERGY STAR®-approved Appliance rebate and the lighting retrofit programs, have been highly utilized by customers to reduce utility bills and save energy; however, their system impact has been less dramatic and far less valuable for the Utility. Specifically, the "non-HVAC" programs serve to reduce overall energy usage more than peak demand. By definition, any

program that reduces energy use by a greater percentage than it reduces peak demand serves to reduce the system load factor. Such a reduction in utility system load factor is, ironically, a reduction in utility system efficiency – and seems contrary to the intent of a program designed to increase efficiency. Reducing individual consumers' energy usage, without regard for the impact on overall electric system efficiency is not considered to be in-line with REU's utility system planning. Today, REU has one of the lowest system efficiency ratings (Load Factors) in the State at approximately 38 percent.

Therefore, while many energy efficiency programs are largely successful in reducing utility customer energy use, unless there are sufficient incentives and programs available to reduce peak demand by a like amount or more, these efficiency programs will serve to reduce utility systems' operating efficiency which increases utilities' operating costs and customer pricing/rates.

Serving the peak demand is essentially the most costly load – both economically and environmentally – for summer-peaking electric utilities to serve (such as REU). Therefore, reducing this peak should be the most critical aspect of electric utility operations. Unfortunately, there continues to be a perception in some quarters that any and all kilowatt-hours saved are of equal value; that is simply not the case for REU.

A utility operator can tell you "not all kWh is the same". For example, reducing the energy consumption of Redding's streetlight service by 5,000 kWh (0.5 MW) from 8 p.m. to 6 a.m. is far less valuable to our Utility's customers than shaving 5,000 kWh and 1.0 MW from 1 p.m. to 6 p.m. The fact that on-peak energy has a greater amount of embedded source energy has been recognized over the last decade by state legislators and regulators -- as most clearly demonstrated by the California Energy Commission's adoption and application of the Time Dependent Valuation (TDV) of energy usage to the state's Title-24 Commercial building code.

REU would submit that similar treatment should be afforded to the consideration or valuation of energy efficiency programs in future EE modeling treatments such that not every kWh saved is of equal value. The legislatively-mandated loading order for cost-effective resource procurement addresses this with peak load reduction being placed at the top of the list.

While REU's energy efficiency programs have been very successful in reducing energy consumption for customers for more than 10 years, our programs have not been as successful in reducing peak demand. Since 1998, REU's annual load factor has decreased from 44 percent to as low as 38 percent. This has occurred as our current efficiency programs have served to shave more energy from the shoulder and off-peak hours than they have from the on-peak period.

This causes "higher" peaks and "deeper" valleys in the Utility's load profile. Beyond the costly on-peak service requirements, the deep valleys can also create minimum load conditions for system operators and make it difficult to accept wind energy, which is often produced in large quantities during off-peak periods.

Going Forward

To continue working toward improving REU's operating efficiency and to continue to provide cost-effective efficiency improvements in our system, the Utility's thermal energy storage (TES) program was expanded in FY 2012. 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.

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 new refrigerant R-410A in DX/AC units, the new AC units being installed in California will be at least 15 to 20 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.

While REU's high-efficiency air-conditioner incentive program has been one of, if not our most successful programs in the past, we will be less likely to see significant long-term peak load reduction benefits because of the reduced efficacy and performance of the new refrigerant at high ambient temperatures. Therefore, REU is turning to the TES load-shifting technology that will allow the Utility to cost-effectively sell energy to provide air-conditioning comfort to our customers, and reduce operating costs for both the individual customer and to our community as a whole (all REU customers).

In a related energy efficiency program development, the City of Redding received an allocation of $892,700 from the Department of Energy's Energy Efficiency Community Block Grant Program at the beginning of 2010. REU developed and implemented a whole-house based, deep energy retrofit/weatherization program for income-qualified customers throughout FY2010 and FY2011. Part of this Program was the creation of a training program for local contractors in association with the Shasta Builders' Exchange to create a green workforce that is capable of providing high-quality home performance contracting services in our community. With the training phase completed for more than 40 contractors, REU implemented the retrofit program and deployed these contractors to specific, income-qualified homes for auditing and remediation services that improve the energy efficiency, safety, and indoor air quality for the occupants.

REU and our participating contractors completed 24 whole-house, deep energy retrofits under the EECBG program, with an average energy (combined gas and electric) reduction of more than 30 percent in the homes on an annual basis. With this energy savings, REU also reduced each home's peak demand by 50 percent or more. We achieved this by using the proper air-sealing and insulation installation techniques in these homes, which allowed our contractors to install new air conditioning units in every home that was at least one-half the tonnage of the AC unit that was in-place before the retrofit project. In addition, REU also reached out to approximately 150 additional income-qualified homes that were not suitable for the whole house retrofit program to provide low-cost, energy efficiency improvements to benefit the occupants. REU has completed our spending under the EECBG program.

Because of the success of the EECBG-funded training program and the associated retrofit projects, REU evolved its EECBG funded program into a utility-based Home Performance Rebate Program for our customers, funded through REU's FY 2012 Public Benefits Program. In FY 2012, REU's Home Performance Rebate Program completed 10 full projects, resulting in annual energy savings per project of approximately 30-35 percent (average per home), and each project reduced peak demand by approximately 55 percent. REU will report on its Home Performance Program results (PAC, TRC, PCT and RIM) with our FY 2013 Energy Efficiency filing. It is worth noting that REU's Home Performance Program was featured in the January 2012 edition of ASHRAE's (the magazine of the American Society of Heating, Refrigeration, and Air-Conditioning Engineers) monthly journal, and continues to receive recognition and interest from utilities and trades up and down the State and from across the Nation.

Redding – Summary of Energy Efficiency Programs, FY 2012

Redding		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	104	14	14	5,481	65,770	36	$3,300	$730	$4,030
HVAC	Res Cooling	867	146	138	112,148	2,018,664	1,230	$191,169	$39,049	$230,217
Appliances	Res Dishwashers	130	11	11	3,193	35,121	19	$4,025	$390	$4,415
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting									
Pool Pump	Res Pool Pump	67	4	4	14,840	148,398	80	$13,400	$1,512	$14,912
Refrigeration	Res Refrigeration	183	3	3	16,607	232,502	126	$16,605	$2,363	$18,968
HVAC	Res Shell	424	57	57	40,989	606,193	375	$112,287	$11,298	$123,585
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	283	36	205	44,791	881,170	1,702	$562,245	$71,320	$633,564
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	2,807	26	26	107,368	1,181,045	655	$11,930	$7,964	$19,894
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		4,864	297	457	345,415	5,168,863	4,225	$914,961	$134,625	$1,049,586
T&D	T&D									
Total		4,864	297	457	345,415	5,168,863	4,225	$914,961	$134,625	$1,049,586

EE Program Portfolio	TRC Test	**1.38**
	PAC Test	**1.63**

RIVERSIDE PUBLIC UTILITIES

Riverside Overview

- Riverside Public Utilities (RPU) was established in 1895
- Over 106,000 electric and 64,000 water customers
- Peak demand hit system high of 604 megawatts in August 2007
- Annual energy use is approximately 2,100 gigawatt-hours
- RPU employs just under 600 full-time employees
- Service territory is approximately 90 square miles

Mission: The City of Riverside Public Utilities Department is committed to the highest quality water and electric services at the lowest possible rates to benefit the community.

Our Ten-Year Vision: Our customers will recognize Riverside Public Utilities as a unique community asset with a global reputation for innovation, sustainability and an enhanced quality of life.

Core Values: safety, honesty and integrity, teamwork, professionalism, quality service, creativity and innovation, inclusiveness and mutual respect, community involvement, and environmental stewardship.

Achievements: In July 2010, the RPU General Manager launched the Environmental and Economic Effectiveness Effort (E4 Plan). This 2-year plan addressed difficult economic times through short-term electric rate freezes, economic development efforts, and a focus on green programs. The E4 Plan initiative also highlighted aggressive customer outreach, upgrades to RPU websites, Automated Meter Reading (AMR) implementation, paperless billing, renewable solar energy and energy efficiency programs. In 2012 the 2-year E4 Plan was completed with an impressive list of accomplishments including:

- A successful 2-year electric rate freeze.
- The installation of over 104 new photovoltaic systems within RPU's service territory resulting in an additional 3.3 megawatts of rooftop solar distributed generation.
- 1,280 new jobs created and 500 jobs retained.
- Over 19 million kWh in total energy savings
- Over 2,000 homes improved through energy efficiency measures

In 2012 RPU's innovative energy efficiency programs exceeded established goals, garnered national attention and assisted customers in saving on their utility bills while reducing energy consumption. In addition, RPU partnered with the Southern California Gas Company to install energy efficiency upgrades for low-income customers through the Energy Savings Assistance Program (ESAP) and reached over 1,000 small business customers providing up to $1,500 in free energy and water efficiency measures through the creation of a new Small Business Direct Installation (SBDI) program.

Additional Public Benefits Program Accomplishments include:

- RPU continues to use all PBC monies to support rebate programs, direct installation programs, low income programs, research and development and renewable energy projects that give back to the community.
- RPU's "Tree Power" program provided more than 117,000 shade trees to its customers since 2001.

- RPU assisted over 7100 customers through the SHARE low income assistance program.
- RPU received the 2011 Outstanding Energy Management Award from the American Water Works Association (AWWA) for the ongoing in-system study of a water pipe that generates electricity.
- Riverside was chosen to Showcase Green/Sustainability Accomplishments at the National League of Cities Event sharing information about programs which helped to strengthen the local economy and protect our natural resources and was awarded the California Sustainability Alliance's 2011 Sustainability Showcase Award for Local Government.
- RPU's "Power Partners" Voluntary Load Shed Program was created and implemented. Twenty-five (25) Key Account customers committed to 14 MW's of load shed capability.
- Riverside Public Utilities' (RPU) Environmental and Economic Effectiveness Effort (E4) Plan received an Award of Merit by the California Association for Local Economic Development (CALED) in their 2011 Awards of Excellence Program.
- The City of Riverside has achieved "Silver" status as a California Green Community for its commitment to sustainability.

RPU's continued investment in proactively marketing its wide array of energy efficiency programs to its customers has played a significant role in maintaining a high level of program participation despite the slow economic recovery.

The "pilot" Whole House Energy Efficiency Rebate Program initiated by ARRA funding retrofitted 244 homes and was the first of its kind in the nation. It helped to establish funding and incentive levels necessary to continue the program using PBC funds while local businesses utilized the program as an important marketing tool to remain viable during the economic downturn. As additional ARRA funds became available the ARRA funded program was extended through the end of fiscal year (June 30, 2012) retrofitting an additional 157 homes. This combination of ARRA and PBC funding has resulted in 1,369 participants in the Whole House Program since program inception in FY 09-10.

Although RPU programs continue to be successful in terms of customer participation numbers and the reported energy savings, many economic and programmatic challenges remain:

- RPU retail energy sales measured in kilowatt hours for FY 11/12 were just slightly above 2.1 billion kWh which is still below the nearly 2.2 billion kWh sold in FY 07/08. This is due in part to high commercial vacancy rates in certain market sectors such as office properties, fluctuations in average temperature, impact of "green" initiatives and successful EE programs. As the PBC surcharge is proportional to retail kWh sales, the PBC funding supporting RPU programs continues to be reduced while program demands have increased.
- The local economy, including both job and housing markets, has remained a challenge continuing to make investment in energy efficiency measures difficult for many Riverside homeowners and businesses. Although slowly improving, Riverside's unemployment rate is still higher than both the national and state averages.
- No cost/low cost small business direct install programs, CFL distributions and Free ShadeTree coupons have helped RPU to continue meeting its energy efficiency goals and helped to stimulate the economy. The increasing costs of continuing such programs at current funding levels may become a challenge in the future.

- While, RPU's low-income program (SHARE) participation levels have continued to decline from the FY 09-10 program participation high of 9,574, the funding level still exceeded $1,000,000 for the fourth consecutive year, which amounts to 14% of all PBC spending for FY 11-12.
- The California Solar Initiative (SB1) requires that RPU provide $2.5M annually from public benefit funds that could otherwise be spent on energy efficiency programs, research and development, and low income programs. RPU solar rebate programs currently represent 40% of all PBC expenditures. Both the commercial and residential PV programs have been very popular. Riverside achieved a major milestone by surpassing the 4 megawatt (MW) mark of clean, renewable energy that is produced by solar generation projects throughout the city.

RPU continued to focus its commercial energy efficiency programs on large Key Account customers as well as small businesses. The Small Business Direct Installation (SBDI) Program included an energy audit to identify and prioritize the energy efficiency measures best suited for the individual business. RPU contractors provide the direct installation of a variety of energy efficiency measures at little or no cost to the customer. RPU also piloted a Keep Your Cool program which specifically targets grocery stores, convenience stores, delis and markets with a variety of energy efficiency measures designed to reduce costs associated with refrigerated food and beverage storage and sales displays.

Riverside is committed to meeting the annual energy efficiency (EE) and conservation goals it has established through AB2021 for energy and demand reduction. The revised energy reduction goal of 232,503 megawatt-hours (MWh) over the next 10 years represents 1% of the revised Load Forecast completed in 2010. RPU will provide the required financial budget to meet these targets and will continue to develop new cost-effective programs that yield energy savings necessary to achieve the goals set forth by Assembly Bill 2021 (AB2021).

Customer Incentives

RPU is continually reviewing the programs and services offered to ensure cost effectiveness and to respond to the changing needs of our customers as well as the introduction of new energy efficiency technologies. The successful residential Whole House Rebate Program has now been fully transitioned to a PBC funded program now that ARRA funding has been exhausted. RPU residential programs continue to experience wide support and participation by customers. Continued emphasis on commercial energy efficiency programs to increase business participation in an effort to meet annual energy savings goals has resulted in new commercial programs such as the introduction of an HID Lighting Retrofit Program, the Commercial Weatherization Program and the Small Business Direct Installation (SBDI) Program. Below is a list of major residential and commercial energy efficiency programs currently offered by RPU. This list also highlights other programs and services offered by RPU in the areas of renewable energy, research, development and demonstration and low income assistance.

Commercial Rebate Programs

- Air Conditioning Incentives – rebates for replacement or first time purchase of energy efficient AC units.
- Energy Star – rebates for purchase of Energy Star refrigerators, dishwashers, commercial clothes washers, solid door refrigerator/freezers.
- Lighting Incentive – rebates for kWh savings on installation of energy efficient lighting.

- New Construction Incentive – rebates for energy savings exceeding Title 24 standards for new construction projects pre-approved by Riverside Public Utilities.
- Pool and Spa Pumps Incentive – rebates for purchase of qualifying energy efficient pumps and motors.
- Tree Power – rebates for purchase and planting of up to 5 qualifying shade trees per year.
- Thermal Energy Storage Incentive – feasibility study and incentives available for use of Thermal Energy Storage based on guidelines.
- Performance Based Incentive – rebates for customers who can demonstrate a kWh savings based on custom energy-efficiency measures.
- Commercial Photovoltaic Incentive – rebates for customers who install PV on their business to reduce peak load.
- Energy Innovations Grant for Post-Secondary Educational Institutions – for the funding of research, development and demonstration programs for the public interest to advance science or technology in electric-related projects in the institutions of higher education within the city of Riverside.
- Custom Energy Technology Grants – Grants are awarded for research, development, and demonstration of energy efficiency projects that are unique to the business or manufacturing process.

Direct Installation Commercial Programs

- Small Business Direct Installation (SBDI) – provides an audit and up to $1,000 in free energy-efficient measures including high efficiency lighting retrofits, HVAC Tune Ups, LED or electroluminescent Exit Sign replacement, Occupancy Sensors, Strip-Curtains for walk-ins and installation of vending/cooling misers.
- Keep Your Cool – provides targeted businesses a free evaluation of the efficiency of existing refrigeration equipment and the installation of a variety of energy efficient measures including door gaskets, strip curtains, door closures, LED case lighting, electric motors and controls.

Residential Rebate Programs

- Energy Star – rebates for purchasing Energy Star rated appliances that use less energy and water.
- Cool Cash – rebates for replacing Central Air Conditioners with a SEER rating of 15 or above.
- 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.
- Residential Photovoltaic Incentive – rebates for customers who install PV on their home to reduce peak load and offset high electricity bills.
- Pool Saver – rebates for purchasing efficient pool pump motor, and monthly credit for using pool pumps during off-peak hours.
- Weatherization – rebates for installing attic insulation or wall insulation, standard rebates for duct replacement, duct testing/sealing, window replacement, window film, solar and standard attic fans, whole house fans and cool roofs.
- Whole House (ARRA/PBC Funded) – rebates for completing two or more energy efficiency measures at a time. 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 more energy efficiency measures.

Special Residential Rates and Customer/Community Services

- Appliance Recycling – free recycling service for old inefficient refrigerators.
- Utilicare – provides reduced rates to households that require specific types of life support medical equipment.
- SHARE – credits up to $150 toward electric deposit or bill payment assistance for qualified low-income applicants annually.
- Green Power Premium – allows customer to donate an additional 2 cents per kilowatt hour above their current kWh rate to assist in purchasing renewable energy resources.
- Community Education and Outreach – RPU offers a comprehensive Education Program for Schools. This program targets 4th,5th and 6th grade students by educating students on energy, water and conservation through classroom presentations and mobile standards-based science lab kits that integrate into existing science classroom curriculum.

Photovoltaic Efforts (Solar)

RPU continues to promote residential and commercial participation in its renewable energy programs. 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.

RPU has a goal of installing 20 megawatts of local photovoltaic by 2020. During the last year there were 144 residential installations totaling 694 kW AC and 9 non-residential systems generating 559 kW AC of renewable solar energy. RPU currently has over 4 megawatts of photovoltaic systems installed and operational.

Research, Demonstration and Development (RD&D)

RPU continues to invest in RD&D programs through local higher education institutions, with a $100,000 grant to the University of California at Riverside (UCR) College of Engineering, Center for Environmental Research and Technology (CE-CERT) for research designing efficient miniaturized energy-storage devices. In addition, RPU granted $100,000 to California Baptist University, College of Engineering to fund research related to solar powered air conditioning systems. A Custom Energy Technology Grant was awarded to the City of Riverside Parks, Recreation and Community Services Department for installation of SolarBee Solar Powered Floating Aeration Devices to be installed at Fairmount Park's lakes. These devices are estimated to save over one-half million kilowatt hours per year. RPU also participates in SCPPA-related RD&D efforts and will continue to explore future research demonstration and development opportunities.

Demand Response/Smart Grid

In addition to the Power Partners voluntary load curtailment program implementing 14 megawatts of voluntary load shed capability for the summer of 2012, RPU continues to implement a commercial time-of-use rate to encourage off-peak energy use by its large customers. RPU is evaluating other demand response measures such as Smart Grid technology and Ice Bear applications.

Low Income Assistance

RPU continues to assist low income families through the Sharing Households Assist Riverside's Energy (SHARE) fund. RPU customers can donate a specified amount of money each month to the SHARE fund which is then supplemented by PBC monies to credit up to $150 toward electric deposit or bill payment

assistance for qualified low-income applicants annually. In FY 11-12 over $1,075,000.00 in credits were applied to assist over 7,100 low income families.

Evaluation, Measurement, and Verification (EM&V)
Riverside Public Utilities is committed to providing on-going evaluation, measurement and verification efforts for its energy-efficiency programs in support of AB2021. RPU has continued to provide feedback to CEC staff and their consultant regarding the proposed Recommended Evaluation Guidelines for Publicly Owned Utilities.

As part of the City's annual audit process RPU requested a separate program audit pertaining to its Energy Efficiency programs. The goal was to review rebate processes, procedures and supporting documentation. The final report includes findings and recommendations for program improvement.

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 for 100% of all commercial rebate participants, including a review of historical energy usage and energy-saving calculations.
- 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 outside engineering firms to verify claimed energy savings on large, complex or technical commercial projects prior to issuing an incentive.
- Audits and installations performed by third-party contractors for RPU direct installation programs have high inspection rates that are performed by the consultant and RPU staff.
- Refrigerator recycling program administered by Appliance Recycling Centers of America (ARCA) assures proper verification when the contractor is picking up old appliances for recycling.

Stimulus Update (ARRA Funding)
The City of Riverside was allocated $2,499,810 in Energy Efficiency Community Block Grant (EECBG) under the American Recovery and Reinvestment Act (ARRA) for energy measures.

The following energy projects were submitted and approved under the grant for the EECBG funding through ARRA:

- Government Building Retrofits – $308,030 was allocated for projects to include boiler and water pump replacement; heating, ventilating and air conditioning unit upgrades; and building automation for eight city facilities. Six of the eight projects have been completed and the remaining two are underway.
- Whole House Rebate Program – $714,000 was allocated to create a pilot program offering a "whole house" approach to energy efficiency through an elevated rebate program that provides greater incentives as more energy efficient measures are added to a home. The stimulus funded program improved energy efficiency in 244 homes. Monies left over from other projects were reallocated to the Whole House Rebate Program and the ARRA program was extended through the end of June, 2012 retrofitting an additional 157 homes.
- Personal Computer Management Software Rebate Program – $156,940 was allocated for this pilot program which offers software rebates allowing businesses to turn off PCs automatically saving

energy and money. The City of Riverside, Alvord Unified School District and Riverside Community College have installed the software on over 6,000 personal computers to date.

- Greenhouse Gas Community Inventory – $48,650 was allocated for URS Corporation to complete a community GHG emissions baseline to compliment a previously funded government facilities study.
- Solarized Trash Compactors and Recycling – $153,040 in grant funds were used to purchase and install 25 new trash containers and recycling units in public areas throughout the city. The compactors use solar energy to power compaction of the trash reducing the number of trips needed to empty the containers.
- PV Electric Vehicle Charging Storage System – $157,000 was allocated for the proposed project which will use a photovoltaic charging system to charge 12 golf carts, off-setting expensive peak power and providing green renewable energy.
- Street Lighting Retrofit LED – $254,050 was allocated to provide funding for approximately 200 additional energy-efficient light-emitting diode (LED) streetlights to improve public safety, lower energy use and save money.
- Lighted Street Name Sign Reduction – $450,030 was allocated to install approximately 1,000 "Diamond Grade 3 (DG3)" or LED street name signs to reduce maintenance costs and energy use.
- Specific Plan Updates – $258,070 was allocated to update specific plans to ensure integrated designs which incorporate elements to create an energy efficient/sustainable environment by reducing vehicle miles traveled and GHG emissions.

Riverside – Summary Energy Efficiency Programs, FY2012

Riverside		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	1,338	181	181	70,513	846,151	504	$100,350	$2,151	$102,501
HVAC	Res Cooling	15,361	732	749	2,279,922	67,231,719	44,326	$496,592	$285,117	$781,709
Appliances	Res Dishwashers	748	63	63	18,371	202,080	120	$37,400	$485	$37,885
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	18,697	1,527	210	1,320,462	6,651,098	3,773	$46,020	$14,097	$60,117
Pool Pump	Res Pool Pump	144	9	9	36,979	369,792	210	$28,800	$882	$29,682
Refrigeration	Res Refrigeration	3,745	266	266	1,251,193	7,849,021	4,430	$555,354	$17,891	$573,245
HVAC	Res Shell	283	52	52	71,543	1,399,993	904	$36,900	$5,972	$42,872
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	789			1,056,909	12,673,022	7,154	$824,050	$29,427	$853,478
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	2,230	289	315	634,774	12,098,338	7,649	$142,246	$37,575	$179,820
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	8,165	1,560	1,560	7,801,850	78,018,500	46,208	$690,868	$206,659	$897,526
Process	Non-Res Motors	4			267	1,068	1	$140	$2	$142
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	11	7	7	170,280	1,021,680	569	$45,523	$2,224	$47,747
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	11,551	2,074	2,074	6,050,786	53,741,869	30,659	$384,681	$127,531	$512,212
Other	Other	143,373			480,136	6,189,605	3,796	$356	$19,396	$19,752
SubTotal		206,439	6,762	5,487	21,243,985	248,293,936	150,302	$3,389,280	$749,409	$4,138,689
T&D	T&D									
Total		206,439	6,762	5,487	21,243,985	248,293,936	150,302	$3,389,280	$749,409	$4,138,689

EE Program Portfolio	TRC Test	**2.99**
	PAC Test	**7.47**

ROSEVILLE ELECTRIC UTILITY

Roseville Overview

- Roseville Electric (RE) was established in 1912 as department of the City of Roseville.
- Services the 31 square miles within Roseville city limits.
- 54,868 customers (48,219 residential and 6,630 businesses).
- 137 employees
- RE operates on a fiscal year which runs from July 1 through June 30.

Energy Sales

Energy Sales: Roseville Electric continued to be impacted by the sluggish economy and recession driven changes in consumer behavior in FY 12. Energy (GWH) sold during FY 12 increased slightly by 1.02% over FY 11. Residential and commercial vacancies and reduced per meter energy consumption is projected to continue to be affected by the sluggish economy in FY 13.

- Energy Sales/Power (GWH)
    - Total: 1,190 GWH
    - Residential: 440 GWH
    - Non-residential: 750 GWH
- Energy Sales/Dollars
    - Total: $ 154,380,995
    - Residential: $65,759,646
    - Non-residential: $88,621,349

Energy Efficiency and Public Benefits History

RE began offering energy efficiency programs in the early 1980's. From 2002 to 2012 these programs have resulted in peak demand reduction of 17 MW and cumulative energy savings of over 59,000 MWH.

- Total RE Revenues in FY 12: $155,244,836 (actual revenues)
- Mandated 2.85% Public Benefits Collection on Actual Revenue: $4,424,477.26
- Total dollars spent supporting Public Benefit programs: $ 4,670,284 (3.01%)
    - Spent on Public Benefit programs: 3.01 % of actual total utility FY 12 revenues
    - "Total Dollars Spent" includes all assigned administrative and program overhead costs.
    - Programs funded include: Low income rate assistance, Energy Efficiency, Demand-side management, Solar/renewable energy programs and Research and Development.

Roseville Program Highlights

- Total EE rebates only: $2,461,521
    - EE rebates only: expenditures equal 52.71% of total public benefit dollars spent.
    - EE rebates only: expenditures equal 1.59 % of total utility revenues.
- Total EE rebates with admin/overhead: $3,534,639
    - EE rebates with admin/overhead: equal 74% of total public benefit dollars spent
    - EE rebates with admin/overhead: equal 2.28% of total utility revenues

Energy Savings (kWh)

- Total kWh 5,569,799 kWh

- Residential kWh: 1,860,861
- Business (non-residential) kWh: 3,708,939

Demand Savings (kW)

- Total kW: 2,322
  - Residential kW: 1,547
  - Business (non-residential) kW: 775

Residential Programs

- **Energy Efficiency Incentives and Support Programs**: RE offers comprehensive technical support and incentives to facilitate installation of incrementally higher-efficiency , cooling and heating equipment, pool pumps, shade trees and some Energy Star ™ appliances for residential customers. Incentives are also offered for refrigerator recycling
- **Holiday Light Exchange**: RE launched its second annual holiday light exchange at the Utility Exploration Center in FY12, to introduce LED technology to our residential customers.
- CFL Exchange: RE launched a CFL exchange program in partnership with the Roseville Utility Exploration Center to encourage residents to replace incandescent lamps.
- **Energy Audits**: A free comprehensive online audit is available for residential customers. This audit is also a prerequisite for the installation of solar electric at the residential customer's home.
- **Residential New Construction Program**: RE provides incentives to residential new home production builders to exceed (perform better than) Title 24 energy budget. The Preferred Homes energy efficiency program and the energy efficiency portion of the BEST Homes energy efficiency and roof top solar electric programs are popular among local builders. Home buyers also are attracted to these high performing homes, often times desiring the results of energy efficiency and solar electric without having an understanding of how these benefits are produced.
  - In fiscal year 2011-2012, over 60 % of all new single family homes participated in the residential new construction programs.

- Residential FY12 energy efficiency rebate dollars spent: $1,568,719

Commercial Programs

- **Energy Efficiency Incentives and Support Programs**: RE offers comprehensive technical support and incentives to facilitate installation of incrementally higher-efficiency lighting, lighting controls, cooling and heating equipment, motor controls, shade trees and some Energy Star ™ appliances for commercial customers. RE also offers a commercial "customized energy efficiency rebate" opportunity which allows for a rebate for "whole building" impacts from accepted projects.
- **$1.0 million Department of Energy ARRA Grants** dollars were went spent IN ADDITION to Public Benefit funds in FY12 for energy efficiency in the non-residential building sector. These projects and savings are NOT reflected in this report.
- **Municipal Facilities**: RE continued an ongoing plan to upgrade the efficiency of municipal facilities beyond code requirements providing ongoing education and information to City Facility managers
  - Public Benefit funds were not spent on these projects in Fy12
  - Department of Energy ARRA Grants dollars were utilized
- **School Facilities**: RE assisted local schools with energy efficiency retrofits. RE also assisted with the installation of thermal energy storage at a local high school.

- **Small Business Programs**: energy efficiency program expense for small sized business was carried primarily by the Department of Energy ARRA Grants dollars in FY12. These projects and savings are NOT reflected in this report.
- **Mid-size and Large Business Programs**: RE offered incentives to implement energy efficient measures that reduced peak loads and energy consumption.
- **Custom Business Incentives**: The Customized Program is designed to provide rebates to mid-size and large business customers who install peak load reducing energy efficiency measures where the work is outside the regular program requirements.
- **Business New Construction Program**: The business new construction program provides assistance in binging energy efficiency into the design and construction of the facility. The goal is to control peak load and reduce overall energy use. The program includes lighting, mechanical, envelope and whole-building measures.

- Commercial FY12 energy efficiency dollars spent: $892,802

Low Income Programs

Total public benefit expenditures on low income rate assistance for FY 12 was $331,202. Low Income rate assistance equaled 7.09% of total public benefit dollars spent.

- The Roseville **Electric Rate Assistance Program** (ERAP) provides a 15% discount to the standard residential rate for qualified residential customers.
- The **Medical Rate Assistance Program**, (Med Rate) is offered to customers whose income is no greater than specified by HUD as "low income" for Placer County and who use a qualifying medical device. The discount is 50 percent of the standard residential rate for the first 500 kWh of usage per billing period and 15 percent of the standard residential rate for usage in excess of 500 kWh.
- The Roseville **Utility Exploration Center (UEC)** provides scholarships to "Title 1" schools to offset the costs for educational field trips to the UEC.

Solar Electric Program

Total public benefit expenditures on customer owned and operated SB1 compliant renewable energy (solar electric – PV) in FY12 was $493,677:

- Residential:
  - Total rebated: $469,034
  - Total energy savings(installed): .325 MW
- Non-residential:
  - Total rebated: $24,643
  - Total energy savings (installed): .3 MW
- Renewable Energy expenditures for SB1 compliant systems equaled 11% of total public benefit dollars spent

Demand Reduction

Total public benefit expenditures on demand reduction via a utility controlled radio frequency signal activated residential air conditioning load control system in FY12 ending June 30, 2012 was $126,328. Demand Reduction expenditures equal 2.70 % of total public benefit dollars spent.

- Residential central air conditioning load control program called Power Partners; implementation began in the summer of 2007.

- Utility control switches are the program activator
- Total installed kW of Reduction at year end FY 12: 3,919 kW

Research & Development

Total public benefits expenditures specific to research and development during FY 12 was $172,934. Research and Development expenditures equaled 4.89 % of total public benefit dollars spent. Roseville Electric participated in three research and development efforts during FY12:

- The **Utility Exploration Center** (UEC) is a 4,000 sq. ft. facility in Roseville dedicated to educating ratepayers and school children about energy conservation and a sustainable lifestyle. Open since 2007, UEC is attempting to quantify the contribution of education within the community to reductions in kWh and summer peak (kW) demand. Roseville Electric strongly believes that ratepayer education leads to greater energy efficiency and conservation. RE's incentive and energy efficiency programs are tied into the UEC programs through workshops, special events and the messaging of the interactive displays. The UEC partners with regional elementary schools to provide UEC tours to over 4,000 school children. These popular school tours are designed to meet state grade level educational standards and participation has increased 22% since 2011. In support of this belief, since 2005 Roseville Electric has invested over $2,200,000 in the design, construction and operation of the UEC. Roseville Electric contributed $160,446 to UEC operations in FY12. In addition, the UEC acts as the platform for direct program interface with our ratepayer's for select programs:
    - FY12 Holiday Light Exchange
    - FY 12 CFL Light Exchange
    - FY12 Earth Day
    - FY12 Solar Day
- **American Public Power Association / DEED membership** ($2,488): DEED is dedicated to increasing efficiency, reducing costs, investigating new technologies and services and improving processes and practices to better serve customers. DEED pools its members' resources to invest in the future technologies and best practices of the electric utility industry. DEED encourages and promotes energy efficiency innovation and funds innovative projects focused on the needs and research interests of its members.
- **California Lighting Technology Center (CLTC)** $10,000: 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.

Roseville – Summary of Energy Efficiency Programs

Roseville		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling	2,668	900	883	1,306,178	20,447,121	12,497	$1,196,252	$773,697	$1,969,950
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	5,558	546	18	195,563	1,008,256	538	$21,520	$11,382	$32,901
Pool Pump	Res Pool Pump	189	28	28	127,934	1,279,341	707	$56,700	$37,112	$93,812
Refrigeration	Res Refrigeration	427	37	37	170,658	952,115	516	$25,275	$12,085	$37,360
HVAC	Res Shell	103	19	19	22,830	228,300	129	$5,989	$10,159	$16,148
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive	1			687	13,740	8	$2,768	$197	$2,965
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	173	267	264	971,233	14,568,492	8,824	$148,628	$238,377	$387,005
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	32,537	495	495	2,187,999	24,296,403	13,465	$649,788	$225,051	$874,839
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	847	12	13	547,973	2,333,426	1,230	$94,146	$17,319	$111,464
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other	455	18	18	38,745	117,970	63	$240	$1,259	$1,499
SubTotal		42,958	2,322	1,775	5,569,799	65,245,164	37,978	$2,201,306	$1,326,637	$3,527,943
T&D	T&D									
Total		42,958	2,322	1,775	5,569,799	65,245,164	37,978	$2,201,306	$1,326,637	$3,527,943

EE Program Portfolio TRC Test	**2.49**

SACRAMENTO MUNICIPAL UTILITY DISTRICT

SMUD Overview

- Total Customers (year-end): 599,826
- Annual Energy Sales to Customers: 10,385,013 kWh (thousands)
- Record Net System Peak Demand – 1 hour: 3,299 MW (July 24, 2006)

SMUD Energy-Efficiency Program Highlights

- 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 2020. 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 2012, SMUD spent $37.7 million for residential and commercial energy-efficiency programs, compared to a budget of $35.7 million.[6] All expenditures are public-goods funded. These programs delivered 21.4 megawatts (MW) of peak-load reduction and 164.1 million kilowatt-hours (GWh) of annual energy savings, compared to annual goals of 27.1 MW and 169.0 GWh. An additional 10.3 MW of peak-load reduction and 10.7 GWh of annual energy savings were achieved through a State Energy Program (SEP) grant from the California Energy Commission (CEC).
- For 2013 residential and commercial energy-efficiency programs, SMUD has budgeted $37.7 million in PG funds.[7] These programs are projected to deliver 27.3 MW of peak-load reduction and 171 GWh of annual energy savings.

SMUD 2013 Energy-Efficiency Programs

Commercial/Industrial Retrofit Programs

Commercial/industrial energy efficiency retrofit programs for existing buildings and facilities are budgeted for $13.7 million, with goals of 11.5 MW of peak-load reduction and 80.1 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

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

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

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 retrocommissioning, process improvements, and data center storage projects that result in energy savings.

- Express Efficiency Incentives: 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 high-efficiency equipment.
- Prescriptive Lighting: Contractor-driven program that provides financial incentives to contractors who install specific energy efficient lighting products off of SMUD's Prescriptive Lighting menu. This program is available to all commercial and industrial customers.
- Complete Energy Solutions: Third party program using a single contractor to perform comprehensive energy audits of small and medium-sized businesses. Customer receives a customized report detailing recommended energy improvements, estimated savings, estimated cost and payback. Contractor then assist customer in hiring a SMUD Certified Trade Contractor to complete the project. Projects generally payback in less than two years.
- Distributor Incentives: Promotes the installation of energy-efficient packaged-HVAC equipment. Provides incentives to manufacturers and distributors to encourage warehouse stocking and marketing of high-efficiency packaged-HVAC units. These incentives are paid per sale of energy-efficient packaged-HVAC unit. The program will not be active starting in 2013. The program will transition into a mid-stream, contractor driven and customer facing program, in which commercial HVAC quality installation and maintenance will be addressed to ensure new systems are highly efficient and properly installed, and existing systems are maintained to optimize performance (refrigerant charge adjustment, airflow and economizer correction, etc.).
- 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).

Residential Programs

Residential energy-efficiency programs for existing homes are budgeted for $18.0 million, with goals of 13.7 MW of peak-load reduction and 81.3 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, attic and wall insulation, solar domestic water heaters, and cool roofs. One new program components will be added in 2013: heat pump water heaters for new or replacement water heaters. Participating contractors will be trained to properly installation and maintain the measure to ensure system performance and energy savings.
- Whole-House Performance: 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 Efficiency provides educational information to customers on the benefits of installing high-efficiency, variable-speed pumps and motors, and encourages customers to operate pool equipment during off-peak hours. Pool Efficiency 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.
- Home Electronics: This program has multiple implementation components: *Education*— Educate consumers on ways to reduce usage by the increasing proliferation of electronic devices in homes that consume energy even when turned off. *Collaboration*—SMUD, collaborating with other utilities, regional and national advocacy organizations, and the U.S. EPA, will influence electronics standards-setting, and will design and deploy program and best-practices guidelines to coordinate impacts of other developing home-electronics programs. *Incentives*—SMUD has implemented an upstream OEM- and retail-incentive program that can be replicated by utilities across the nation. Changes to the program in 2012 included the elimination of computer and monitor rebates in the second quarter.
- 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.
- Multi-Family (Apartment and Condominium) Retrofit: This program is designed to capture some of the significant energy-savings potential in existing apartments and condominiums and their common areas not addressed by current SMUD programs. The foundation of the program is developing business relationships among the key players affecting the multi-family (MF) market segment, for the sole purpose of maximizing the efficiency of MF energy use, and offering rebates and financing to help buy down the higher cost of efficiency improvements. The program targets, builds, and fosters relationships with property managers and owners of MF rental property, owners of condominiums, property-management associations, condo homeowners associations, vendors, and service providers.
- Solar Smart Energy Homes provide incentives and marketing support to builders to build homes that include PV and have net electricity consumption that is 60 percent lower than typical new homes.

Energy Efficiency Information/Education Programs

Information and Education programs are budgeted for $1.3 million, with goals of 2.1 MW of peak-load reduction and 9.7 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

- Peak Corp (Residential Air Conditioner Load Management): Customers volunteer 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.
- Voluntary Emergency Load Curtailment: Calls on commercial and industrial participants to reduce their electrical use by a pre-determined amount. There is no obligation and no penalty if the business is unable to respond to SMUD's request to reduce usage.

Measurement and Verification Plans

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 two 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 has awarded or is in the process of awarding contracts for consultants to perform evaluations of the following programs in 2013:

Residential—

- Appliance Efficiency
- Residential Energy Advisory
- Whole House Comprehensive (Single and Multi-Family)

Commercial—

- Prescriptive Lighting (persistence of savings and market potential)
- Custom Retrofit
- Savings By Design (new construction)

SMUD – Summary of Energy Efficiency Programs, FY2012

SMUD		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	519	79	79	210,195	3,152,925	1,364	$90,825	$370,814	$461,639
HVAC	Res Cooling	18,524	2,207	2,207	3,583,883	53,758,245	23,250	$1,716,450	$2,487,338	$4,203,788
Appliances	Res Dishwashers	181	8	8	19,005	285,075	123	$9,050	$127,201	$136,251
Consumer Electronics	Res Electronics	54,970	1,210	1,210	10,020,000	100,200,000	43,337	$835,415	$776,098	$1,611,513
HVAC	Res Heating	543	265	265	970,278	17,465,004	7,554	$263,355	$133,363	$396,718
Lighting	Res Lighting	2,085,050	5,500	5,500	50,380,000	418,154,000	180,852	$4,780,144	$2,536,421	$7,316,565
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	7,253	645	645	4,857,975	21,295,921	9,210	$257,650	$366,379	$624,029
HVAC	Res Shell	274	29	29	62,477	1,249,540	540	$10,080	$2,439	$12,519
Water Heating	Res Water Heating	16	4	4	46,304	926,080	401	$24,000	$4,621	$28,621
Comprehensive	Res Comprehensive	46,944	1,840	1,840	16,880,000	97,904,000	42,343	$5,080,016	$3,462,840	$8,542,856
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	49	927	927	13,285,550	199,283,250	86,190	$865,084	$996,546	$1,861,630
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	757	4,759	4,759	32,482,056	129,928,224	56,194	$4,801,149	$2,341,114	$7,142,263
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process	27	1,649	1,649	15,089,886	150,898,860	65,264	$805,862	$987,357	$1,793,219
Comprehensive	Non Res Comprehensive	474	2,451	2,451	14,492,920	178,758,400	77,313	$1,672,455	$1,716,535	$3,388,990
Other	Other									
SubTotal			21,573	21,573	162,380,529	1,373,259,524	593,935	$21,211,535	$16,309,066	$37,520,601
T&D	T&D									
Total			21,573	21,573	162,380,529	1,373,259,524	593,935	$21,211,535	$16,309,066	$37,520,601
EE Program Portfolio	TRC Test	**2.54**								

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

San Francisco PUC Overview

- The San Francisco Public Utilities Commission (SFPUC) Power Enterprise provides electricity to City and County of San Francisco (CCSF) municipal customers and other retail customers, serving approximately 2,300 accounts.
- FY 11-12 total electricity sales to municipal and retail customers: 973,773 megawatt-hours (MWh).[8]
- FY 11-12 peak demand: 153.7 megawatts (MW).
- Power Enterprise staff: 118.
- The SFPUC also provides water and wastewater services through its Water Enterprise and Wastewater Enterprise.

The SFPUC's Hetch Hetchy Water and Power system generates an average of 1.6 million MWh of clean energy each year. Power Enterprise's power supply portfolio also includes 7.4 MW of capacity from thirteen municipal solar photovoltaic installations as well as 2 MW of capacity from biogas cogeneration at the SFPUC Southeast Plant.[9] Power Enterprise provides power to meet the municipal requirements of the City and County of San Francisco, including power to operate San Francisco's streetcars, electric buses, street lights, traffic lights, SF International Airport, and other municipal buildings and redevelopment areas. In FY 11-12 Power Enterprise also provided 32% of Hetch Hetchy generation output to the Modesto and Turlock irrigation districts, and to other customers consistent with prescribed contractual obligations and federal law.

SFPUC through its Power Enterprise is CCSF's lead agency for energy efficiency programs for reducing municipal electricity and natural gas consumption; it also is the lead agency for several renewable generation programs, including municipal solar installations, other renewable energy projects, and CCSF's local solar incentive program, GoSolarSF.

Energy Efficiency Program Highlights

Power Enterprise considers energy efficiency to be an essential component of its resource portfolio, and an important element of its customer service. From 2003 through June 2012, $35.4 million in spending, directly funded by Power Enterprise, has resulted in approximately 10.1 MW of demand reduction and 43,000MWh per year of electricity savings.[10] In the current reporting period, FY 2011-12, completed energy efficiency projects are estimated to save 3,142 MWh of electricity per year, based on a utility cost of $4.02 million.

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[8] Both electricity sales and peak demand totals exclude wholesale customers.

[9] The SFPUC Wastewater Enterprise also owns and operates a second cogeneration facility at its Oceanside Plant. This generation is behind the meter and excluded from Power Enterprise's supply portfolio and sales.

[10] These investments also include funding for projects that resulted in 931,000 therms of annual natural gas savings; this SB1037/ AB2021 reporting focuses only on electricity savings.

Program level highlights for FY 2011-12 include:

- The Direct Install Program saved 1,952 megawatt-hours per year (MWh/yr) in electricity, including completing a significant HVAC energy retrofit at Hall of Justice;
- The Technical Assistance Program completed construction on a multi-site HVAC retrofit project for the Port of San Francisco;
- The Civic Center Sustainability District initiated construction for a major lighting retrofit at San Francisco's Main Library;
- The LED Streetlight Program developed a pilot program that will include installations of 140 fixtures for evaluation;
- The newly launched Commissioning and Design Review program assisted with the design and commissioning of the landmark San Francisco Public Utilities Commission Headquarters Building, which was opened for full occupancy in June 2012 and is expected to achieve a LEED™ Platinum certification.
- For the first time, the SFPUC released a public report benchmarking the energy use in over 300 CCSF public buildings. With the calendar year 2011 report, San Francisco became the first West Coast city to publicly disclose energy performance and ENERGY STAR ratings of its municipal facilities.

Energy Efficiency Program Goals and Objectives

Power Enterprise's energy efficiency programs have been developed as the result of CCSF's recognition of the importance of conserving scarce resources and reducing costs where possible. From there, specific program priorities have been shaped by numerous local ordinances and resolutions that set aggressive energy efficiency goals. Taken together, these local energy initiatives establish a firm policy commitment to develop and implement robust energy efficiency programs for CCSF's Power Enterprise customers, as well as for other San Francisco residents and businesses.

Examples of these local policy initiatives include:

- CCSF 's Climate Action Plan, developed per San Francisco Board of Supervisors Resolution Number 0158-02 in March 2002;
- The SFPUC's Electricity Resource Plan, first endorsed by the Board of Supervisors in 2002, with an updated Electricity Resource Plan endorsed by the Board in 2011;
- CCSF 's adoption of the State's Energy Action Plan in 2008, including the same priority of loading order – with energy efficiency first;
- CCSF's Climate Change Goals and Action Plan Ordinance (#81-08), which sets the goal of CCSF's electric system becoming greenhouse-gas free by 2030.

Municipal energy efficiency action is also called for in CCSF's Sustainability Plan, and in the San Francisco General Plan. The Existing Commercial Buildings Energy Performance Ordinance, adopted in February 2011, requires annual energy benchmarking for all nonresidential buildings greater than 10,000 square feet. (See implementation status below). To further improve energy efficiency, CCSF has revised its building codes for residential, commercial and municipal buildings to require all new construction to meet increasingly strict "green building" standards that minimize energy usage (i.e., 15% better than California energy standards) and to encourage the use of renewable power.

Current Energy Efficiency Programs and Services (FY 2011-12)
Power Enterprise's municipal customers include the San Francisco International Airport and its tenants, the SFPUC itself, the Port of San Francisco and some of its tenants, the Municipal Transportation Agency (Muni), the Department of Public Health, Recreation and Parks, and all other CCSF Departments. Other customers served by SFPUC include municipal streetlights, Fine Arts Museums, and redevelopment areas. Power Enterprise's energy efficiency programs for these customers are varied and in most cases tailored to the particular customer's circumstances. Note that in many cases, the energy efficiency services also reduce a facility's natural gas use, though only electricity savings is reported here.

Project costs and energy savings for each program are provided in the Summary Table at the end of this document. For purposes of this report, for each program area, the summary table includes Power Enterprise's total project costs and projected annual savings for those projects that have completed construction.

- **Direct-Install Program:** The purpose of this program, begun in 2008, has been to accelerate energy retrofits for municipal facilities in an era of budget cuts, and to help customers respond to new local Climate Action legislation. Known as the "General Fund Program," this program provides complete "direct-install" services to certain of the SFPUC's municipal customers for free, including: energy audit, design, 100% funding, contracting services, and project management, with a project-specific evaluation, measurement and verification (EM&V) analysis for almost all projects.

  The program is targeted for CCSF departments and agencies that are funded primarily through local tax receipts, fees, and federal/state-funded programs. These departments and agencies are considered hard-to-reach (due to their limited access to capital and specialized engineering services, and in most cases, to insufficient price signals). For this program, Power Enterprise developed the first-in-the-nation "job-order contracts" for lighting retrofit and HVAC retrofit contractors. The contracts allow the program to accelerate retrofits, and to control costs and quality, while meeting public sector competitive bid requirements. The program has completed energy retrofits at more than 50 municipal facilities since it was initiated in 2008. In FY 11-12, $3.4 million in direct-install projects were completed in ten facilities, with 1,952 MWh/yr in electricity savings.[11] Projects included Phase 1 of a comprehensive HVAC retrofit for the Hall of Justice, a deep HVAC retrofit project at a major homeless shelter/services facility, re-lighting of the Geary Street Tunnel, and new chillers for County Jail #1&2.

- **Investment Grade Audits and Technical Assistance:** This program provides guidance for revenue-generating departments and agencies to reduce their utility costs through informed retrofit investments. The program focuses on these "enterprise" departments, and offers as its core services investment grade energy audits; the program also offers technical assistance during design and construction of energy retrofits. In some cases, services include complete construction and project management. Power Enterprise has offered project financing to some projects through interdepartmental loans. In FY 11-12 a 7-facility HVAC retrofit was completed at the Port of San

[11] The projects also generated 154,000 therms/yr in natural gas savings for municipal customers.

Francisco, and active projects were underway with San Francisco International Airport which should result in significant savings in future years.

- **Civic Center Sustainability District:** In accordance with a partnership Memorandum of Understanding with the Clinton Global Initiative, this program demonstrates green, renewable and energy efficient technologies as a national model for sustainability in historic districts. The program focuses on seven municipal buildings. The effort employs new technologies in energy efficiency and coordinates with district steam upgrades, renewable energy generation, as well as water and wastewater management efforts. For energy efficiency projects, the program provides free energy audits, design, construction management, construction services, and full funding. No projects were completed in FY 11-12; however, construction had begun on a major lighting retrofit at the Main Library, and projects were under development at several other facilities which should generate savings, expected to be reported in future reporting cycles.

- **LED Street Light Conversion Project:** The LED Street Light Conversion Project aims to convert nearly 18,000 high pressure sodium street lights to LED street lights. Power Enterprise owns these street lights and generates the electricity used to power them, and is budgeting $16 million over two years to fund the conversion program. The purpose of the Street Light Conversion Project is to reduce energy use and maintenance costs, and to improve pedestrian and vehicular safety. Total costs and projected annual savings (6,700 MWh/yr) will be reported when the project is complete (expected in FY14-15). In FY11-12, due to the initial RFP's bid results, construction was delayed. In FY 12-13, the SFPUC will install 140 street lights, and pilot 8 wireless controls systems. With the knowledge gained from the pilot project, SFPUC management will utilize a new contract procurement approach, and implement the project in beginning in FY 13-14.

- **Green Commissioning and Design Review Program:** To support CCSF departments with development of green buildings, the SFPUC has contracted with three expert firms to provide building commissioning and related green building design review services. Services are available on a fee-for-service basis for municipal new construction and major renovations; for existing buildings the program offers retro-commissioning services. Power Enterprise has provided initial funding and pilot phase costs, and expects the program to be largely self-supporting by fees in the future.

  The commissioning services under this program assure that CCSF's participating green buildings are designed, constructed, commissioned and operated with emphasis on long-term efficiency, reliability and indoor air quality management. The building commissioning team works in parallel with a project's design, construction and operation teams to assure that building systems such as heating, cooling and lighting, are well designed and performance tested through the full range of operating conditions. In addition, the commissioning team ensures that facility staff are well trained to operate the buildings efficiently. In FY 11-12, the first project under this program was completed: the San Francisco Public Utilities Commission's new headquarters building, with estimated savings of 1,037 MWh/yr compared to new construction codes. Utility subsidies for technical assistance totaled $511,000.

- **Energy Benchmarking Program:** In February 2011, the San Francisco Existing Commercial Buildings Energy Performance Ordinance was approved by the Board of Supervisors and signed by Mayor Edwin M. Lee. The ordinance requires owners of non-residential buildings over 10,000 square feet to annually benchmark and disclose the energy performance of their buildings, using the U.S. Environmental Protection Agency (EPA) Portfolio Manager tool to obtain ENERGY STAR ratings when possible.

  In 2012, Power Enterprise released a report on calendar year 2011 energy performance for over 300 of San Francisco's municipal facilities, including more than 37million square feet of building area. The information in this report will help Power Enterprise and other City departments target resources to buildings that could benefit the most from energy-related improvements.

Cost-Effectiveness Criteria

Power Enterprise uses simple payback analysis as its primary cost-effectiveness criterion for energy efficiency projects. The analysis typically uses Power Enterprise's average cost of service to estimate cost savings for electricity usage reductions, and each facility's delivered cost of natural gas to estimate cost savings for natural gas usage reductions. For "direct-install" programs, projects usually target a 15 year simple payback (including soft costs and EM&V costs). Longer paybacks on individual measures are allowed under current program rules for long-life capital upgrades, for individual measures included in an overall project that meets the payback criteria, and for technology demonstration efforts.

Evaluation, Measurement and Verification (EM&V)

Currently, Power Enterprise's EM&V approach results a the large majority of energy efficiency retrofit projects including an individual M&V study, with some variations by program. For the Direct-Install ("General Fund") program, project-level M&V has been conducted for nearly every retrofit project. The program follows the International Performance Measurement and Verification Protocol (IPMVP). Each project currently includes an M&V plan with a sampling plan, a logging plan, an approach to data recovery and analysis, and a written report. Lighting projects are evaluated based on IPMVP Option A, which calls for a combination of measured data (from loggers) and stipulated data for kW reductions (from the California Standard Performance Contracting program). For mechanical projects, specific IPMVP options are selected for each energy efficiency measure, depending on conditions.

For the Audits and Technical Assistance ("Enterprise") program, EM&V varies from project-level M&V studies to simple field verification, depending on the level of capital investment by Power Enterprise. For the Civic Center Sustainability District program, representative projects are being selected for project-level M&V. The M&V approach for the Green Commissioning and Design Review program is currently being determined on a project by project basis. For reporting purposes, verified savings calculations, as they become available, are used to update estimated savings.

SFPUC Power Enterprise

Time Period: Fiscal Year 2011-2012

San Francisco PUC Power Enterprise	Resource Savings Summary (1)			Cost Summary (2)		
	Savings Summary (Completed Projects)			**Cost Summary (Completed Projects)**		
	kW	kWh/yr	Lifecycle kWh	Utility Incentive & Direct Install ($)	Utility Mktg and EM&V ($)	Total Utility Cost
Program						
Direct Install (General Fund)	369	1,952,548	31,533,265	$ 3,429,600	$ 77,748	$ 3,507,348
Technical Assistance (Enterprise Depts)	35	152,729	2,596,386	$ 77,882	$ 17,105	$ 94,987
Civic Center Sustainability District (2)	0	0	0	$ -	$ -	$ -
Commissioning and Design Review	235	1,037,023	25,925,575	$ 511,100	$ 22,000	$ 533,100
LED Street Lights (2)	0	0	0	$ -	$ -	$ -
Total	**639**	**3,142,299**	**60,055,226**	**$ 4,018,583**	**$ 116,853**	**$ 4,135,436**

(1) In addition to electricity savings, EE retrofits achieved natural gas savings of 154,000 therms per year.
(2) Costs for completed projects are reported in the year of completion. Some programs have no projects completing construction in FY2011-12.

Time Period: Fiscal Year 2012-2013 (Projected)

San Francisco PUC Power Enterprise	Resource Savings Summary (1)			Cost Summary (2)		
	Savings Summary (Completed Projects)					
	kW	kWh/yr	Lifecycle kWh	Utility Incentive & Direct Install ($)	Utility Mktg and EM&V	Total Utility Cost
Program						
Direct Install (General Fund)	316	1,947,763	29,216,441	$ 1,655,258	$ 51,269	$ 1,706,526
Technical Assistance (Enterprise Depts) (2)	0	0	0	$ -	$ -	$ -
Civic Center Sustainability District	88	453,000	7,248,000	$ 209,636	$ 9,000	$ 218,636
Commissioning and Design Review		739,931	18,498,281	$ -	$ -	$ -
LED Street Lights***	0	35	0	$ 142,500	$ -	$ 142,500
Total	**404**	**3,140,729**	**54,962,723**	**$ 2,007,393**	**$ 60,269**	**$ 2,067,662**

(1) In addition to electricity savings, EE retrofits are expected to achieve natural gas savings of 365,000 therms per year.
(2) Costs for completed projects are reported in the year of completion. Some programs have no projects completing construction in FY2012-13.

San Francisco PUC – Summary of Energy Efficiency Programs, FY2012

San Francisco PUC		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
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	1	52	52	136,160	2,723,200	1,516	$757,847	$16,119	$773,966
HVAC	Non-Res Heating	2			46,779	1,166,860	649	$311,814	$8,262	$320,076
Lighting	Non-Res Lighting	5	194	194	906,230	13,942,465	7,517	$1,013,688	$33,166	$1,046,854
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	6	393	393	2,053,131	42,222,701	23,313	$1,935,234	$59,306	$1,994,540
Other	Other									
SubTotal		14	639	639	3,142,299	60,055,226	32,994	$4,018,583	$116,853	$4,135,436
T&D	T&D									
Total		14	639	639	3,142,299	60,055,226	32,994	$4,018,583	$116,853	$4,135,436

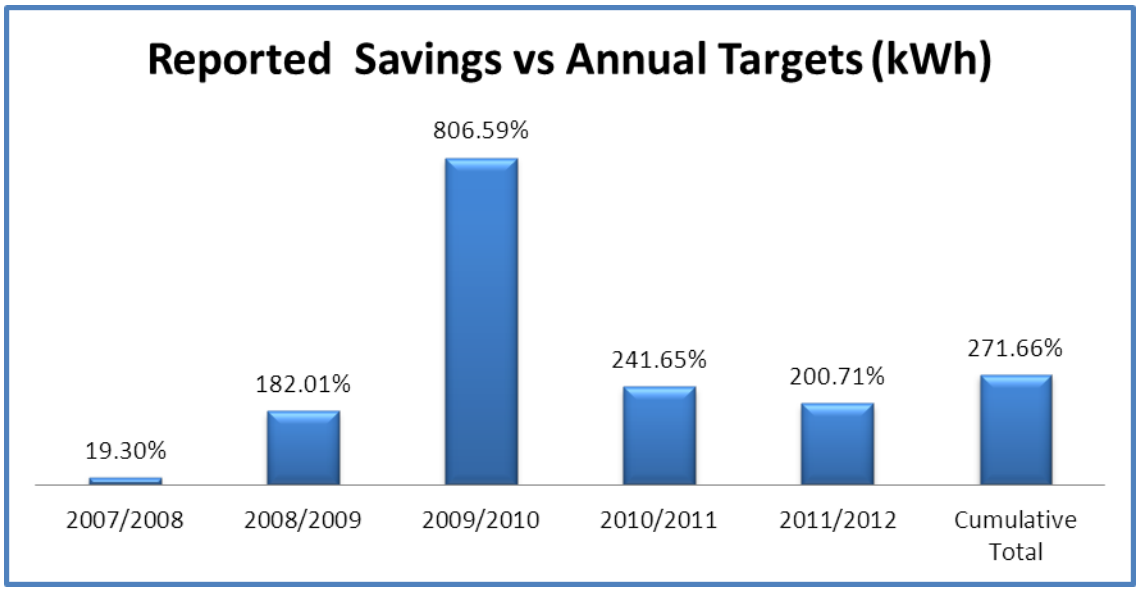
EE Program Portfolio TRC Test	**1.82**

CITY OF SHASTA LAKE

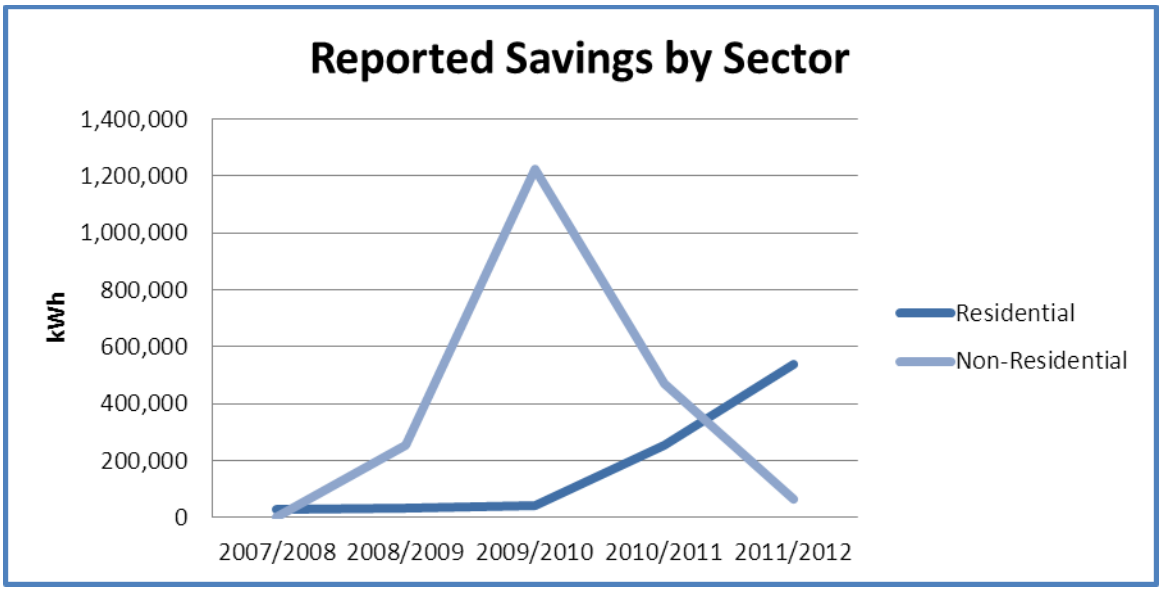
Shasta Lake Overview

The City incorporated in 1993 which included an electric enterprise formally known as the Shasta Dam Area Public Utility District which was established in 1945. The City is a load serving entity and distribution provider. The City owns and operates three small solar installations, the largest is 40 kilowatts and both are located on City facilities. The City provides retail electric service to customers located within the City's corporate limits, as well as certain adjacent areas and serves approximately 4,472 retail customers (meters), of which 4,113 are residential. Residential users account for 22.1 % of annual retail sales. All other accounts (some small commercial and large industrial) account for 77.9% of sales. The City's power and energy requirements are greatly influenced by residential customers, with year-to-year variations in peak demand and energy sales representative, in part, of the effect of local weather conditions on the residential class usage patterns. Peak demand was 31.56 megawatts on August 13, 2012, at 6 pm. Total FY12 sales were 175,668,619 kilowatt hours.

Pursuant to Assembly Bill 2021 (AB 2021), every 3 years the City establishes annual targets for energy efficiency savings and demand reduction for the next 10-year period. The reported results highlight the City's commitment to energy efficiency programs and a continued trend of surpassing the annual targets.



Historically, non-residential lighting programs have provided the largest share of energy efficiency savings to public power utilities. Despite the fact that non-residential lighting is much more cost-effective than residential energy efficiency upgrades, the City increased residential rebates beginning in fiscal year 2010/2011 in order to encourage more activity in the residential sector. Not only was the City successful in boosting activity, it was able to do so while maintaining an overall TRC greater than 1.0.



Overview of Shasta Lake Energy Efficiency Programs

The City of Shasta Lake 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.

Residential Customer Programs:

- Energy Efficiency Hotline: A toll free line is available for the city's electrical customers to answer questions and provide information on energy efficiency and energy savings-related matters.
- Free Energy Audits: On-site energy audits by city energy specialists 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 and/or additional visits to answer questions.
- Rebate Program: Comprehensive technical support and incentives to facilitate installation of higher efficiency cooling and refrigeration equipment, envelope measures, ENERGY STAR® appliances, and lighting for residential customers.
- Direct Install Program: Energy efficient compact fluorescent lamps (CFLs) and low-flow showerheads are installed in residential homes at no cost to the customer.
- Weatherization Incentives: Shasta Lake provides financial incentives for homeowners who invest in weatherization measures, including insulation and window treatments/replacements.

Commercial/Industrial Customer, Schools and Public Facilities Programs:

- Free Energy Audits: Shasta Lake offers free, on-site energy audits for both commercial and industrial customers. Energy efficiency recommendations and followup visits support implementation of recommended energy efficiency measures. Rebates are available for energy

efficiency upgrades identified in these audits. Verification services, to ensure appropriate installation of recommended measures, are also provided.

- Commercial Lighting Rebate Program: A commercial lighting retrofit program is offered to businesses in the city's electric service territory. There is a prevalence of T-12 lighting throughout the city and most high bay lighting uses high intensity discharge fixtures instead of more efficient florescent fixtures. Shasta Lake provides technical assistance and financial incentives for the installation of energy efficient lighting upgrades.
- Commercial Refrigeration Direct Install Program: A commercial refrigeration retrofit program, Keep Your Cool (KYC), is offered to businesses in the city's electric service territory. The KYC contractor audits the age and condition of existing refrigeration equipment and makes recommendations to improve the energy efficiency of equipment. Efficiency measures installed in the KYC program include programmable EC motors, motor controllers, anti-sweat heater control units, LED case lighting, door gaskets, auto door closers and strip curtains.
- Custom Energy Efficiency Projects: Shasta Lake financial incentives for commercial customers are based on site-specific consumption. Incentives are tailored to the individual customer needs based on the audit and the potential energy savings.

Shasta Lake Demand Reduction Programs:
Remote-read meters have been rolled out to nearly all customers. It is anticipated that this remote meter reading system will allow the City to implement an interruptible load program, time of use metering and other such programs when such services will benefit the citizens of Shasta Lake.

Performance Results for FY2012
Shasta Lake's AB 2021 energy savings target for FY2012 was 300,000 kWh. In FY2012, the city exceeded their target by 101%, with a total net energy reduction of 602,133 kWh.

Shasta Lake's AB 2021 demand reduction target for FY2012 was 81 kW. In FY2012, the city surpassed their annual target, with a total demand reduction of 723 kW.

Contrary to previous years, the residential sector contributed the bulk of kWh savings and demand savings in FY2012. The Direct Install Program served a total of 845 residential customers with free installation of energy efficient lamps and showerheads, yielding a net savings of 437,075kWh and net demand reduction of 520 kW (representing the greatest impact on savings).. Three businesses received free commercial refrigeration retrofits under the Keep Your Cool Program, yielding a net savings of 60,625 kWh and net demand reduction of 10 kW. One custom commercial project was completed, while no commercial lighting projects were completed.

The City of Shasta Lake's FY2011 EE Program Portfolio had a Total Resource Cost (TRC) of 1.18. In comparison to FY2011, the city reported 122,810 kWh less (-17%) at a cost of $76,894 more (22%). A major factor in these results was a significant shift in activity from the commercial sector to the residential sector, as rebate offers in the residential sector are less cost-effective for the city.

FY2013 Forecast
The City of Shasta Lake is forecasting that it will meet the AB 2021 targets by continuing to offer a comprehensive suite of energy efficiency rebates and other program offers, with the commercial sector

contributing the vast majority of the energy savings. Additionally, the city implemented a comprehensive Residential Audit Program in August of 2010 which successfully increased uptake in the residential sector (234 rebate requests were processed in FY2011 versus 109 in FY2010) and this trend is expected to continue.

The city's energy efficiency rebates were revised for FY2011-FY2013 based on the Measure Quantification Report issued by KEMA in December 2009. The FY2011-FY2013 energy efficiency program reflects a comprehensive suite of measures which encourages residential upgrades through increased rebate levels. The EE Reporting Tool forecast indicates that the FY2013 target of 300,000 kWh can be met with a funding level of $269,000 for rebates and administration. The city anticipates the FY2013 funding level of $338,000 will support the same level of residential rebate activity, a 50% decrease in Direct Install activity, and a 50% increase in Keep Your Cool activity; this forecast yields 437,922 kWh and a TRC of 1.04.

Shasta Lake Evaluation, Measurement and Verification

Shasta Lake completed their EM&V report in early 2011. The report focused on the program that produced the largest amount of savings during the 2009/2010 year, the commercial lighting program. The report can be found on the City's website.

The city has procured a contractor to perform their EM&V report for FY11. The report will focus on Appliances and Weatherization.

Shasta Lake – Summary of Energy Efficiency Programs, FY 2012

Shasta Lake		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	14	14	14	5,605	67,259	37	$2,100	$10,410	$12,510
HVAC	Res Cooling	1,954	4	5	4,053	67,004	41	$9,638	$8,045	$17,683
Appliances	Res Dishwashers	18	3	3	950	10,454	6	$2,160	$1,619	$3,779
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	46	521	520	438,164	2,628,223	1,403	$99,829	$16,149	$115,978
Pool Pump	Res Pool Pump	4			1,644	16,440	9	$1,000	$2,488	$3,488
Refrigeration	Res Refrigeration	57	1	1	7,469	103,811	56	$8,350	$14,707	$23,057
HVAC	Res Shell	919	160	160	51,968	1,237,180	709	$155,859	$52,975	$208,833
Water Heating	Res Water Heating	1			206	2,681	1	$200	$547	$747
Comprehensive	Res Comprehensive	1	7	7	28,292	113,168	64		$738	$738
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	1	10	10	60,625	363,750	192	$20,350	$7,681	$28,032
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	1	1	1	3,155	126,208	70	$4,165	$2,090	$6,255
Other	Other									
SubTotal		3,016	723	722	602,133	4,736,179	2,589	$303,651	$117,450	$421,101
T&D	T&D									
Total		3,016	723	722	602,133	4,736,179	2,589	$303,651	$117,450	$421,101

EE Program Portfolio TRC Test	**1.18**

SILICON VALLEY POWER

Silicon Valley Power (City of Santa Clara) Overview

- Established in 1896
- 52,378 customers; 84% are residential customers but only 8.5% of power sales are residential. 87.7% of sales are to the 1,796 industrial customers. SVP projects an average increase of 4% annually in sales.
- Peak demand: 471.4 megawatts in 2011; 72.6% load factor.
- Annual energy use: 2,862 gigawatt-hours in 2011.
- Has invested in joint ventures that produce electric power and trades on the open market. 25.1% of its power comes from geothermal, wind, and other eligible renewable sources.
- The City of Santa Clara employs 135 in the Electric Department, Silicon Valley Power (SVP).
- SVP mission: To ensure the citizens, organizations and businesses of Santa Clara a low-cost, reliable and stable source of electric power.

SVP Energy Efficiency Program Highlights

SVP's Public Benefit Programs are separated into residential and business programs, with the majority of funding toward the business sector since that is the customer class that represents 90.9% of the sales. Total program expenditures are about $6-7 million per year. Total program cost for energy efficiency programs in fiscal year 2011-2012 was $3,386,784 ($6,697,053.36 on all public benefit programs), resulting in 3,234 kW net demand reduction and 19,225,205 kWh net reductions. Since 1998, total program costs for all public benefit programs were $79,405,865.84, resulting in over 315.9 million kWh in cumulative first year savings.

SVP's goals and objectives for implementation of energy efficiency programs include:

- cost-effective programs to lower energy use
- programs that create value to for the community and meet all applicable legal requirements.
- programs that assist Divisions and City Departments in achieving optimal energy efficiency at City facilities and assist in implementing new energy related technologies for the benefit of the City and community
- programs to support renewable power generation that increase resource diversity and minimize adverse environmental impacts from electric generation and operation of the electric system.
- programs that support emerging technologies
- programs that assist low-income residents in paying their electric bills and installing energy efficient appliances and other measures.
- determination of the best energy programs to offer Santa Clara customers by collecting input from community organizations, businesses and other City departments.

Current Commercial Customer Programs:

- Business Audits: Free energy efficiency audits to business customers.
- Rebates: A comprehensive portfolio of energy efficiency rebates (for purchase and installation of energy efficient lighting, air conditioners, motion sensors, programmable thermostats, new construction, and customized energy-efficiency installations).

- Retrocommissioning (RCx): Provides commissioning and retro commissioning services to data centers, commercial buildings, educational facilities, and hotels.
- Laboratory Energy Management Program: This program focuses on the unique needs of energy-intensive laboratory space. The program provides recommendations for energy savings, technical analysis and rebates for energy efficiency retrofit projects.
- 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.
- SVP Sustainable Preschools Program: This program targets preschools and will provide technical assistance, contractor management and incentives for the installation of energy efficiency measures.
- Data Center Airflow Optimization Program: This program targets data centers up to 15,000 sf located within office buildings or other space. Airflow optimization is a cost-effective ways to save energy in this market segment where the data center may be a small percentage of the total facility square footage, but is a large percentage of the energy use.
- Business Energy Information: Management information on energy usage through 15-minute interval meters, Itron's 'EEM Suite' software, training, and other sources.
- Energy Innovation Program: 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.
- LEED Rebate for Energy Efficient Building Design: If your building meets LEED criteria and exceeds Title 24 energy requirements by at least 10 percent, you can get a rebate of up to $47,500.
- 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 that started at $3.00 per output watt up to a total of $300,000 per customer for systems up to 100 kW. (Current rebate level at the time of this report is $1.10 per watt.) Businesses installing systems between 100kW and 1 MW are eligible for a Performance Based Incentive starting at $0.40 per kWh. Current rebate level at the time of this report is $0.15per kWh.) Businesses are required to complete an energy audit in order to receive a rebate, as is the case with the statewide California Solar Initiative.

Current Residential Customer Programs:

- 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 (four compact fluorescent lights, "lime lite" night lights and switchplate thermometers). The Solar Explorer and the SVP information booth participate in major city events, providing education on energy efficiency and solar electric generation systems.
- Residential Appliance Rebates: Rebates encourage residents to purchase and install ENERGY STAR® labeled refrigerators or window AC units and recycle their old units.

- 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.
- 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.
- Solar Attic Fan Rebates: This program encourages customers to cool the attic space with a solar attic fan. By reducing the attic temperature, the insulation is more effective at stopping heat from entering the home, thereby reducing the need to cool the living space.
- Whole House Fan Rebates: This program encourages customers to cool their home off in the evening with a whole house fan. By drawing in cool outside air and exhausting the hot air accumulated during the day, this reduces the need to cool the living space when customers arrive home in the evening.
- Residential Attic Insulation Rebates: These rebates encourage the installation of attic insulation by providing incentives for both single-family and multi-family units. All homes are inspected to ensure installation has been completed.
- LED Light Bulb Rebates: SVP offers a $15 rebate per Energy Star LED bulb, up to a maximum of 6 bulbs per household.
- 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. The third installation is located at the Bill Wilson Center and was completed in the Fall of 2010.
- Rate Assistance Program: Qualified low-income customers receive a discount on their electric bill (low-income program).
- Low Income Refrigerator Replacement Program: This program replaces old, inefficient refrigerators with new Energy Star refrigerators for qualifying low income customers at no cost to the customer.
- Low Income Holiday LED Light Exchange: This program allows qualifying low income customers to exchange up to 10 strands of working incandescent holiday light strings with energy-efficient LED holiday light strings at no cost to the customer. Old incandescent string cords are cut and the strings are then recycled with a local recycler to ensure that they are not used again.
- Refrigerator & Room Air Conditioner Recycling: Rebate for recycling old refrigerators and room air conditioners.
- 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 $2.00 per watt, up to a maximum system size of 10 kW.

Current Community Programs:

- 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.

Proposed Energy Efficiency Programs and Services: **(for 2012-2013)**
(Continuation of Existing Programs)

Commercial Customer Program:

- Small Business Efficiency Services Program
- Business Audits
- Business Energy Information
- Business Rebates
- Data Center Efficiency Program
- Energy Innovation Program
- LEED Rebate for Energy Efficient Building Design
- Business Solar Photovoltaic Rebate
- Data Center Airflow Optimization Program

Residential Customer Programs:

- Residential In-Home Energy Audits, Education, and Hot Line
- Residential Appliance Rebates
- Residential Insulation Rebates
- LED Light Bulb Rebate
- Neighborhood Solar Program
- Rate Assistance Program
- Low-Income Refrigerator Replacements
- Low Income Holiday LED Light Exchange
- Refrigerator Recycling
- Electric Heat Pump Water Heater
- Energy Star Ceiling Fan Rebates
- Solar Attic Fan Rebates
- Whole House Fan Rebates

Community Programs

- Public Facilities' Energy Efficiency Program

(Modifications to Existing Energy Efficiency Programs and New Programs)
Business Customer Programs

- SVP Sustainable Preschools Program: This program targets preschools and will provide technical assistance, contractor management and incentives for the installation of energy efficiency measures. This program ended on June 3012 and will not be extended for FY 2012-2013.
- Laboratory Energy Management Program: This program focuses on the unique needs of energy-intensive laboratory space. The program provides recommendations for energy savings, technical analysis and rebates for energy efficiency retrofit projects. Since no additional customers indicated an interest to participate, the program was not extended and ended March 31, 2012.
- Retrocommissioning (RCx): Provides commissioning and retro commissioning services to data centers, commercial buildings, educational facilities, and hotels. This third party program ended June 30, 2012 and has not been renewed at this time due to lack of customer participation.

- Business Rebates: Additional LED lighting rebates and hotel occupancy controls will be added. In addition, SVP will add a performance-based incentive for controls systems under a pilot rebate program. The incentive will require demonstrated energy savings over a 5 year period and will make payments annually upon submission of a verification report.

Residential Customer Programs

- LED Light Bulb Rebates: SVP will add a rebate of $15 per Energy Star bulb up to 100 bulbs for Homeowners Associations who wish to install them in common areas .
- LED Television Rebate: SVP offered a limited-time rebate for LED back-lit and LED edge-lit televisions during the peak shopping season for televisions, which is November 1, 2011-January 31, 2012. This was a one-time program that will not be repeated in future years.
- Refrigerator & Room Air Conditioner Recycling: Because there is not much of a secondary market for old window air conditioning units, there is not much of an energy savings that can be claimed from recycling programs any longer. Therefore, we are considering discontinuing paying a rebate for recycling old AC units.

Energy Efficiency Conservation Block Grant (EECBG) Programs

The City of Santa Clara was awarded $1,180,900 in stimulus funds under the EECBG funding opportunity. These programs are being administered under the municipal electric utility, Silicon Valley Power, and will be spent on the following programs:

- Retrocommissioning (RCx) of City Facilities
- LED Pedestrian Signal Retrofits
- A Photovoltaic System on a park facility at Henry Schmidt Park
- LED Lighting retrofits at various locations around the City of Santa Clara
- A Low Income & Multi-familyWeatherization Program

All projects have been successfully completed, as the grant period ended in December 2012.

Demand Reduction

SVP has a load factor of 72.6%, primarily due to a large percentage of sales to large high tech firms that operate three daily shifts daily, 365 days per year. Because of the relatively mild climate, residential customers often do not have air conditioning, and do not have the peak in energy usage that occurs in other parts of the state.

Due to this very high load factor, SVP's former demand response program was a voluntary load-shedding program called the "Power Reduction Pool", developed in response to rolling blackouts during the energy crisis in 2000. Through a voluntary arrangement, participating customers reduced their load by at least 200 kW during system emergencies. This program was placed on hold in 2012 due to a reduction in the amount of customer load available for voluntary reduction. The Power Reduction Pool has been replaced with the Predetermined Manual Load Shed List. In preparation for the possibility of a Load Shed event, the Electric & Water System Operators will maintain a list of ten or more 12kV feeders that can be immediately manually shed if required. This list of feeders should represent approximately 50 MW of load. The criteria used to select feeders on this list will seek to minimize the shedding of critical load components essential to the health safety and welfare of the community. In addition, one industrial customer is on an interruptible rate. This customer is interrupted for both economic and system emergency conditions.

Evaluation, Measurement & Verification (EM&V)

Silicon Valley Power contracted with Summit Blue Consulting, LLC to create an EM&V plan, which was delivered in Fall 2008. Resulting from that plan, SVP contracted with Summit Blue to perform the evaluation of its FY 2007-2008 energy efficiency programs, which was completed in January 2009, and the FY 2008-2009 energy efficiency programs, which was completed in December 2009. Summit Blue was acquired by Navigant Consulting and evaluated SVP's FY 2009-2010 energy efficiency programs under the new name. SVP contracted with The Cadmus Group for its FY 2010-2011 study and is utilizing them again for the FY 2011-2012 study. Results of this study are expected in February 2013. Copies of all of SVP's EM&V studies are available on the NCPA website along with studies performed for other utilities.

Silicon Valley Power – Summary of Energy Efficiency Programs, FY2012

Silicon Valley		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	38	5	5	2,003	24,031	13	$3,800	$6,352	$10,152
HVAC	Res Cooling	72	1	1	3,274	39,492	24	$4,850	$30,223	$35,073
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics	311	3	3	29,343	117,371	63	$14,325	$35,806	$50,131
HVAC	Res Heating									
Lighting	Res Lighting	1,420	114	2	47,600	322,657	172	$14,343	$86,080	$100,423
Pool Pump	Res Pool Pump	10	1	1	2,215	22,149	12	$2,000	$5,474	$7,474
Refrigeration	Res Refrigeration	154	3	3	15,234	213,275	116	$44,700	$96,465	$141,165
HVAC	Res Shell	53	12	12	12,331	246,624	150	$9,275	$121,534	$130,809
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	350	2,395	2,378	15,766,267	311,545,061	164,271	$1,198,010	$953,261	$2,151,271
HVAC	Non-Res Heating	23			14,402	216,023	131	$1,125	$8,519	$9,644
Lighting	Non-Res Lighting	18,367	635	563	2,774,373	29,157,110	15,946	$404,074	$180,114	$584,188
Process	Non-Res Motors	2	1	1	18,094	141,548	75	$1,700	$2,570	$4,270
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process	62	64	64	540,070	6,153,295	3,274	$53,413	$53,309	$106,722
Comprehensive	Non Res Comprehensive	4						$55,461		$55,461
Other	Other									
SubTotal		20,865	3,235	3,032	19,225,205	348,198,635	184,247	$1,807,075	$1,579,709	$3,386,784
T&D	T&D									
Total		20,865	3,235	3,032	19,225,205	348,198,635	184,247	$1,807,075	$1,579,709	$3,386,784

EE Program Portfolio TRC Test	**3.19**

TRINITY PUBLIC UTILITY DISTRICT

Trinity Overview

- 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.
- 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.
- Serves small economically depressed area in northern California consisting of approximately 7,500 meters in mountainous terrain covering an area the size of Delaware.
- TPUD is comprised of nine small substations serving 560 miles of distribution line.
- TPUD has a peak coincident demand of approximately 22 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 Energy Efficiency Program Highlights

Since FY 2000 through FY 2012 TPUD public benefits expenditures on energy efficiency total approximately $450,000 and have resulted in kilowatt-hour energy savings equivalent of more than 236,000 kilowatt-hours.

Current TPUD Energy Efficiency Programs

- 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).

Proposed TPUD Energy Efficiency Programs and Services

- Maintain existing programs at current levels.

TPUD Demand Reduction Programs

TPUD does not have much of an air conditioning load and measures the demand of only two of its customers, none of the TPUD's power costs is dependent on demand and therefore the TPUD has no plans to implement a demand reduction program.

Trinity – Summary of Energy Efficiency Programs, FY2012

Trinity PUD		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers									
HVAC	Res Cooling	18	3	2	14,931	373,275	226	$12,600		$12,600
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting									
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration									
HVAC	Res Shell	9			102	1,126	1	$16,379		$16,379
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		27	3	2	15,033	374,401	227	$28,979		$28,979
T&D	T&D									
Total		27	3	2	15,033	374,401	227	$28,979		$28,979

EE Program Portfolio TRC Test	**2.65**

TRUCKEE DONNER PUBLIC UTILITY DISTRICT

Truckee Donner Overview

- Established in 1927
- 13,219 customers, 88 percent are residential
- TDPUD projects an average growth rate of 1 percent per year, for the next 10 years
- 2012 Peak demand – 36.9 megawatts (winter peaking)
- 2012 Energy Use – 146 gigawatt-hours

TDPUD Energy Efficiency Program Highlights

- In 2012 (calendar-year accounting), the Truckee Donner Public Utility District (TDPUD) continued to make significant investments in our Public Benefits and energy efficiency programs. This included Public Benefit and energy efficiency spending of ~4.5% of retail sales with a 2013 budget also at ~4.5% of retail sales. Over 3% of retail sales are spent directly on energy efficiency projects. In 2012, the TDPUD's energy efficiency results included a first year energy savings of almost 1.9% of retail sales with a TRC of 2.38. These results are slightly lower than 2011 due to saturation of some very cost-effective programs and increased cost per CFL as the TDPUD moves from standard 60-watt equivalent spirals to more costly specialty CFL's.
- In 2012, the TDPUD continued to grow three new energy efficiency programs (Residential Energy Survey, Green Schools – 'Trashion Shows', and Neighborhood Resource Mobilization/Block Party Programs) that expanded our offerings to residences and income qualified customers. The TDPUD continued to serve our business customers with emphasis placed on Commercial Lighting Rebates with a 'Last Chance T12' campaign and new LED lighting projects. The TDPUD targeted the most cost-effective programs and partnered with local agencies, businesses, and community groups to effectively implement programs. The TDPUD is seeing increasing acceptance of the economic and community benefits of energy efficiency investments.
- The TDPUD's message of 'Save Energy, Save Money' continues to gain traction with our customers. However, the customer's ability to make the investments necessary to implement cost effective energy efficiency projects remains diminished. This was particularly true with our commercial and small business customers. To address this, the TDPUD focused on direct-install and give-a-way programs along with trying to find ways to link customers to qualified vendors and to bring financing options to TDPUD customers.
- The TDPUD updated our 10-year energy efficiency targets in 2012 as part of the SB1037/AB 2021 requirement. For the period from 2014 through 2023, the energy savings target is: 12,837MWh (0.80% per year). The targets take into account the TDPUD's strong past energy efficiency results. However, the new targets also recognize that past results were heavily influenced by screw-in CFL residential lighting programs (note: The TDPUD is 88% Residential) which the TDPUD is beginning to saturate and which, unfortunately, are being prematurely discounted by the regulatory bodies.

2012 Highlights Include:

- Implemented programs with a verified reduced electric usage of almost 1.9% in the first year. The District was able to achieve this performance through a combination of cost-effective measures

(mostly lighting), effective program management, and leveraging the District's position within the community.

- Created an Evaluation, Measurement, & Verification (EM&V) Plan for calendar year 2012 programs and completed the final EM&V report within 3-months of calendar year 2012 end. The EM&V report concluded: Net Annual kWh Savings of 2,734,763 kWh, Net Lifecycle kWh Savings of 26,013,147 kWh, Net Peak kW Savings of 2,635 kW, and a TRC of 2.38.
- Delivered public benefits and energy efficiency programs for a cost of less than $0.033/kWh which is less than one half of the District's power purchase costs and a small fraction of the customer's rate.
- Completed a significant TDPUD headquarters LED lighting project which involved retrofit and new installations of approximately 500 linear tubes, 50 flood and 75 exterior LED lamps. Preliminary estimated net annual energy savings are 44,750 kWh and net lifecycle energy savings are 1,100,000 kWh. The TDPUD is preparing a case-study on the performance and cost-effectiveness of this project to share with our commercial customers and other utilities.
- Continued to deliver the District's income qualified program, Energy Saving Program (ESP), targeting residential energy efficiency and weatherization measures (many low-income customers have electric heat). This innovative program provides a one-time bill credit for the customers largest bill in the last 12-months (up to $200) but also required that the customer participate in a free energy survey of their home and that they agree to install energy conservation measures provided for free at the time of the survey (seven types of CFL's, piping/water heater insulation, door sweeps, etc.). To implement the program, the TDPUD partnered with a local non-profit (Family Resource Center of Truckee) to do the outreach and qualification for the program and worked with local energy efficiency experts to conduct the residential energy surveys. ESP was very successful in providing immediate assistance in the challenging economy, enabled the customer to reduce energy usage over time, and strengthened the TDPUD's relationship with our low-income customers and the overall community.
- Expanded the Residential Energy Survey (RES) Program which is the free energy survey component of the TDPUD's low-income program and the TDPUD now installs up to 24 CFL's and 2 low-flow showerheads. RES includes a walk-through visual survey of a customer's home and energy conservation measures provided for free at the time of the survey (Seven types of CFL's, piping/water heater insulation, door sweeps, etc.). The TDPUD estimates that this program has a simple payback of 2-3 years along with tremendous educational and customer relationship benefits.
- Partnered with the Truckee Tahoe Unified School District (TTUSD) and the Sierra Watershed Education Partnership (SWEP) on the Truckee High School Envirolution Club's 'Trashion Shows' when the District distributed over 1,800 conservation kits (native/drought tolerant seeds to promote saving water and energy in landscape irrigation) to every elementary and middle school student in the TDPUD's territory. The 'Trashion Shows' are a combination of science, art, and peer-to-peer education led by the Truckee High School Envirolution club. The students develop runway-quality costumes out of trash, each with a conservation or environmental message. 'Trashion Shows' were held at general assembly's at each elementary and middle school and the TDPUD's conservation kits were integrated into the show and then distributed, by the high school students, to the younger children at the end of each show. This partnership has been very cost-effective in delivering important energy and water savings measures to our customers. The benefits of the peer-to-peer education and leadership of the high school students are invaluable.

- Collaborated with the Town of Truckee, Nevada County, and other local public agencies to develop and deliver services and programs directly to a neighborhood. With a tag-line of 'Public Agencies Together….One Neighborhood at a Time', the concept was piloted in the Olympic Heights neighborhood of Truckee in 2010 with a block-party format where each local public agency brought their respective programs and services. For the TDPUD, this included handing out 7-types of CFL's for free and offering a free on-the-spot residential energy survey through the new RES Program. It is estimated that ~25% of the neighborhood residents attended the 4-hour event and the customer feedback on the event was overwhelmingly positive. Based on those solid results, the program was expanded in 2011 to include two middle-sized events: Prosser Lakeview and greater Sierra Meadows neighborhoods. In 2012 the event was held in the Glenshire Neighborhood (Truckee's largest 'full-time' resident neighborhood). The event has expanded to include over 10 local public agencies and the customer response remains very positive.
- Significant investments in community outreach, communications, and marketing are tapping increasing interest in energy efficiency programs. As an example, the TDPUD's annual LED (Light Emitting Diode) Holiday Light Program achieved ~5 percent customer participation over a 4-week period and all of the customers came to the TDPUD office where they were educated, provided with free CFL's, and given information on other energy efficiency opportunities.

2012 Commercial Customer Programs

- 'Keep Your Cool' Commercial Refrigeration Program: This direct-install program was developed by the Northern California Power Agency (NCPA) for their member utilities in 2009 and targets cost-effective commercial refrigeration measures (door gaskets, strip-curtains, and door closers). This program was oversubscribed in 2009 and the TDPUD increased funding in 2010 along with adding 4 additional measures (Programmable Electronically Commutated (EC) Motors, Evaporator Fan Controllers, Anti-Sweat Heater (ASH) Controls, and Vending Machine Controllers). This program was continued in 2011 with solid results and then expanded in 2012 to include LED Case Lighting and Floating Head Pressure Controllers. This program remains fully subscribed and cost-effective.
- Commercial LED Exit Sign Retrofit Program: This direct-install program was developed by the TDPUD to retrofit existing incandescent and fluorescent exit signs using a local contractor and high-efficiency LED exit sign retrofit kits. The combination of low retrofit cost and ease of installation created a very cost effective program.
- Commercial Energy Audits: TDPUD offers free on-site energy audits conducted by a TDPUD Energy Specialist for commercial customers that provide specific recommendations on cost-effective energy improvements to manage and reduce energy use and load.
- Commercial Energy Conservation Rebate Program: TDPUD provides a comprehensive commercial energy efficiency incentive program; focusing on peak load reduction and energy savings. Generous rebates and technical support are available to commercial customers to promote the installation of energy efficient measures (mostly commercial lighting projects). The emphasis this year was on promoting cost-effective commercial lighting retrofits, introducing LED lighting technology, and a 'Last Chance T12' commercial lighting rebate campaign.
- Solar PV Program: TDPUD offers financial incentives to commercial customers who incorporate solar PV technologies into their businesses (SB-1). This program is fully subscribed.

2012 Business Partnership Programs (Green Partners)

- This program is largely based on providing free screw/plug-in CFL and LED light bulbs to businesses to replace older, inefficient lighting.
- Retail: TDPUD encourage restaurants to install energy-efficient lighting and other energy efficiency measures. The District also works with and encourages local hardware and grocery stores to market and sell energy-efficient products.
- Restaurant: Encourage restaurants to install energy-efficient lighting, cooking, dishwashing, and heating, ventilation and air conditioning equipment.
- Hospitality: Encourage hotels, motels, and resorts to implement LEED design principles and energy-efficient lighting, controls, HVAC, water heating, pool/spa, restaurant, renewable energy and green building technologies.

2012 Residential Customer Programs

- Energy Saving Program (ESP): Continued an income qualified program targeting residential energy efficiency and weatherization measures (see 2012 Highlights above and Residential Energy Survey below).
- Residential Green Partners: This new program in 2009 was focused primarily on screw-in lighting with a goal to determine which types of lighting (beyond standard spiral 60-watt equivalent CFL's) are used most in our community and to provide free samples of this lighting for our customers. The TDPUD selected 7-types of CFL's for the program based on data from over 300 customers and over 3000 screw-in lamps (over 20 types ranging from floods to globes to flame tips to outdoor lamps to dimmables). The TDPUD continues to hand out for free, in addition to 12-packs of 60-watt equivalent CFL's, the following lights: 40-watt equivalent globes (G25's), 50-watt equivalent R20's, 65-watt equivalent floods (R30's), 65-watt equivalent dimmable floods (DR30's), 120-watt equivalent outdoor floods (PAR38's), and 100-watt equivalent spiral CFL's. This program is in addition to the rebate program that the TDPUD has for high-efficiency lighting.
- Portable/Take Home Energy Meters: Using the 'Kill-A-Watt' portable energy meters, this program allows customers to sign out a watt meter for a 2-week period to measure the energy use of their residential plug loads (from refrigerators to electronics). The TDPUD then helps the customer understand the data and identify cost-effective energy efficiency opportunities.
- Residential Energy Survey and Audits: TDPUD offers free on-site energy audits, conducted by a TDPUD Energy Specialist, that provide specific recommendations on cost-effective energy improvements to manage and reduce energy load and provide savings. Customers must participate in the TDPUD Residential Energy Survey Program (See 2012 Highlights above) and have high bills to participate in this program.
- Residential Energy Conservation Rebate Program: TDPUD provides a comprehensive residential energy efficiency incentive program, focusing on peak load reduction and energy savings. Generous rebates and technical support are available to residential customers to promote the installation of energy efficiency measures. This includes an appliance efficiency program for clothes washers, dishwashers and refrigerators; building efficiency program includes building envelope and forced-air distribution system leak testing and mitigation; residential CFL's efficiency program including a multi-family unit CFL light bulb give away; space heating system efficiency program includes ground source heat pumps and the water heating efficiency program includes the purchase of energy efficient electric water heaters.
- Solar PV Program: TDPUD offers financial incentives to residential customers who incorporate solar PV technologies into their homes (SB-1). This program is fully subscribed.

2012 Community Programs

- Energy Conservation & Efficiency Workshops: TDPUD staff offered numerous energy conservation and efficiency seminars and workshops in 2012.
- Million CFL Program: The Million CFL program is a 10-year program that was started in 2008 and designed to provide incentives and CFL give-a-ways that will result in significant lighting efficiency savings. All CFL give-a-ways are done face-to-face allowing for education of the customer and promotion of other programs.
- LED Holiday Light Swap Program: The District began an LED (light emitting diode) Holiday Light swap program in 2007. The program involves giving District customers up to three strands of LED holiday lights in exchange for their old inefficient holiday lighting. In 2012, this cost-effective program served ~5% of our customer base in a 4-week period. In additional, all of these customers visited our Conservation Department to participate in the program where the TDPUD educated them on the many other energy savings opportunities and handed out free CFL's.

2012 Education Programs - Public Schools & Community:

- Energy Education: TDPUD personnel give presentations on energy topics to local schools each year.
- 'Trashion Shows': Partnered with the Truckee Tahoe Unified School District (TTUSD) and the Sierra Watershed Education Partnership (SWEP) on the Truckee High School Envirolution Club's 'Trashion Shows' when the District distributed over 1,800 conservation kits (native/drought tolerant seeds to promote saving water and energy in landscape irrigation) to every elementary and middle school student in the TDPUD's territory. The 'Trashion Shows' are a combination of science, art, and peer-to-peer education led by the Truckee High School Envirolution club (See 2012 highlights). The benefits of the peer-to-peer education and leadership of the high school students was invaluable.
- Green Building Symposium: TDPUD helps organize and conducts a presentation at the Truckee Home Show's annual Green Building Symposium.

2012 TDPUD Website

The TDPUD continues to improve our website and conservation/energy efficiency pages that are an on-line resources to our customers regarding programs, rebates, application information, and local resources. A new TDPUD website and on-line rebates/conservation database system was worked on in 2012 and will launch early in 2013.

2012 TDPUD Demand Reduction Programs

The TDPUD does not currently have any demand reduction programs in place since there is very little air conditioning load and the TDPUD high demand time is winter, weekends, and holidays. However, many of our energy efficiency programs address our unique load profile.

2012 TDPUD Water Conservation Programs:

The TDPUD serves both water and electric power services to our customers. In fact, the TDPUD's largest electric customer is the TDPUD Water Department and we fully understand the links between water conservation and energy savings for both ourselves and our customers. Current water conservation programs include:

- TDPUD Water Wise Demonstration Garden: TDPUD began installing residential water meters in 2009 and began billing water by usage in 2011. For many customers, water usage is driven by landscaping and irrigation. To help our customers manage their irrigation use, TDPUD developed a water wise demonstration garden at our main headquarters to educate our customers on techniques to maintain beautiful landscaping and save water. The garden includes almost 100 native and drought tolerant plants along with replacing our traditional lawn with a variety of native grasses that can use 2/3 less water.
- Commercial Water Conservation Rebate Program: TDPUD offers rebates to commercial customers for the installation of water-saving measures including water-efficient clothes washers, low-flush toilets; waterless urinals and other water saving devices.
- Residential Water Conservation Rebate Program: TDPUD offers financial rebates to residential customers for the installation of water-saving measures including rebates for water-efficient toilets and for repairing customer water leaks. TDPUD also provides at no cost low-flow showerheads, faucet aerators, and hose nozzles.
- Landscape Water Conservation Workshops: TDPUD partnered with local nurseries to conduct landscape water conservation workshops for the community.

Truckee Donner – Summary of Energy Efficiency Programs

Truckee Donner		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	190	23	23	26,523	318,278	176	$19,000	$4,712	$23,712
HVAC	Res Cooling									
Appliances	Res Dishwashers	167	12	12	7,412	81,527	45	$16,700	$1,115	$17,815
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	39,480	1,597	624	1,732,770	15,693,085	8,377	$148,229	$153,856	$302,085
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	345	33	33	157,077	948,705	515	$32,916	$9,750	$42,666
HVAC	Res Shell	38	1	1	1,158	20,838	13	$6,000	$1,848	$7,848
Water Heating	Res Water Heating	5,751	1,743	1,743	17,591	176,671	95	$17,509	$15,096	$32,605
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling									
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	2,617	120	120	506,212	5,333,941	2,956	$200,579	$62,300	$262,879
Process	Non-Res Motors									
Process	Non-Res Pumps	623	71	71	188,371	2,658,907	1,479	$84,806	$38,445	$123,251
Refrigeration	Non-Res Refrigeration	5	8	8	97,649	781,196	412	$50,669	$7,780	$58,449
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		49,216	3,609	2,635	2,734,763	26,013,147	14,067	$576,408	$294,901	$871,309
T&D	T&D									
Total		49,216	3,609	2,635	2,734,763	26,013,147	14,067	$576,408	$294,901	$871,309

EE Program Portfolio TRC Test	**2.38**

TURLOCK IRRIGATION DISTRICT

Turlock Overview

- 99,911 customers
- 72% are residential
- Peak demand 516 MW (2012 Summer Peak)
- 2012 energy use: 1,956 gigawatt-hours

Established in 1887, the Turlock Irrigation District (TID) was the first publicly owned irrigation district in the state and is one of only four in California today that also provides electric retail energy directly to homes, farms and businesses. Organized under the Wright Act, the District operates under the provisions of the California Water Code as a special district. TID is also an independent control area and is governed by a five member board of Directors. Since 1923, TID has been providing safe, affordable and reliable electricity to a growing retail customer base that now numbers in the excess of 99,000 residential, farm, commercial, industrial and municipal accounts in an electric service area that encompasses 662 square-miles in portions of Stanislaus, Merced, Tuolumne and Mariposa counties.

TID provides Irrigation water to more than 5,800 growers in a 307 square-mile service area that incorporates 149,500 acres of Central Valley farmland. The District has been delivering irrigation water to growers since completing its gravity-fed water conveyance system of canals and laterals in 1900.

TID Energy Efficiency Program Highlights

The TID Board of Directors adopted an aggressive 10-year plan to promote energy conservation by assisting customers with efficiency projects. For 2012, the goal was to conserve 12,644 megawatt-hours of electricity.

TID continues to help customers achieve energy savings through the implementation and promotion of a variety of programs that provide rebate opportunities for all rate classes to encourage customers to conserve energy. A significant portion of the energy efficiency measures were implemented by industrial and commercial customers. 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.

Current TID Energy Efficiency Programs

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. Vending/Cooling Misers for Commercial Customers: TID had contracted a vendor to install vending miser/cooler misers for customers with refrigerated vending machines and/or glass front coolers. Additionally, the program will install spray valves, aerators and showerheads for customers who have electric water heating.

Residential Customer Programs

- 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
- Shade Tree Rebate: TID provides rebates for up to 3 trees per year that are planted to provide shade.
- Refrigerator Recycling: TID will pay customers to dispose of an old refrigerator or freezer and TID's contracted recycler will pick up and recycle the unit for free.
- CFL Rebate Program: TID provides a rebate for the purchase and installation of CFLs.
- New Construction Rebate: TID offers a rebate to home builders for exceeding Title 24 energy standards.
- Solar Attic Fan: TID provides a rebate to customers who purchase and install a new solar attic fan

Time Period for Reporting Data: Calendar Year ending 12/31/12

Proposed New Energy Efficiency Programs

Non-Residential Customers

- TID will contract with a vendor to install CFL's and LED "Open" signs to selected customers, and in return will do an energy audit of the facility. This will enable TID to acquire information about our customer needs and to be able to create future programs that are beneficial

Residential Customers

- TID will hold (2) one day event to distribute approximately 600 shade trees and planting kits at a discounted rate. This event will promote energy efficiency to homeowners in our district. TID also will be educating our customers on proper planting of the shade trees to ensure the success of program.

Modifications to Existing Energy Efficiency Programs

- All programs are evaluated annually to ensure they meet program objectives.

Assistance Programs

- 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 $11 to $2, a savings $9, 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.

Demand Reduction Program

While TID does not have a formal program in place, a communication structure exists with large customers to meet demand reduction needs as necessary.

Renewable Energy Program Highlights

- Tuolumne Wind Project: TID invested in a 136.6 megawatt wind facility in 2008
- Fuel Cell Project: TID installed the largest fuel cell in California partnering with the City of Turlock's Regional Water Quality Control Facility.
- Solar: TID offers solar rebates for customers that are interested.
- 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.

Research, Development & Demonstration

While TID did not perform any research and development projects in 2012, TID is continually looking for opportunities to develop new methods for improving energy efficiency and renewable opportunities.

Turlock – Summary of Energy Efficiency Programs, FY2012

Turlock ID		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	593	6	6	13,758	137,576	76	$20,755	$654	$21,409
HVAC	Res Cooling	210	9	11	25,342	661,371	421	$8,942	$4,626	$13,568
Appliances	Res Dishwashers									
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	879	22	3	16,882	84,410	45	$730	$320	$1,050
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	612	41	41	152,022	1,155,506	627	$37,190	$5,448	$42,638
HVAC	Res Shell	60	14	14	14,292	150,480	85	$9,640	$747	$10,387
Water Heating	Res Water Heating									
Comprehensive	Res Comprehensive									
Process	Non-Res Cooking									
HVAC	Non-Res Cooling	252			289,258	1,157,034	610	$57,244	$4,097	$61,341
HVAC	Non-Res Heating									
Lighting	Non-Res Lighting	44	558	558	2,954,966	32,504,622	17,575	$213,807	$157,125	$370,932
Process	Non-Res Motors	10	66	66	383,966	5,759,496	3,071	$24,049	$30,767	$54,816
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	1	7	7	100,243	400,973	222	$6,265	$1,478	$7,743
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive	1	409	409	898,981	9,888,790	5,480	$56,186	$48,570	$104,756
Water Heating	Other	55			27,172	207,334	109	$2,072	$906	$2,978
SubTotal		2,717	1,132	1,115	4,876,881	52,107,590	28,322	$436,881	$254,739	$691,620
T&D	T&D									
Total		2,717	1,132	1,115	4,876,881	52,107,590	28,322	$436,881	$254,739	$691,620
			0							
EE Program Portfolio TRC Test		**1.26**								

UKIAH PUBLIC UTILITY

Ukiah Overview

- The City of Ukiah Electric Utility, established in 1897, is Mendocino County's only customer-owned electric utility.
- The City of Ukiah supplies electricity to approximately 16,000 plus residences and businesses.
- Peak demand: 36 megawatts – July 2006
- Annual energy use: 115,000 megawatt-hours
- Power content (2010): Geothermal 39.9 percent, small hydro 11.9 percent, large hydro 17.5 percent 30.8 percent Unspecified. [51.7 percent eligible renewable]
- Renewable generation from hydropower and Geothermal provide 69.2 percent of Ukiah's power needs.

Ukiah Energy Efficiency Program Overview

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, 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.

Residential Programs:

- Energy Efficiency Hotline: A toll free line with city personnel is available for our customers to answer questions and provide information on energy efficiency related matters.
- Energy Audits: On-site energy audits by city energy specialists are available to residential customers. Energy efficiency measures are recommended based on each audit and the city personnel follow up with additional visits to answer questions and make additional recommendations, if requested.
- Appliance Rebates: The city provides rebates for the purchase of several ENERGY STAR® Qualified 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 or air-conditioners that exceed current state efficiency requirements
- Residential Lighting Rebates: The city offers rebates to homeowners who install ENERGY STAR Qualified compact florescent lamps (CFLs) and LED holiday lights.
- Weatherization Rebates: The city offers rebates to homeowners who invest in weatherization upgrades, including insulation and windows.

Commercial and Industrial 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. Rebates are available for energy efficiency upgrades identified in these audits.

- Commercial Lighting: This program engages local lighting and electrical contractors to promote and install energy efficient lighting upgrades using technical assistance and financial incentives available from the city.
- Keep Your Cool: This offer provides a free, no obligation check of commercial refrigeration equipment. Castrovilla, the Keep Your Cool (KYC) contractor, examines the condition of fan motors, controls, case lighting, door gaskets, strip curtains and door closers. If Castrovilla finds that the current equipment is in need of replacement or upgrading, recommendations are made to customers to have the appropriate equipment installed. Most measures are installed at no cost to the customer, while other measures may require customer co-pay.

Public Facilities and Schools:

- Energy Audits: Complementary on-site energy audits as requested for all public facilities. Energy efficiency recommendations and audit follow up visits support implementation of recommended energy efficiency measures. Rebates are available for energy efficiency upgrades identified in these audits.

Performance Results for FY2012

For FY2011-FY2013, Ukiah's City Council adopted energy savings targets that increased our EE goals by 30%. Despite a slight decrease in residential rebate activity and commercial lighting activity, as well as an increased energy savings target, the city still substantially exceeded their FY2012 EE goal.

The City of Ukiah's AB 2021 energy savings target for FY2012 was 250,000 kWh. In FY2012, the city exceeded their annual goal by 221%, with a total net energy reduction of 802,099 kWh.
The City of Ukiah's AB 2021 Demand Reduction Target for FY2012 was 68 kW. In FY2012, the city surpassed their annual goal, with a total net demand reduction of 150 kW.
The largest contributor to FY2012 energy savings was the Keep Your Cool program which yielded 495,745 net annual kWh from refrigeration retrofits at 32 businesses. The second largest contributor to FY2012 energy savings was the commercial lighting program which yielded 296,825 net annual kWh from retrofits at 15 businesses.

The City of Ukiah's EE Program had a Total Resource Cost (TRC) of 3.08 in FY2012.
In comparison to FY2011, the city reported 293,702 kWh less (-27%) at a cost of $340,067 less (-57%). The major factor which caused the decrease in savings was reduced activity in the commercial lighting program; 58 retrofits were completed in FY2011 in comparison to just 15 in FY2012. The Keep Your Cool program made up for a vast majority of the lost savings; however, the overall reduction in the commercial sector was still 291,555 kWh.
In FY2012, public benefit funding was spent as follows:

Category	***Amount***	***%***
Low Income	$266,000	27%
Energy Efficiency	$350,000	35%
Renewables	$150,000	15%
RD&D	$35,000	3%
Misc/Labor	$199,181	20%
Total	***$1,000,181***	***100%***

FY2013 Forecast
The City of Ukiah is forecasting that it will meet or exceed their AB 2021 energy savings and demand reduction targets for FY2013 (which are greater than FY2011/FY2012). The city anticipates that commercial lighting and a low-income residential direct install program will deliver the vast majority of the energy savings.

The city's EE rebates were revised for FY2011-FY2013 based on the Measure Quantification Report issued by KEMA in December, 2009. The FY2011-FY2013 EE program reflects a comprehensive suite of measures which are cost-effective based on the rebate level offered and the quantified savings in the KEMA report. The city's forecast indicates that the FY2013 AB 2021 target of 310,000 kWh can be met with a funding level of $140,000 for rebates and administration. Unlike previous years, the city does not anticipate the ability to significantly exceed the FY2013 target (or future targets). Previous year achievements can be attributed to a surplus in public benefit funds; this surplus will no longer be available for energy efficiency programs and services going forward.

Evaluation, Measurement and Verification
Utilities have the option of performing EM&V reports annually, or once every three years. Ukiah is planning to perform an EM&V report for FY2011-FY2013.

ARRA Activity
In FY12, Ukiah installed the LED street lights that were approved as part of the Energy Efficiency Conservation Block Grant from the California Energy Commission (CEC) under the federal stimulus - ARRA program. The proposal received CEC approval in the fall of 2010.

The demonstration project replaced 134 high pressure sodium street light at 250 watts each (actual wattage draw is 298 watts per fixture). They were replaced with 148 watt, Copper 5 bar LED fixtures. The annual savings estimate to the City from this project is 88,038 kWh's, with a kW reduction of 20.1.

Ukiah – Summary of Energy Efficiency Programs, FY2012

Ukiah		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	3	3	3	1,201	14,413	8	$225	$1,918	$2,143
HVAC	Res Cooling	35	5	7	1,533	25,857	16	$3,217	$4,150	$7,367
Appliances	Res Dishwashers	1			53	581		$60	$77	$137
Consumer Electronics	Res Electronics									
HVAC	Res Heating									
Lighting	Res Lighting	14			403	2,135	1	$35	$436	$471
Pool Pump	Res Pool Pump									
Refrigeration	Res Refrigeration	13			1,770	24,782	13	$975	$3,032	$4,007
HVAC	Res Shell	32	7	7	4,569	90,997	56	$9,278	$10,443	$19,721
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	72	72	296,825	6,530,152	3,619	$49,985	$19,620	$69,605
Process	Non-Res Motors									
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration	1	62	62	495,745	2,974,470	1,568	$120,459	$29,211	$149,671
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		100	150	152	802,099	9,663,386	5,282	$184,234	$68,888	$253,122
T&D	T&D									
Total		100	150	152	802,099	9,663,386	5,282	$184,234	$68,888	$253,122

EE Program Portfolio TRC Test	**3.08**

CITY OF VERNON LIGHT & POWER

Vernon Overview

- Established in 1905, the City of Vernon began serving electric customers in 1933.
- Vernon is part of the California Independent System Operator Control Area and is a Participating Transmission Owner.
- Vernon's customer base is comprised primarily of industrial and commercial interests.
- During the fiscal year ending 2011/12, the electric system served approximately 1,896 customers, supplied approximately 1,145,129 Megawatt hours, and had a peak demand of over 190 megawatts.

City of Vernon Energy Efficiency Program Objectives

- 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.

Overview of City of Vernon Energy Efficiency Programs:

Customer Facilities

- During the 2011/12 fiscal year one of the top customers in the City of Vernon recently completed installing LED fixtures all throughout their Cold Storage facilities which had a major impact on their energy reduction. Since this project was so successful other cold storage facilities have taken notice and are eager to implement their own projects. This particular project has had an enormous impact on this year energy savings. The City continues to support and encourage these type of projects. That means more energy savings for our customers and for the City of Vernon.

Current Commercial Customer Programs:

- 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.

Proposed Energy Efficiency Programs and Services: (for FY 2012-2013)

- Maintain existing programs.
- Ensure that all new electric load is efficient.
- Evaluate the appropriateness of any new energy efficiency technologies.
- Ensure that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency measures.
- Measure and evaluate the impact of energy efficiency programs.
- Educate all existing customers on time-of use rate to utilize shifting load to off & mid peak hours.

Renewable Energy Program

Solar Incentive Program: Solar Rebate Program provides performance-based incentives of $2.09 per installed watt. The City of Vernon will have two customers online for the new 2012/13 fiscal year one an 22 KW and 33 KW systems..

Evaluation, Measurement & Verification

The City of Vernon will provide transparency in the documentation of its energy efficiency programs once new guidelines set by the CEC are in place.

Vernon Demand Reduction Programs:

- Interruptible Service Program**:** Reduce demand load in case of system emergencies. Can reduce over 12.65MW within 30 minutes.

Investment in Renewable Energy

The City of Vernon continues to explore renewable energy to meets its renewable portfolio by purchasing land in the Tehachapi Mountain in Kern County with the intent to develop a wind farm. The City of Vernon invested over 26 million on this project. This project continues to move forward but is currently going through the permit stages.

Vernon – Summary of Energy Efficiency Programs, FY2012

Vernon		Resource Savings Summary						Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Net Demand Savings (kW)	Net Peak kW Savings	Net Annual kWh Savings	Net Lifecycle kWh savings	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
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	2,473	624	624	3,248,470	51,110,741	30,272	$317,623	$54,220	$371,843
Process	Non-Res Motors	1		2	14,397	57,588	32	$3,119	$49	$3,168
Process	Non-Res Pumps									
Refrigeration	Non-Res Refrigeration									
HVAC	Non-Res Shell									
Process	Non Res Process									
Comprehensive	Non Res Comprehensive									
Other	Other									
SubTotal		2,474	624	626	3,262,867	51,168,329	30,304	$320,742	$54,269	$375,011
T&D	T&D									
Total		2,474	624	626	3,262,867	51,168,329	30,304	$320,742	$54,269	$375,011

EE Program Portfolio	TRC Test	**9.10**
	PAC Test	**14.52**

VICTORVILLE MUNICIPAL UTILITY SERVICES

Victorville Overview

- The City of Victorville established the Victorville Municipal Utility Services (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.
- All customers' facilities are nine years old or less, occupying buildings that meet Title 24 requirements. This results in lower energy efficiency potential.
- VMUS receives wholesale power through its 33 kV and 12 kV switchgear equipment.
- VMUS serves approximately 50 non-residential meters.
- Peak demand for the utility was 14.1 megawatts and annual energy sales were 77,500 megawatt-hours.

Victorville Energy Efficiency Program Highlights

Goals

- Design and install distribution facilities that reduce system losses.
- Provide information and analysis to VMUS customers to increase awareness of energy efficiency and facilitate informed decisions about reducing energy consumption and load requirements.
- Prioritize energy efficiency technologies and opportunities.
- Provide financial assistance to qualified customers to implement cost-effective and approved energy efficiencies.
- Measure and evaluate the impact of energy efficiency programs.
- Ensure that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency improvements.

System Design

- 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.

Programs

- Time-of Use Rates Program: All customers receive time-of-use pricing bills; enabling them to reduce their energy costs and system demand through the time management of their energy usage.
- Web Portal: Provides customers with timely information of energy usage and demand to more efficiently manage their electric consumption.
- Photovoltaic Incentive Program: Provides financial incentives of $2.09 per watt up to $15,000 per customer not to exceed 50% of the total installed cost of a new solar energy system.
- Lighting Incentives: Provides incentives to improve energy efficiency for a variety of lighting applications, which reduce energy usage by a specified amount.

- Energy Audits: On-site energy audit and recommendation designed to improve energy operating efficiency and reduce load requirements.
- Custom Energy Efficiency Incentives: Offers financial incentives for cost-effective energy-savings opportunities, not served by existing offerings, which reduce energy usage or load requirements by a specified amount.

VMUS Demand Reduction Programs:

- Municipal Facilities: VMUS serves municipal facilities that can be interrupted as scheduled.

APPENDIX B: LIST OF AVAILABLE EM&V REPORTS

The evaluation, measurement and verification (EM&V) reports listed below are available (unless otherwise noted) for download at: http://www.ncpa.com/current-issues/energy-efficiency-em-v-reports.html:

Alameda
01/12 - 2010-2011 Energy Efficiency Evaluation Report
09/10 - 2009 Residential CFL Impact Evaluation
06/08 - 2008 Program Evaluation Report

Azusa
06/11 - 2011 Evaluation, Verification, and Measurement Study

Biggs
2010 - Evaluation, Verification, and Measurement Study
2009 - Evaluation, Verification, and Measurement Study
02/10 - 2008 Energy Efficiency Program Evaluation
06/08 - 2008 Energy Efficiency Program Evaluation Plan

Banning
2010 - Evaluation, Measurement, and Verification Study

Burbank
07/10 - 2009 EM&V Study by Lincus 2010

Gridley
03/10 - 2009 Evaluation Measurement & Verification Report
06/08 - 2008 Energy Efficiency Program Evaluation Plan

Healdsburg
05/10 - 2009 Evaluation, Measurement and Verification Study
06/08 - 2008 Energy Efficiency Program Evaluation Plan

Imperial irrigation district
2009 - 04/11 Evaluation, Measurement, and Verification Study

LADWP
01/11 - 2008-2009 Evaluation, Measurement, and Verification Study
10/09 - 2007-2008 Evaluation, Measurement, and Verification Study
08/08 - Measurement and Verification of Energy Efficiency Program FY06/07

Lassen
06/08 - 2008 Energy Efficiency Program Evaluation Plan
03/10 - 2009 Evaluation, Measurement, and Verification Study

Lodi
12/12 - 2011-2012 Energy Efficiency Program Evaluation Report
11/11 - 2010-2011 Energy Efficiency Evaluation Study
2009-2010 - Evaluation, Verification, and Measurement Study
11/09 - Impact Evaluation of the Non-Residential Custom Program
Residential Custom Program Lighting and Appliance Rebate
11/08 - Process Evaluation of Lodi Electric's Efficiency Program and Impact Evaluation of the Non-
05/08 - 2008 Energy Efficiency Program Evaluation Plan

Lompoc
12/11 - 2010/2011 Energy Efficiency Evaluation Report
01/11 - 2010 Evaluation, Measurement & Verification Study
06/08 - 2008 Energy Efficiency Program Evaluation Plan
03/09 - 2008 Program Evaluation Report

Merced
12/09 - 2008 Evaluation, Verification, Measurement Study

Modesto
08/12 - Evaluation, Measurement, and Verification Report
11/10 - 2009 Evaluation, Verification, and Measurement Study
04/09 - 2008 Program Evaluation Plan

Palo Alto
03/12 - 2011 Evaluation of the Home Energy Report Program
03/12 - 2011 Evaluation of the Commercial Advantage and Enovity Programs DRAFT
02/12 - Evaluation of Washing Machine SMART Rebate Program
02/09 - Evaluation, Verification, and Measurement Study
03/10 - 2009 Energy Efficiency Program Evaluation Plan
03/11 - 2010 Evaluation, Verification, and Measurement Study

Pasadena
2011 CCSE Summary of PWP Commercial EE Review
10/09 - 2009 Evaluation, Verification and Measurement Study

Plumas Sierra REC
02/10 - Evaluation, Verification, and Measurement Study
02/10 - 2009 Engineering Evaluation of GeoExchange Program
02/10 - 2009 Evaluation, Verification, Measurement Study: GeoExchange
05/08 - 2008 Energy Efficiency Program Evaluation Plan

Port of Oakland
02/09 - 2007-2008 Energy Efficiency Program

Redding
07/09 - Evaluation, Verification, and Measurement Study
03/09 - 2008 Program Evaluation Report
06/08 - 2008 Energy Efficiency Program Evaluation Plan
Riverside
11/10 - Review of Non-residential Program Application
03/10 - Evaluation, Measurement, and Verification Study

Roseville
05/12 - Evaluation, Measurement, and Verification Study
09/11 - Evaluation, Measurement, and Verification - Shade Tree Program
06/10 - 2009 Report: Small Commercial Lighting, Commercial/Industrial Hi-Bay Lighting, Living Wise Program
02/09 - Process and Impact Evaluation of Roseville Electric's Residential
New Construction, HVAC Retrofit, and Commercial Custom Rebate Programs: FY2007/08
12/08 - 2008 Energy Efficiency Program Evaluation Plan

Silicon Valley Power
03/13 - 2011-2012 Evaluation, Measurement, and Verification Study
01/12 - 2010-2011 Evaluation, Measurement, and Verification Study
03/11 - 2010 Evaluation, Measurement, and Verification Study
12/09 - Evaluation, Verification, and Measurement Study
03/09 - 2008 Program Evaluation Report
08/08 - 2008 Energy Efficiency Program Evaluation Plan

Shasta Lake
12/12 - 2010-2011 Evaluation, Measurements, and Verification Study
2009 - Evaluation, Verification, and Measurement Study

SMUD
09/09 - The Impact of Home Electricity Evaluation Reports
11/07 - Evaluation of Prescriptive Lighting Program 03/08 - Residential HVAC Program Evaluation
05/07 - Measure and Verify Savings of Refrigerator Recycling Program

Turlock Irrigation District
07/10 - 2009 Program Evaluation Report
03/09 - 2008 Program Evaluation Report
05/08 - 2008 Energy Efficiency Program Evaluation Plan

Truckee Donner
04/12 - Evaluation, Measurement, and Verification Report
03/11 - 2010 Evaluation, Measurement, and Verification Study
05/10 - Evaluation Measurement, and Verification Study
02/09 Evaluation, Measurement, and Verification Plan for TDPUD: 2008 Energy Efficiency Programs
06/08 - 2008 Energy Efficiency Program Evaluation Plan

APPENDIX C: BACKGROUND ON THE EERAM

This appendix contains an in-depth description of the assumptions and factors that are built into the EERAM tool used by POUs in developing updated 10-year energy efficiency targets. The contents of this appendix were prepared by Navigant.

Model Methodology

Introduction

The Energy Efficiency Resource Assessment Model (EERAM) is an energy efficiency potential model designed to estimate technical, economic, and market energy efficiency potential for a utility's service area. Developed by Navigant, the model forecasts energy savings and demand reduction potential within the residential, commercial, and industrial sectors over a forecast period of typically 20 years. Since its inauguration in 2007, the model has been used by over 50 different electric and natural gas utilities across the country to identify future energy conservation potential.

EERAM is an Excel spreadsheet model based on the integration of energy efficiency measure impacts and costs, utility customer characteristics, utility load forecasts, and utility avoided costs and rate schedules. Excel is used as the modeling platform to provide transparency to the estimation process. Using Excel also allows the model in be customized to each client's unique characteristics and accommodate either detailed or more general model input data.

The model utilizes a "bottoms-up" approach, using the starting points of study area building stocks and equipment saturation estimates, forecasts of building stock decay and new construction, energy efficiency technology data, past energy efficiency program accomplishments, and decision maker variables that help drive the market scenarios. For existing energy efficiency measures, EERAM calculates market potential based on a decision maker adoption rate algorithm. This algorithm is primarily a measure by measure elasticity response to measure payback. However, a diffusion curve methodology is used for emerging technologies. Emerging technologies are considered to follow a Bass diffusion curve methodology rather than a measure payback methodology. The Bass diffusion model was developed by Frank Bass and describes the process of how new products are adopted as an interaction between users and potential users.

The model incorporates a number of innovative features. These include:

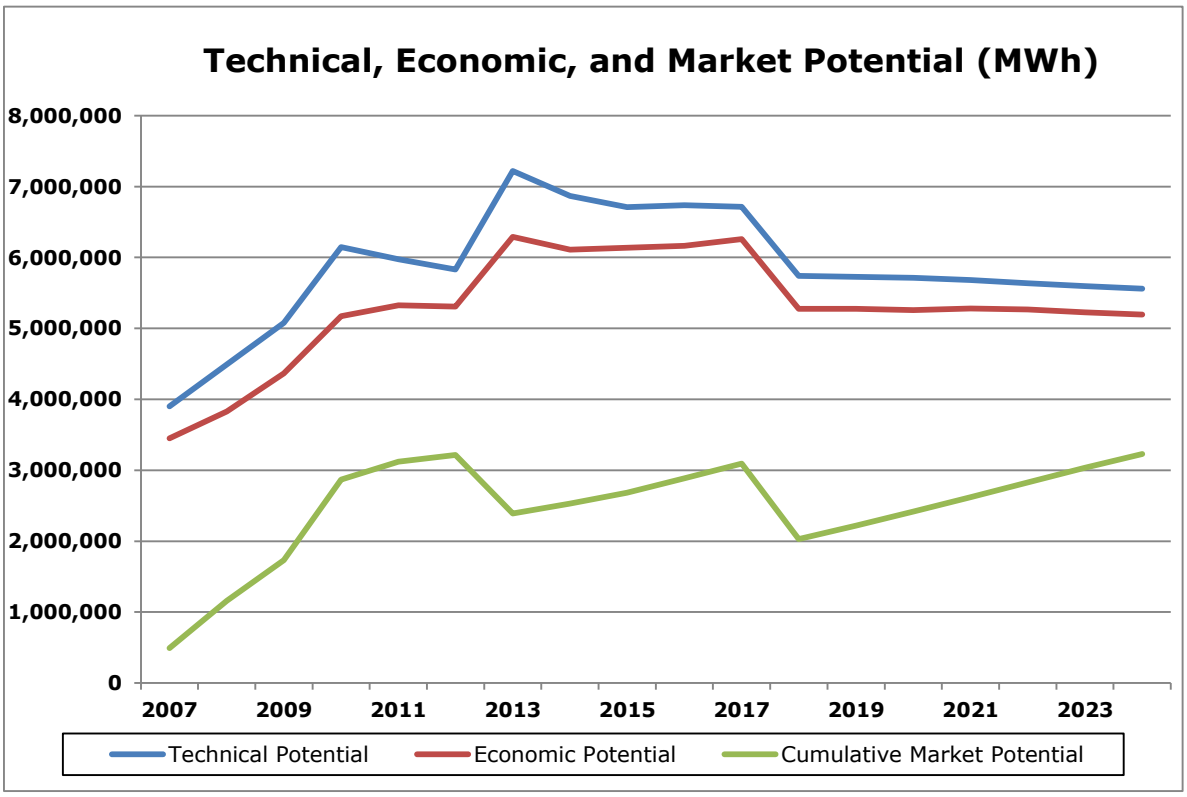
- Utilization and wherever possible, direct linkage to statewide or utility specific deemed energy savings and cost databases.
- Utilization of utility specific or, if not available, regionally specific building characteristics information. These data often come from on-site or telephone based building surveys of building and appliance stocks. The model is able to include as many different building segments and industrial classifications as there is data available.
- Utilization of decision maker awareness of measures and if aware, the willingness to purchase the energy conservation measure variables. These variables are utilized in the consumer choice algorithm. This data is most often collected at the same time as the building and appliance stock characteristics are gathered through a special decision maker survey.
- Utilization of historical utility specific energy conservation achievements to calibrate model results.
- The ability to create forecasts utilizing either the historical achievement data for calibration or utilizing percent of sales by sector as the first year calibration method.

- The ability to quickly create scenarios based on different measure incentive levels. Other scenarios can also be developed using alternative input data, such as avoided costs, energy forecasts, building stock forecasts, and others that may be of interest to the utility.
- The ability to include a number of different avoided costs streams pegged to specific end-uses.
- The model not only calculates the basic economic tests (described later) but also calculate the Total Resource Cost (TRC) test for the base year and for each year in the forecast. The TRC value is used to screen what is included in the market potential estimates and as technology costs and impacts change over time, so do the TRC values.
    - The TRC screening value is a variable set by the user
    - For emerging technologies, the TRC screen is allowed to be lower, if desired by the user.
- In addition to the TRC values changing over time, the model incorporates time vectors for other key variables as well including:
    - Technology cost
    - Administrative cost.
    - Technology impact
    - Consumer awareness and willingness
    - Avoided costs
- Impacts of known Codes and Standards and the timing of those impacts are included in the modeling structure. These impacts are estimated at the measure level
- The ability to include the interactive effects on other fuel usage (such as natural gas) when electric measures are implemented.
- Recognition that at the end of measure life, actions may take place that affects both cumulative potential and program participation.
    - The model has a variable called "measure re-engagement", which is a percentage estimate of those who continue with the same or more efficient version of the initially implemented measure. The remainder is assumed to fall back to the baseline efficiency. The model adjusts cumulative potential to account for those who fall back to the baseline efficiency.
    - The model has another variable called "re-participants". This is an estimated percentage of the "measure re-engagers" who also again participate in the utility program and receive an incentive. For these customers, their energy savings is assumed to continue but is not counted as new incremental savings. Although there is no new incremental savings, there is a cost associated with maintaining these savings. The additional incentive and administrative costs are added to the program costs.
- Mutually exclusive measures are placed into competition groups. Within the competition groups, the share of the baseline technology that potentially could be affected by the mutually exclusive competing efficient technologies is split based on the TRC values of these competing technologies. For example, if one mutually exclusive technology has a TRC of 1.0 and the other a TRC of 3.0, the applicability factor (share of the base technology) for the first measure is 25% and for the second 75%. This applicability is re-calculated each forecast year as it is likely TRC values change over time with the resulting applicability factors also changing over time.

Types of Potential Estimated

The model partitions its evaluation of each measure into technical, economic and market potential. Each assessment includes building stock estimates (sales in the industrial sector), technology densities, and measure impacts, each using a different algorithm. Figure 1 illustrates sample results for each type of energy efficiency potential.

Figure 1: Sample Graph of Technical, Economic, and Market Potential



Technical potential is calculated using the product of a measure's savings per unit, the quantity of applicable units in each facility (in the case of industrial, the number of units per kWh of sales), and the number of facilities in a utility service's area. The assessment includes measures that might not be cost-effective or have the backing of a strong consumer market. By disregarding these factors, the technical potential assessment provides an upper bound of efficiency potential regardless of cost or market penetration. For measures considered to be replace on burnout(ROB), the quantity of applicable units per year is limited to the number that need to be replaced, which is determined by measure life. As time passes, this potential population grows until meeting the full measure life. For other, non-replace on burnout measures, the full populations of baseline units are considered available. No net-to-gross adjustments occur with technical potential.

Economic potential estimates the amount of technical potential that is "cost-effective," as defined by the results of the Total Resource Cost (TRC) test. The TRC test is a cost-benefit analysis of relevant energy efficiency measures, excluding market barriers such as lack of consumer knowledge. Benefits include avoided costs of generation, transmission and distribution investments, as well as avoided fuel costs due to energy conserved by energy efficiency programs. Costs include incremental measure costs and programs' administration costs. The TRC screening value for emerging technologies can be set lower than other technologies if the user wishes it to be. Replace on burnout measures are treated the same as with technical potential and there are no net-to-gross adjustments.

Market potential is the third of EERAM's energy efficiency algorithms, calculating the amount of economic energy efficiency potential that could be captured by utility programs over the forecast period. This calculation varies with the program's parameters, such as the program design or magnitude of incentives or rebates for customer installations. EERAM recognizes six types of program designs, including:

- Replacement on Burnout (ROB): An energy efficiency measure is implemented after the existing equipment fails.

- Early Retirement (Early): An energy efficiency measure normally regarded as ROB is installed before its effective measure life is reached.
- Retrofit (RET): An energy efficiency measure that can be implemented immediately. The lifetime of the base technology is not a factor as RET measures generally do not replace existing technologies, but rather improve the efficiency of existing technologies. The energy impact is therefore the amount of that improvement.
- Emerging Technology (Emerge): An energy efficiency measure is just entering or about to enter the marketplace. Market potential is calculated differently for Emerging Techs, using a Bass diffusion model[1] rather than the traditional measure payback.
- Behavioral Programs (Behavior): These are programs that are designed to influence consumer behavior through the provision of training and/or information. As with emerging technologies, market potential is calculated using a Bass diffusion model[1] rather than the traditional measure payback.
- New Construction (New): A measure or package of measures is installed at the time of new construction.

EERAM also calculates several financial tests, including:

- Total Resource Cost (TRC): Mentioned earlier, this test includes all quantifiable costs and benefits of an energy efficiency measure, regardless of who accrues them.
- Utility Cost Test (UCT): This test measures the net costs of an energy efficiency program based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant.
- Ratepayer Impact Test (RIM): This test measures what happens to customer bills or rates due to changes in utility revenue and operating costs caused by the program.
- Participant Cost Test (PCT): This test measures the quantifiable benefits and costs to the customer due to participation in the program.
- Simple Customer Payback: This measurement calculates the program payback by taking the measure cost less the incentive received and divides it by first year energy bill savings.
- Levelized Measure Cost/kWh: This measure multiplies the energy efficiency measure costs by the Capital Recovery Factor[2], and divides by the first year kWh savings.

Model Flow

Figure **2** provides an outline of the various inputs to the EERAM model and connections to the calculation portions of the model. Outputs from the model are designed to accomplish multiple objectives, including:

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[1] The Bass diffusion model calculates the interaction between a product/measure's users and potential users in order to understand the adoption rates of these new products.

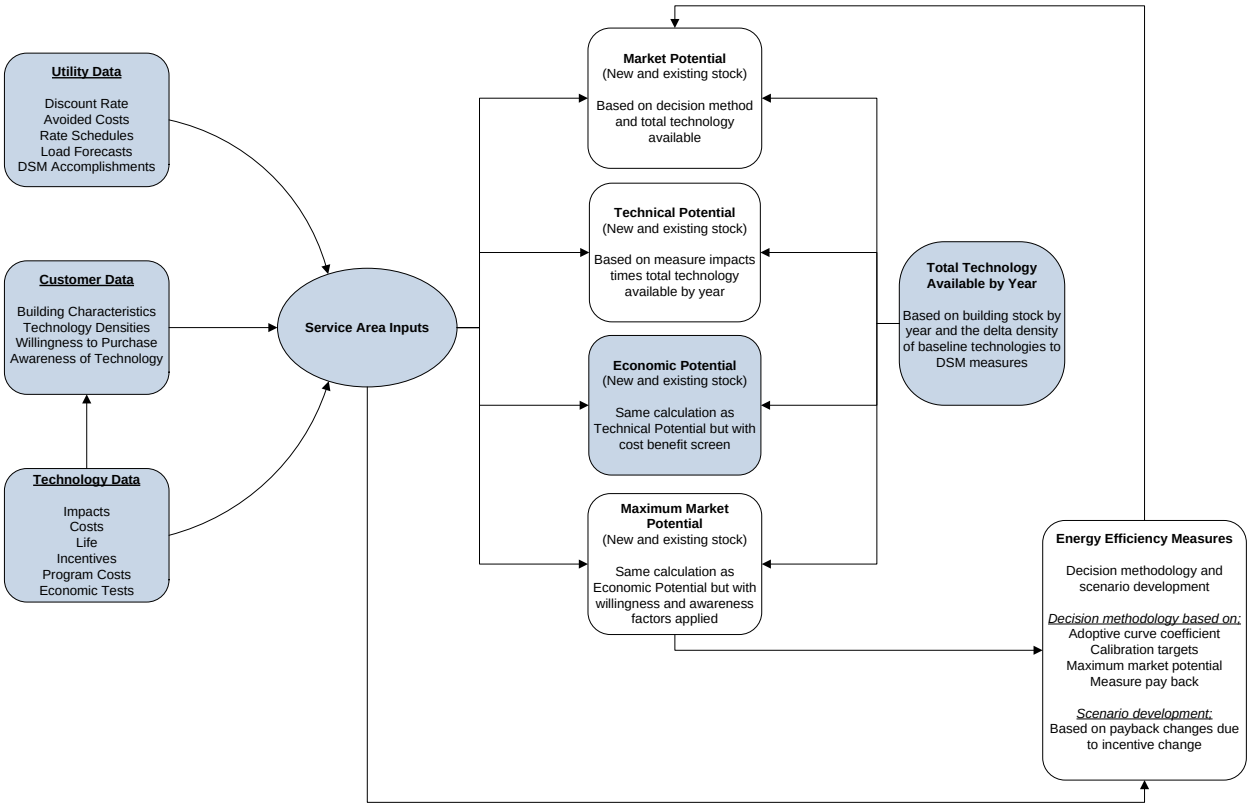
[2] The Capital Recovery Factor is the ratio of a constant annuity to the present value of receiving the annuity for a given length of time.

- Determine the total cost-effective energy savings available over the forecast period, both annually and cumulatively. This is determined for 100% of retail energy use in utility service territories. These estimates are provided at the sector, program type, and end-use classification levels.
- Provide guidance for the utilities' next energy efficiency goals at an aggregate level, as well as at the measure category level, where appropriate. To ensure continuity with past utility program achievements, the EERAM calculations are calibrated to past utility achievement levels.

The model is segmented into four sections.

- Section 1 – Introduction and Scenario Defining
- Section 2 – Summary Outputs
- Section 3 – Time Dependent Input Variables
- Section 4 – Model Calculations

Figure 2: EERAM Input Information and Model Calculation Flow



Overview of Model Sections

Model Section 1

The first section of EERAM is essentially the user interface of the model. This section provides the list of scenario assumption inputs that can be used to adjust the results of the EERAM model, as well as the rolled up outputs. It includes two primary worksheets that help define scenarios and identify utility service area variables. The "Summary Parameters" worksheet identifies the following utility specific data:

- Time/Area parameters
- Financial & rate inputs
- Avoided costs
- Energy and demand consumption forecasts
- Building stock forecast
- Miscellaneous data

The "Scenario Switches" worksheet is used to define the characteristics and underlying assumptions of the model results. These switches include:

- On/off switch to include Interactive Effects on heating and cooling end-uses
- Selection of the calibration year or calibration method
- Base incentive level (expressed as a percentage of incremental measure cost). Base incentives can also be specific to a measure. This variable is used when the incentive level is unknown or thought to be close to 50% of incremental cost.
- Scenario incentive level (expressed as a percentage of incremental measure cost).
- TRC screening value for existing measures
- TRC screening value for emerging technologies
- Maximum % for Willingness and Awareness multiplier (100% or less)
- Minimum % for Willingness and Awareness multiplier (0% to 100%)
- On/off switch to include emerging technologies
- On/off switch to include codes and standards
- On/off switch to include behavior programs
- On/off switch to include fuel switching measures (if fuel switching measures are included in the dataset of measures)
- Share of measure re-engagement at time of measure life decay (between 0.0 and 1.0)
- Share of these re-engagers that again participate in a utility program. (between 0.0 and 1.0)
- For diffusion curves, the starting share of measure impact, expressed as a percent of technical potential (0% to 20%)

Model Section 2

The second section of EERAM is the output tables and graphs, which compile the EERAM model results to present in the potential study report. The tables and graphs include values for technical, economic, and market potential by year, sector, end-use measure category, and measure type. The top twenty measures are identified and a supply curve is calculated.

Figure 3 illustrates the different mixes of measures when considering economic potential vs. market potential. Table 1 illustrates the top 20 measures in 2014 for incremental market potential. Figure 4 illustrates a supply curve graph from the model. A summary of costs and cost tests are also provided.

Figure 3: Share of Economic and Market Potential by Deer Category

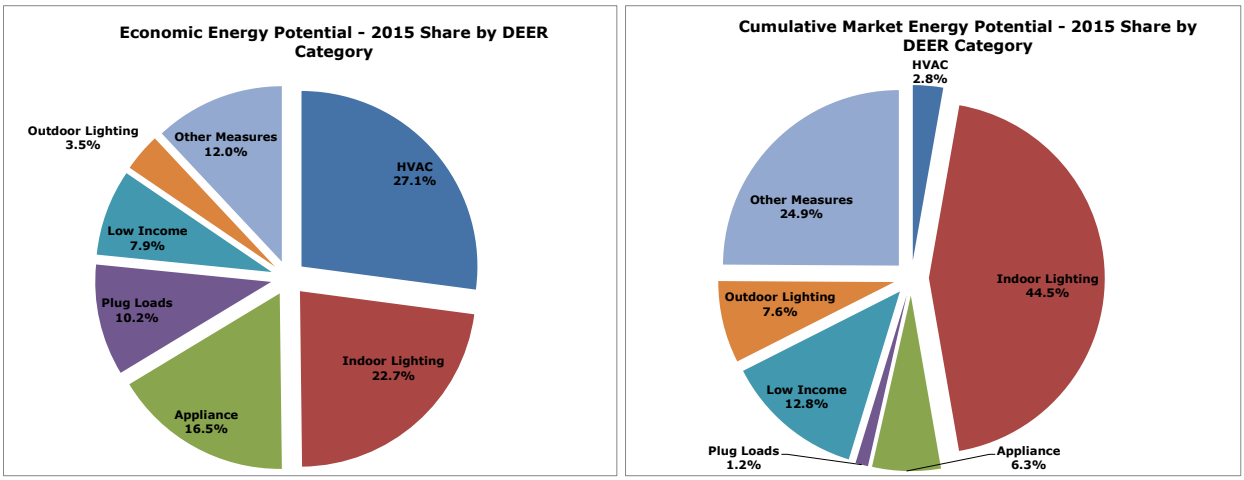
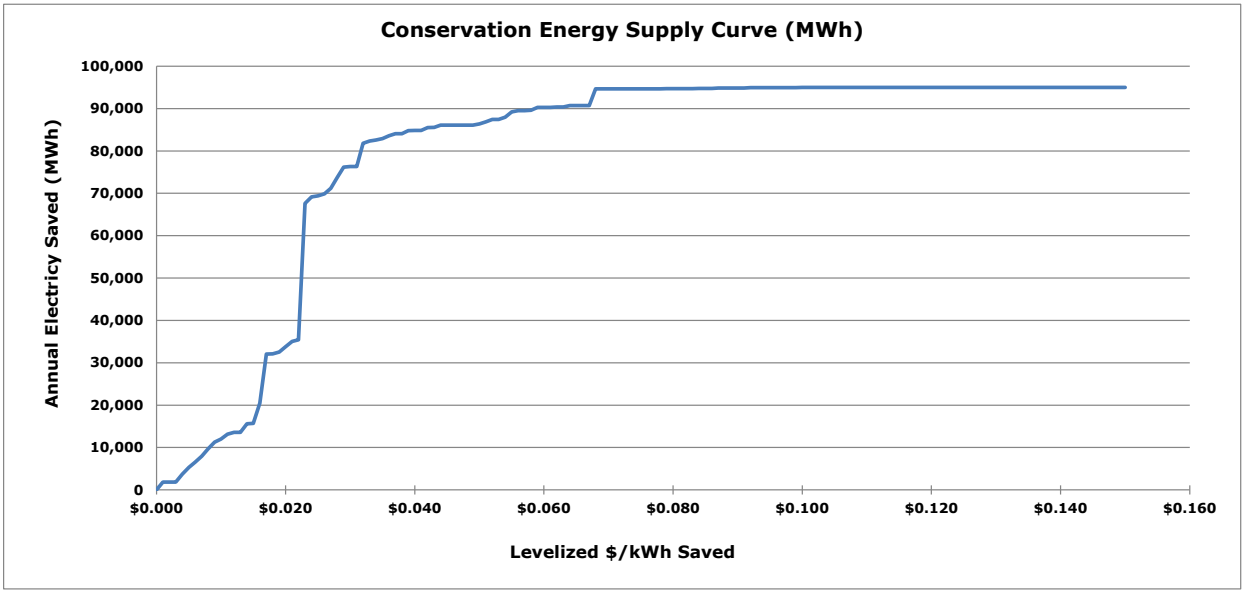


Table 1: Top 20 Measures in 2014

Rank	Top Twenty Measures - 2014	2014 - Energy Savings (MWh)	2014 - Demand Savings (KW)	Energy % of Total	Demand % of Total
1	SFE - Effcient Set Top Box	26,719	0.0	24.7%	0.0%
2	SFE - Home Energy Report	13,263	0.0	12.3%	0.0%
3	Com - Advanced Generation T8 - 4ft	8,941	2,438.5	8.3%	17.5%
4	MFE - Effcient Set Top Box	5,037	0.0	4.7%	0.0%
5	SFE - LED Holiday Lights (300 bulb string)	4,312	0.0	4.0%	0.0%
6	SFE - HVAC Quality Maintenance	3,969	3,649.4	3.7%	26.2%
7	Com - Window film	3,826	450.1	3.5%	3.2%
8	SFE - CFL: 23W Screw-In Outdoor	2,415	0.0	2.2%	0.0%
9	Com - Fault Detection & Diagnostics	1,852	1,042.0	1.7%	7.5%
10	SFE - Recycle refrigerator	1,711	252.7	1.6%	1.8%
11	Ind - Pumps_Controls	1,484	277.0	1.4%	2.0%
12	Ind - Pumps_System_Optimization	1,394	260.1	1.3%	1.9%
13	Com - EMS	1,150	121.0	1.1%	0.9%
14	Com - Lighting Controls - Timeclock	1,145	203.0	1.1%	1.5%
15	Com - Linear fluorescent delamping 4 ft	1,061	289.8	1.0%	2.1%
16	Ind - Compressed_Air-OM	983	183.4	0.9%	1.3%
17	SFE - CFL: 13W Screw-In Indoor	977	138.9	0.9%	1.0%
18	Com - LED Exit sign	877	100.1	0.8%	0.7%
19	Com - Variable Refrigerant Flow (VRF) Chiller	864	431.8	0.8%	3.1%
20	SFE - Smart Strip	824	52.0	0.8%	0.4%
	Top 20 Total	**82,805**	**9,890**	**76.5%**	**71.1%**

Figure 4: Technical Potential Supply Curve



Model Section 3

The third section of EERAM includes various time dependent inputs and adjustment worksheets. These are a series of sheets that take input data and create changes to the baseline data over time. A short description of each of these worksheets follows:

- **Worksheet "Program Accomplishments"** Utility achievements by measure or measure group are input here. The data collected is for the years 2006 to the most current available. This data is used for model calibration at the measure level.
- **Worksheet "Avoided Costs"** Avoided costs by year and by measure group are input here. This includes both electric and natural gas avoided costs. The electric avoided costs include both energy and peak demand.
- **Worksheet "Technology Costs"** First year technology costs are input in the "Mea-In" worksheet. However, the model allows for changes in cost over time. The time vector of any cost changes by measure is included here.
- **Worksheet "Administrative Costs"** First year administrative costs are input in the "Mea-In" worksheet. However, like with technology costs, the model allows for administrative cost to change over time. The time vector of any administrative cost changes by measure is included here.
- **Worksheet "Willingness and Awareness"** The first year willingness and awareness variables are input in the "Mea-In" worksheet. Within this worksheet, it is assumed that willingness and awareness improve over time, within a prescribed limit (limit input in the "Scenario Switches" worksheet). The year by year improvement follows an "S" curve function. The degree of change from year to year is slower if the incentive level drops below 50% and higher if above 50%.
- **Worksheet "Impact Change - Non Codes"** First year measure impact estimates are input in the "Mea-In" worksheet. Three baseline estimates of measure impacts come from the "Mea-In" worksheet. The first is for the years 2006-2010. These baseline impact estimates are intended to represent the impact estimates at that point in time. The second baseline is for the years 2011-2013 and represents the impact estimates at

that point in time. The third begin in 2014 and are designed to represent the best available estimates of measure impact currently available.

- **Worksheet "Measure Impact - Codes and Standards"** Codes and standards significantly affect some measure impacts over time. Estimates of changes to measure impacts from codes and standards are identified here at the measure level by year.
- **Worksheet "Measure Impact - Combined Non-Code and Codes and Standards"** Percentage representation of impact changes from the combined effects of non-code and Code and Standards by year by measure are identified in this worksheet.
- **Worksheet "Diffusion"** For emerging technologies and for existing technologies that do not pass the TRC screen until later, a Bass Diffusion Curve is used to simulate year-by-year program participation. For the diffusion formula a starting value and maximum are needed. The starting value is a percentage share of the technical potential and is currently set at 3%. The maximum value is represented as the technical potential for the measure multiplied by the willingness and awareness variables.

Figure 5 provides an illustration of some non-code related changes in measure impact over time. Figure 6 illustrates a sampling of changes to the consumer Willingness*Awareness curve over time. Figure 7 provides an illustration of a sample of measures impacted by the diffusion curve methodology over time.

Figure 5: Sampling of Percent Change to Non-Code Measure Impacts Over Time

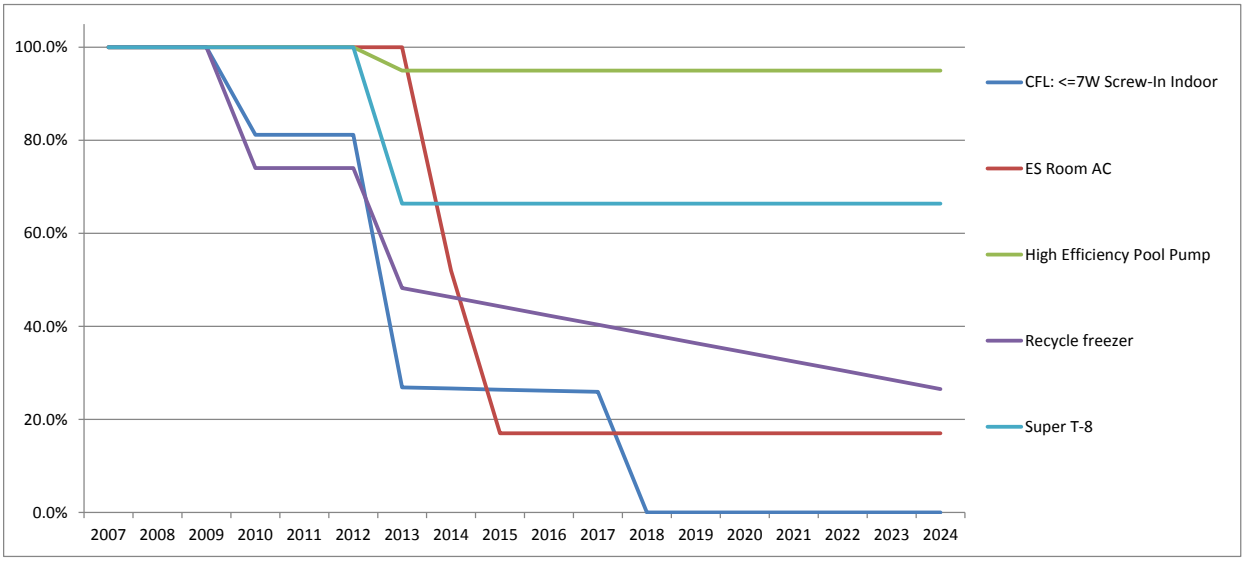


Figure 6: Sampling of Willingness and Awareness Changes Over Time

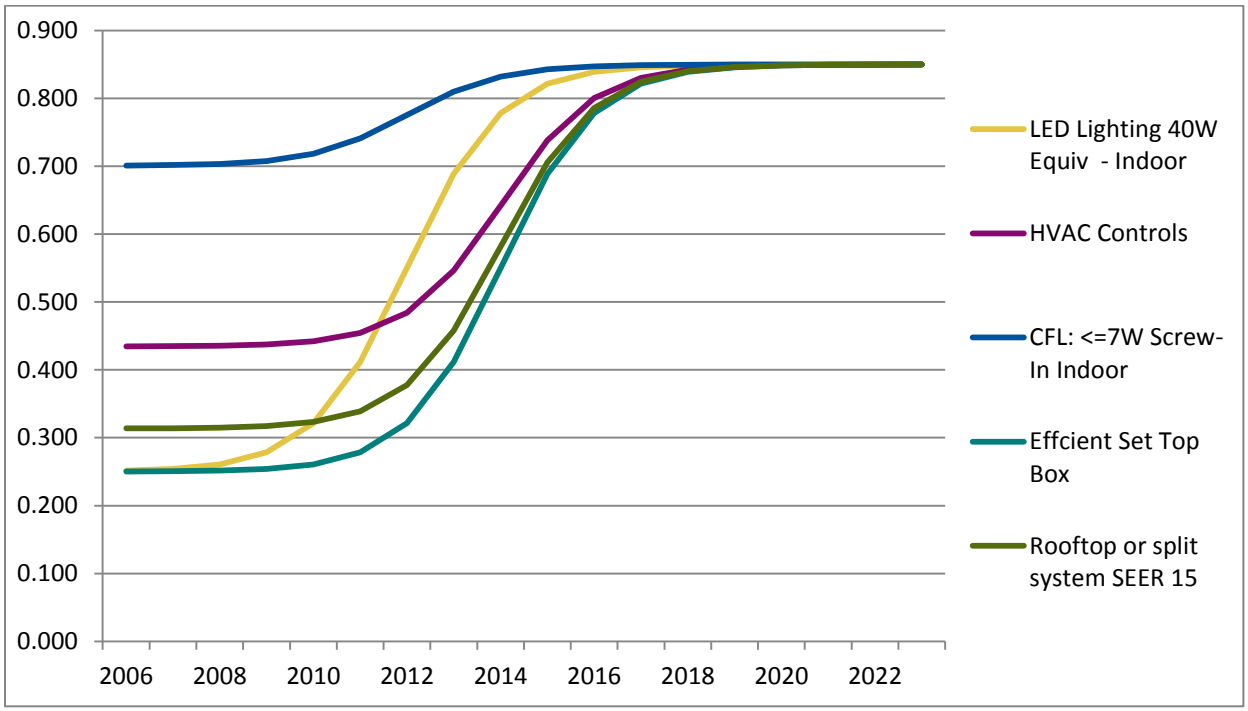
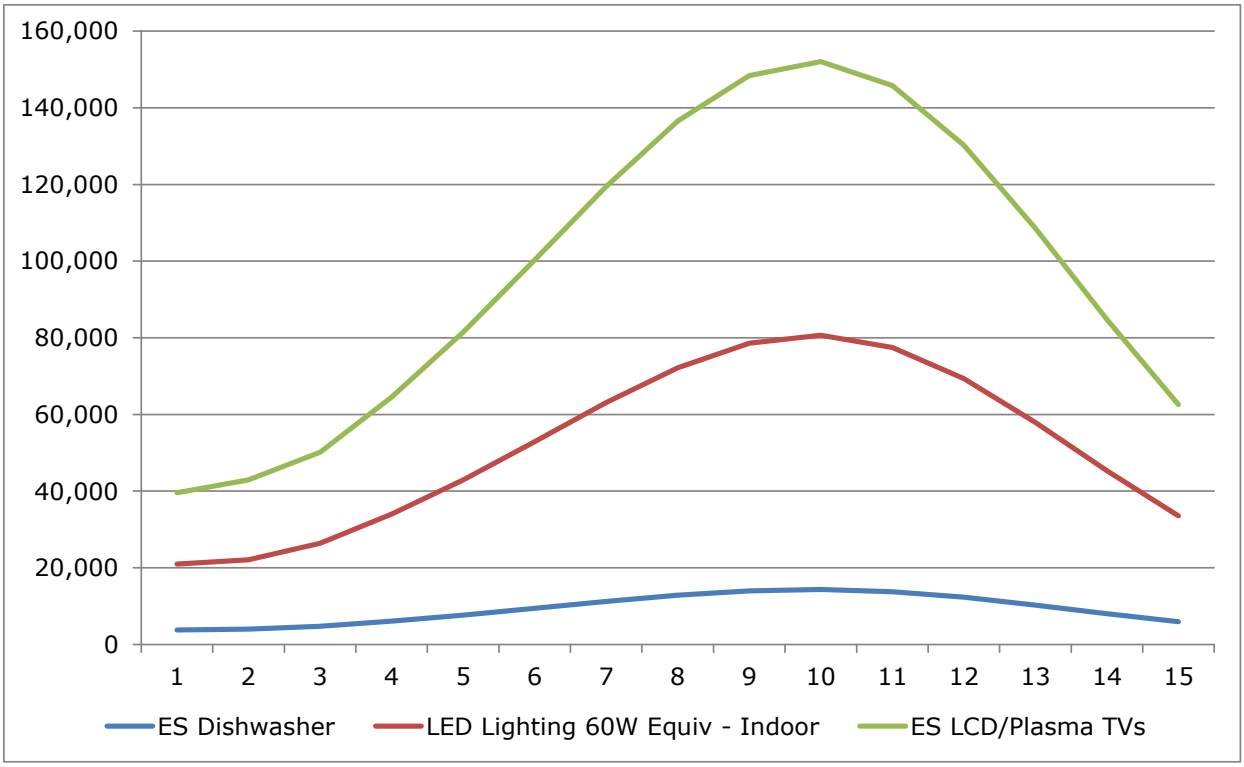


Figure 7: Sampling of Diffusion Curve Based Incremental Participation Over Time



Model Section 4

The final section of the model is where the primary measure level detail is input and where the calculations take place. There are 17 worksheets in this section, each representing a step in the development of the different potential estimates, costs, and financial tests.

Technology Input

The various input technology components are found in the "Mea-In" (Measure Input) worksheet. Descriptions of each technology input and their role in the potential study calculations are discussed in section 3.4. The sources for each input are listed by measure in the stand-alone Measure Input Characterization Sheets (MICS). The key variables are as follows:

- Fuel Share – This value identifies what portion of the building stock has the proper fuel type for the measure. For some measures and building types, the fuel share is built into the density values.
- Applicability - This value identifies the share of the building stock in which each measure can be implemented. For many measures, this value is 100%. Some measures have applicability directly input based on the user's knowledge of the measure and building application. For mutually exclusive measures, applicability will be split in a later step among the competition group measures with the weight being each measure's share of individual TRC to the competition group TRC sum. This weighting is re-done each forecast year as TRC values change.
- Efficiency Measure – The measure name.
- Base Measure – The base technology for the measure.
- Building Type – The building type application of this measure.
- Measure Category – The grouping of measures into end-use related identifiers.
- DEER Category – The end-use grouping, as identified by the DEER database.
- Measure Classification – The classification of measures with the identifications being 1) High Impact Measures (HIM), 2) Secondary Measures - measures included in past utility portfolios, but which historically provide low levels of energy savings, 3) Measures of Interest (MOI) – existing measures that may not have provided high levels of energy savings in the past, but are expected to in the future, 4) Emerging Technology (ET), and 5) Behavior – measures designed to reduce energy use through changes in maintenance and attitudes.
- Units – The common units for the measure such as bulb, refrigerator, home, etc.
- Base Technology Density – The number of baseline technology common measure units within a building type (residential), per 1,000 sq. ft. of building space (non-residential), or per kWh (Industrial).
- Efficient Technology Density - The number of efficient technology common measure units within a building type (residential), per 1,000 sq. ft. of building space (non-residential), or per kWh (Industrial).
- Total Maximum Density - The total of baseline and efficient technology common measure units within a building type (residential), per 1,000 sq. ft. of building space (non-residential), or per kWh (Industrial).
- Technology Awareness – The share of decision makers who are aware of the efficient technology. Value is directly input.
- Purchase Willingness – Of the decision makers who are aware, the share of decision makers willing to install the efficient technology. Value is directly input.

- Modeling Energy Impact (kWh/Unit) – The starting energy input value used in the model at 2013. It can be either ex ante or ex post, depending on the designation provided in the "Scenario Switches" worksheet.
- Coincident Summer Peak watts/kWh ratio – The ratio of demand to energy used to calculate peak demand potential. This value is the starting value used in the model at 2013. It can be either ex ante or ex post, depending on the designation provided in the "Scenario Switches" worksheet.
- Ex Ante Energy Impact (kWh/unit) – The starting 2013 value used in the model if an ex ante analysis is identified in the "Scenario Switches" worksheet.
- Ex Post Energy Impact (kWh/unit) – The starting 2013 value used in the model if an ex post analysis is identified in the "Scenario Switches" worksheet.
- Ex Ante Coincident Summer Peak watts/kWh ratio – The starting 2013 value used in the model if an ex ante analysis is identified in the "Scenario Switches" worksheet.
- Ex Post Coincident Summer Peak watts/kWh ratio – The starting 2013 value used in the model if an ex post analysis is identified in the "Scenario Switches" worksheet.
- Avoided Cost Index – Different avoided cost streams affect measures depending on the end-use affected. Identification of which avoided cost stream to use is provided here.
- Net-to-Gross Factor Used in the Model – A net-to gross value of either 1.0 or a value based on EM&V is input here. Which value used is determined by the switch selected in the "Scenario Switches" worksheet.
- Measure Life – The measure's effective measure life. – The percent of the energy impact that occurs during the winter on-peak hours. Value is directly input.
- Modeling Therm Impact (Therm/Unit) – The starting therm input value used in the model at 2013. It can be either ex ante or ex post, depending on the designation provided in the "Scenario Switches" worksheet.
- Base Incentive ($/unit) – The base year incentive cost per unit. These values are either directly input or are calculated as a percent% share of measure incremental cost. The percent share comes from the "Scenario Switches" worksheet.
- Technology Cost ($/unit) – The increment or total cost of the efficient technology. The value is incremental if the program is replace on burnout. If the program is a retrofit program the full cost (labor and incremental technology cost) is applied.
- Administrative Cost ($/unit) – Expressed as a cost per unit and calculated by taking the amount of measure savings and multiplying it against the administrative cost/savings unit that comes from the Summary Parameters worksheet.
- Calibration Target (either MWh or Therms) – This is a calculated value at the measure level that represents energy savings in the calibration year. The formula takes the form:

  Calibration Target = Calibration target by sector and end-use * Measure maximum market potential / Total end-use maximum market potential

  Where:

  - Calibration target by sector end-use comes from the "Program Accomp" worksheet
  - Measure maximum market potential is first year Economic potential * Awareness * Willingness
  - Total end-use maximum market potential is the sum of the above across all measures in each end-use

- Fuel Share and Applicability Adjustment – Some measures are limited in their application by their end-use fuel type and any limitations to installation that may exist due to building or appliance characteristics. This value is the product of these two limitations with the form applicability * fuel share
- Decision Type – Identifies the type of program for implementation. Can be retrofit, replace on burnout, behavioral, or new construction.
- Efficiency Competition Group – Some efficiency measures, such as CFLs and LEDs can be installed to replace the same base technology (in this example incandescent lamps). Only one or the other can be installed, and to prevent double counting, each group of measures considered to be mutually exclusive is assigned a unique number code.
- Net to Gross Factor – EM&V based net to gross values
- Payback Sensitive – A yes or no variable that indicates if the measure payback stock participation algorithm is appropriate for the specific measure. Some measures, such as be the Home Energy Report, is not considered to be sensitive to any changes in payback.
- 2006 Energy Impact (kWh/unit) – The model begins several years in the past when different assumptions on energy impact may have existed. These values are used for the early years of the forecast.
- 2006 Coincident Summer Peak watts/kWh ratio – The model begins several years in the past when different assumptions on energy impact may have existed. These values are used for the early years of the forecast.
- Learning Rate Code – Technology cost for all measures is not considered static in all cases. Based on a US Department of Energy paper[12], technology costs fall over time at a rate that varies by technology. This code matches the appropriate learning curve to specific technology
- Number of Years Along the Learning Curve – Related to the learning curve code, measures vary as to where they lie on the curve. This variable estimates the location of a specific measure on its learning curve.
- Measure Availability First Year Index – Most measures are considered available for program promotion in the first year (2007) of the forecast. However, some measures are not available until later years (emerging technologies as an example). This variable indicates the first year of availability.
- Ex Ante Energy Impact (therms/unit) – The starting 2013 therm impact value used in the model if an ex ante analysis is identified in the "Scenario Switches" worksheet.
- Ex Post Energy Impact (therms/unit) – The starting 2013 therm impact value used in the model if an ex post analysis is identified in the "Scenario Switches" worksheet.
- 2006 Energy Impact (therms/unit) – The model begins several years in the past when different assumptions on impact may have existed. These values are used for the early years of the forecast.
- Gas Interactive Effects Applicability – Many measures have effects on other end-uses, such as lighting measures on increased heating load and decreased cooling load. This applicability identifies the appropriate share of the population affected by this interactive effect.
- Anticipated Impact Percent Change by end of Forecast – It is anticipated that for some measures the non-codes and standards affected energy impacts will change over the forecast period. An example is refrigerator recycling. In this instance, the energy impact is expected to decrease significantly by the end of

[12] U.S. Department of energy (2011). Using the Experience Curve Approach for Appliance Price Forecasting. Supplemental draft paper to the DOE proposed rule in Docket No. EE-2008-BT-STD-0012

the forecast as newer; more efficient refrigerators enter the population of refrigerators to be recycled. This value shows what percentage of the impact is expected to change over time.

- A/C Interactive Effects Applicability – Many measures have effects on other end-uses, such as lighting measures on increased heating load and decreased cooling load. This applicability identifies the appropriate share of the population affected by this interactive effect.
- A/C Interactive kWh/kWh Effects – For those measures that have cooling load interactive effects, this is the indicator of the amount of the energy interactive effect.
- A/C Interactive Watt/kWh Effects – For those measures that have cooling load interactive effects, this is the indicator of the amount of the demand interactive effect.
- Heat Interactive Therm/kWh Effects – For those measures that have heating load interactive effects, this is the indicator of the amount of the heating interactive effect.

Technical Potential

Technical potential is calculated on a per measure basis in the "Tech" worksheet It is the product of a measure's savings per unit, the quantity of applicable units in each facility (in the case of industrial, the number of units per kWh of sales), and the number of facilities in a utility service's area.

For measures considered to be replace on burnout, the quantity of applicable units per year is limited to the number that need to be replaced, which is determined by measure life. As time passes, this potential population grows until measure life is equaled. For other, non-replace on burnout measures, the full populations of baseline units are considered available.

The technical potential is calculated each forecast year. It reflects not only consideration of populations because of replace on burnout assumptions, as described above, but also takes into account building stock decay for existing buildings, and changes to measure impacts over time.

Building stocks are treated differently for new construction. Here, the technical potential is a running cumulative total for each year of the forecast. No net-to-gross adjustments occur with technical potential.

Avoided Cost Present Value Calculations

The present value of avoided costs for electric energy and demand as well as natural gas energy are calculated in the "Mea-Avoid" worksheet. The avoided costs are calculated for each measure and for each year in the forecast. The calculation takes the form:

PV Avoided Costs = PV (Discount Rate, Technology Life, Annual Avoided Costs * Net to Gross)

Where:

- Discount rate comes from the "Summary Params" worksheet
- Technology life comes from the "Mea-In" worksheet
- Annual avoided costs. There are different avoided cost streams by measure. They come from the "Avoided Costs" worksheet and the "Summary Params" worksheet
- Net-to-Gross comes from the "Mea-In" worksheet

Total Resource Cost (TRC) Calculations

The TRC values are calculated in the "TRC" worksheet. The TRC values are calculated for each measure and for each year in the forecast. The calculation takes the form:

Total Resource Cost Test = Avoided costs / (Administrative costs and technology cost)

Where:

- Avoided costs from the "Avoided Costs" worksheet
- Technology cost comes from a calculation of values from the "Impact Change Non-Code" worksheet and the "Code Based Impact Change" worksheet
- Administrative costs come from a calculation of values from the "Admin Cost" worksheet and the "Combined Percent Impact-Code" worksheet

In addition to calculating TRC values for each year by measure, this worksheet also identifies the competition share for those measures within competition groups. The share is calculated each forecast year and is based on each measures share of individual TRC to the competition group TRC sum.

Economic Potential

Economic potential is estimated by measure in the "Econ" worksheet. Economic potential estimates the amount of technical energy efficiency potential that is "cost-effective," as defined by the results of the Total Resource Cost (TRC) test. The TRC test is a cost-benefit analysis of relevant energy efficiency measures, excluding market barriers such as lack of consumer knowledge. Benefits include avoided costs of generation, transmission and distribution investments, as well as avoided fuel costs due to energy conserved by energy efficiency programs. Costs include incremental measure costs and program's administration costs. The treatment of new construction, replace on burnout measures and net-to-gross is the same as with technical potential.

As with technical potential, economic potential is estimated by measure for each year of the forecast. The TRC screen used to identify economic potential, which is also re-calculated each year in the forecast, can have significant effects on economic potential and the economic potential curve may be a different shape compared to technical potential. Measures can fall in and out of economic potential based on the year by year screening.

The value of the TRC screen is a variable set in the "Scenario Switches" worksheet. The model has the capacity to consider a separate TRC screen value for emerging technologies. For exiting measures, a value commonly used is 0.8. This is less than 1.0 at the measure level, but is designed to allow for a packaging of measures around the TRC of 1.0, which gives a program package TRC value of 1.0 or greater.

Calibration

The calibration function is used for measures that exist in the file of historical utility program achievements, as identified in the "Program Accomp" worksheet. The calibration function is used in the "Stocks" worksheet to identify program participation year by year. The initial calibration factor is determined by actual utility accomplishments and the payback associated with each measure in the calibration year. This initial calibration factor is used each year to estimate program participation; as available stocks and payback changes, participation changes. Program participation by year for measures not included in the "Program Accomp" worksheet is estimated using Bass Diffusion Curves, discussed earlier in the Model Section 3 discussion.

Components making up the calibration function, which is implemented in the "Stocks" worksheet, are developed here in the "Calibration" worksheet. Key variables include measure payback by year and the market factor.

Payback is simple payback with the basic calculation for year "n" taking the form:

Payback (n) = (Incremental technology cost – incentive cost (n)) / electric bill reduction (n)

The "market factor" is a calibration constant that is computed in the first simulation year to adjust computed participation shares to equal the calibration targets. The calibration targets for each measure are determined from the data provided in the "Program Accomp" worksheet. In the base year, the market factor is calculated using the following form:

Market factor = calibration target / (total available base technology measures available) * EXP (0.0 - Beta Constant * Measure Payback)

Where:

- The calibration targets for each measure are determined from the data provided in the "Program Accomp" worksheet
- The total available base technology measures available is the measure economic potential * Awareness * Willingness
- The Beta constant represents the average influence of excluded (non-payback) factors

If scenarios based on changes in incentive levels are initiated, the simple payback by measure is re-calculated for each year after the first year. The first year value is not changed since we do not want to re estimate the market factor. Keeping the market factor constant to its base incentive value ensures that response to changes in payback can be observed.

Identification of Market Participants

The "Stocks" worksheet is where the number of units forecasted to be delivered through a program is calculated. Two methods are used to create these participation estimates. The first is for measures currently in a utility program portfolio. The second is for both emerging technologies and measures not currently in a utility program portfolio.

For measures where calibration can occur, the market factors developed in the "Calibration" worksheet are utilized. The decision adoption algorithm simulates consumer choice based on simple measure payback and other decision components. For each measure by year, the algorithm estimates the number of units implemented. The algorithm has the following form:

Number of measures implemented = total available measure units * binary logic function * market factor * decision maker measure awareness and willingness to install the measure.

The "total available measure units" is a variable that changes with each forecast year and differs depending on whether the measure is a replace on burnout or a retrofit. For retrofit measures, the calculation has the form:

Total available measure units = Available building stock * (maximum density for the competing technologies – base year efficient technology density) – running sum of previous years of efficient technology units installed.

For replace on burnout measures, the calculation has the form:

Total available measure units = Available building stock / measure life * (maximum density for the competing technologies – base year efficient technology density) – running sum of previous years of efficient technology units installed.

The "binary logit function" identifies the share of the efficiency measures implemented each year. The logit function has the form:

Share of Efficiency Measures Implemented = Exp (0.0 – Beta Constant * Measure Payback)

Where:

- The Beta constant represents the average influence of all excluded (non-payback) factors.
- The Beta constant is allowed to be modified at the end use level (within bounds):
  - Larger number representing influences that speed up adoption.
  - Lower number representing influences slowing down adoption (such as a recession).

- Measure payback is simple measure payback and is calculated for each measure, each forecast year.

The market factor helps determine year by year measure implementation. This factor is calculated in the “Calibration” worksheet. The willingness and awareness value limits participation to only those who are aware of the measure and also willing to install the measure. This value changes from year to year and is estimated in the “W&A Time Vector” worksheet.

For emerging technologies and for existing technologies that do not pass the TRC screen until later in the forecast, a Bass Diffusion Curve is used to simulate year by year program participation. The Bass diffusion model was developed by Frank Bass and describes the process of how new products get adopted as an interaction between users and potential users. It has been described as one of the most famous empirical generalizations in marketing. The model is widely used in forecasting, especially product forecasting and technology forecasting. It takes the form:

Measure Adoptions (t) = (p + q * (X(t-1) / m)) * (m - X(t-1))

Where:

- t = time
- p = The coefficient p is called the coefficient of innovation, external influence or advertising effect.
- q = The coefficient q is called the coefficient of imitation, internal influence or word-of-mouth effect.
- X(t-1) = Cumulative adoptions up to time "t"'
- m = the number of potential adopters

For newer technologies regardless of type, the average value of p has been found to be 0.03, and is often less than 0.01. The average value of q has been found to be 0.38, with a typical range between 0.3 and 0.5. The value for “m” is the measure’s technical potential. The initial value for “X(t-1) is a share of the measure’s technical potential. This value is set as a variable by measure with the current value set at 2.5%.

At times of any significant change in the payback values, participation may radically change. If it is desired, these radical transitions can be smoothed. The smoothing is an average of the previous year’s participation and the current year’s participation. Determination of the weighting placed on the previous year’s participation is done through the smoothing variable found in the “Scenario Switches” worksheet. The smoothing function takes place in the “Smooth” worksheet.

Incremental Market Potential

Incremental market potential by measure is calculated in the “New Partic” worksheet. The calculation takes the form:

Incremental First Time Energy Potential = Participant common units * Energy impact/unit * Net-to-gross

Where:

- Participant common units is calculated in the “Stocks” worksheet and smoothed in the “Smooth” worksheet
- Energy impact/unit comes from the 'Impact Change-Non-Code” and ”Code Based Impact Change” worksheets
- Net-to-gross come from the “Mea-In” worksheet

Measure Re-Engagement Adjustment

Adjustments caused by measures reaching the end of their measure life are calculated in the "Re-Partic" worksheet. Measures accrue savings, as determined at the time of their initial participation, through the end of their measure life. At the end of measure life, a certain percentage of these original participants are assumed to participate again, with the remaining balance returning to the stock considered to be base measures. Those who re-engage accrue savings at whatever the current applicable measure impact level is. The cumulative potential is reduced by the increment between the impact value at the time of original participation and current year impact value. Incremental savings are unaffected.

The percentage of those considered to be re-engagers is an input value that can range from 0.0% to 100%. This value is input in the "Scenario Switches" worksheet.

Measure Re-Participation in the Utility Program

Adjustments caused by measures reaching the end of their measure life are calculated in the earlier "Re-Partic" worksheet. In this "Re-Partic-Utility" worksheet, the portion of the re-engagers that also participate again in the utility program is calculated here. The number of these re-participants is a subset of the re-engagers. The percentage of those considered to be utility program re-participants is an input value that can range from 0.0% to 100%. This value is input in the "Scenario Switches" worksheet.

Costs of Measure Re-Participation in the Utility Program

The number of utility program re-participants is calculated in the earlier "Re-Partic-Utility" worksheet. In this "Re-Partic-Utility-Cost" worksheet, the addition costs for incentive and admin cost associated with these re-participants is calculated. These re-participant costs represent an additional financial burden to utility programs that comes without the benefit of any additional incremental energy savings.

Cumulative Market Potential

The running summation of cumulative market potential energy savings is calculated in the "Cum-Potential" worksheet. The values are a summation of the incremental market potential estimates less adjustments made at the time of measure re-engagement.

The Number of Incremental Common Units

In the worksheet "Units", the incremental first time participant energy savings calculated in the "New Partic" worksheet are converted to the number of common measures implemented. The calculation is a simple division of the incremental first time total participant energy savings by the per unit energy impact. Also included in this worksheet is a year by year estimate of measure saturation. This measure saturation calculation takes into account overall potential density, initial base year saturation, changes in saturation due to new participants, and changes in saturation caused by the number of potential re-engagement applications that do not re-engage, but rather revert back to the base technology.

Market Potential Costs and Cost Tests

Within the "Cost-Benefits" worksheet, measure level costs and benefits are calculated. The costs and benefits calculated include:

- Incremental technology cost
- Administrative costs
- Incentive costs
- Avoided cost benefits

- Utility bill reductions.

Within the “Financial Tests” worksheet, these streams of costs and benefits are converted to a net present value using the discount rate input in the “Summary Parameters” worksheet. Using this data, four financial tests are calculated. These include:

- Total Resource Cost (TRC): This test includes all quantifiable costs and benefits of an energy efficiency measure, regardless of who accrues them.
- Utility Cost Test (UCT): This test measures the net costs of an energy efficiency program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant.
- Ratepayer Impact Test (RIM): This test measures what happens to customer bills or rates due to changes in utility revenue and operating costs caused by the program.
- Participant Cost Test (PCT): This test measures the quantifiable benefits and costs to the customer due to participation in the program

Key Assumptions and Modeling Issues

Measure Re-Engagement and Re-Participation

Estimating measure re-engagement and re-participation is a two-step function used both to identify what share of initial participants continue saving energy by installing a new measure similar to the original measure and second, what portion of these re-engagers again partake in a utility program. If the re-engaging share is 85% (which is what the variable is the current default value), then 15% are thought of as returning to the baseline population. As this 15% are once again members of the baseline population, they can now participate in any program that affects this baseline.

There are no incremental savings accruing from this re-engaging population. However, cumulative savings must be adjusted in two ways. First, the 15% that go back to the baseline population needs to have their savings removed from cumulative savings. Second, for the 85%, adjustment to cumulative potential is dependent upon whether the savings are different from what was achieved at the time of the original participation. If unchanged, no changes to cumulative potential. If savings are different, then the cumulative potential is adjusted by this delta difference.

Re-participants are the re-engagers that again take advantage of the utility program at the point of re-engagement. All energy impact adjustments to cumulative potential have been performed when estimating the impacts from re-engagers. However, with re-participants, the utility is incurring additional incentive and administrative costs, although they gain no additional incremental savings.

Currently, the California Public Utilities Commission (CPUC) believes that re-participation is about 50% of original participants. To come to this 50%, the re-participation variable is currently set to 60%. This says that 60% of the re-engaging population (85%) are re-participants (85% * 60% = 51%). Incentive and admin costs are incurred by the utility for this 51% group of re-participants. In order to identify the amount of energy impact that is represented by these re-participants, EERAM has separate tables that identify this total.

Appliance Recycling

Appliance recycling programs need special treatment because of the unique characteristics of the base population. Unlike other base technologies, the used appliance stock available for recycling is constantly being refreshed with new populations of appliances. Further, due to past improvements to appliance efficiencies (primarily C&S), the constantly refreshing population of available appliances for recycling is more efficient (and thus saves less energy) from year to year. Thus, available populations of appliances for recycling do not change significantly from year to year, but the time vector of savings per unit does decline.

Potential Changes in Measure Costs Over Time

Measure technology costs are allowed to change over time and have technology cost vectors similar to the measure efficiency time vectors. Based on a US Department of Energy paper[13], technology costs come down over time at a rate that varies by technology. Within EERAM, the measures are mapped to a code that best matches the curves of technology cost reduction as identified in the DOE paper. This code matches the appropriate learning curve to the technology, with several technologies coded as having no change. Another variable in the model estimates where the technology is on the learning curve in terms of maturity.

Table **2** lists the technologies, years, and associated cost learning rates.

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[13] U.S. Department of energy (2011). Using the Experience Curve Approach for Appliance Price Forecasting. Supplemental draft paper to the DOE proposed rule in Docket No. EE-2008-BT-STD-0012

Table 2. Learning Rates by Technology13

Code	Technology	Years	Learning Rate
1	Clothes Washers	35	0.42
2	Refrigerators	33	0.52
3	Freezers	20	0.38
4	Room AC	19	0.40
5	Unitary AC	30	0.18
6	Gas Water Heaters	35	0.13
7	Elec Water Heaters	52	0.17
8	CFLs	8	0.53
9	NO CHANGE	0	1.00
10	Generic ET	8	0.53

Behavior Based Energy Savings Potential

Savings potential from behavior-based initiatives was included in the EERAM model. For the purposes of this study, Navigant defines behavior-based initiatives as those providing information about energy use and conservation actions, rather than financial incentives, equipment, or services. These initiatives use a variety of implementation strategies including mass media marketing, community based social marketing, competitions, training, and feedback[14].

Outcomes from behavior-based initiatives that result in energy savings can be broadly characterized as equipment-based and usage-based:

- **Equipment-based behavior –** Savings from the purchase and installation of higher efficiency equipment, relative to baseline conditions[15]. Examples of equipment-based behavior include the replacement of lights with higher efficiency lights, purchasing Energy Star qualified appliances, and purchasing premium efficiency motors. In the EERAM Model, these savings are modeled at the equipment level as contributions to the percentages of the population that are aware of the measure and that are willing to adopt this measure.

  Equipment-based behavior can be sub-categorized as:

  - **Non-incented equipment-based behavior** – The purchase of higher efficiency equipment for which no incentives are provided.
  - **Incented equipment-based behavior**– The purchase of higher efficiency equipment for which incentives are provided. Also known as "channeling".

[14] *Evaluation of Consumer Behavioral Research*, Navigant (Summit Blue Consulting) for the Northwest Energy Efficiency Alliance, April 6, 2010, Page 4.

[15] This could be either the early retirement of older equipment or the installation of high-efficiency equipment at the natural time of installation or replacement.

- **Usage-based behavior** – Savings from changes in usage and maintenance of existing equipment. Examples of usage-based behavior include turning off lights, unplugging electronics and chargers, programming thermostats, and improving the efficiency of equipment through modified maintenance practices. In the EERAM model, these savings are modeled as an equipment-independent module with savings unassociated with equipment improvement

Navigant found that the most rigorous residential behavior savings estimates available are from feedback program evaluations. Feedback programs provide energy use information to participants in the form of reports, online audits, or in-home displays. We focused on these programs because they broadcast to entire populations and often are implemented with experimental design that enables the precise estimation of impacts[16]. For this study, Navigant narrowed its research to OPOWER[17] Home Energy Report programs and similar periodic feedback report programs that provide monthly information on home energy use as well as the energy use of other homes in the area.

Navigant identified seven recent evaluations covering approximately 15 different programs. We extracted the average household energy reduction from each of these evaluations, which ranged from 1.1% to 2.9% per household and averaged 2.3% across all of the evaluations[18]. These estimates are based on whole-house billing data analysis; while they are precise difference-in-difference estimates of impact at the whole-house level, they cannot identify the specific outcomes that lead to these impacts. That is, this analysis approach cannot differentiate between impacts from individual actions such as turning off appliances, turning down thermostats, or replacing inefficient equipment.. Thus, these billing-analysis based impact evaluations alone could not provide the granularity necessary for the EERAM model: the portion of impact from usage-based behavior and portions of impact from specific equipment-based behaviors.

In order to disaggregate the whole building savings into equipment-based and usage-based savings, Navigant searched for relevant impact studies with information about what types of behaviors make up reported savings. Unfortunately, there are few rigorous studies done on this subject. Navigant identified one Home Energy Report impact evaluation[19] that examined this disaggregation effectively. In addition to billing-analysis, the study included surveys of the control and experimental group members that asked what conservation actions the households had taken. The study found that equipment-based actions were the majority of actions for which the experimental group self-reported statistically significant higher rates of activity. However, the evaluation did not translate these reported actions into impact estimates. Based on this qualitative finding, that the examined programs tend to achieve more equipment-based than usage-based outcomes, along with discussions with program implementers, Navigant has estimated that 33% of the savings are equipment-based, and 67% are usage-based.

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[16] Impacts are typically on the order of two percent per household. Key components of proper experimental design for these types of programs include randomly selected control and experimental groups and large sample sizes (i.e., tens of thousands of households in each group).

[17] Home energy report programs, such as OPOWER, provide easy-to-understand information about a specific home's energy use, typically via direct mail. Most notably, the report summarizes how much energy the home uses and compares it to that of an "average neighbor". Households that use less energy than their average neighbor receive a smiley face on their report. The reports also include energy saving tips and projections of how much money the household might save by reducing its use.

[18] non-weighted average

[19] 2011. "Moving Beyond Econometrics to Examine the Behavioral Changes behind Impacts." Opinion Dynamics Corporation.

APPENDIX D: UTILITY EERAM DATA

This appendix consists of detailed narratives of each publicly owned utility energy efficiency programs, as well more general descriptions the utilities in general. Utility-specific summaries of their energy programs for FY2012, 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 2012. For more analysis on statewide energy efficiency data, see **Chapter III**.

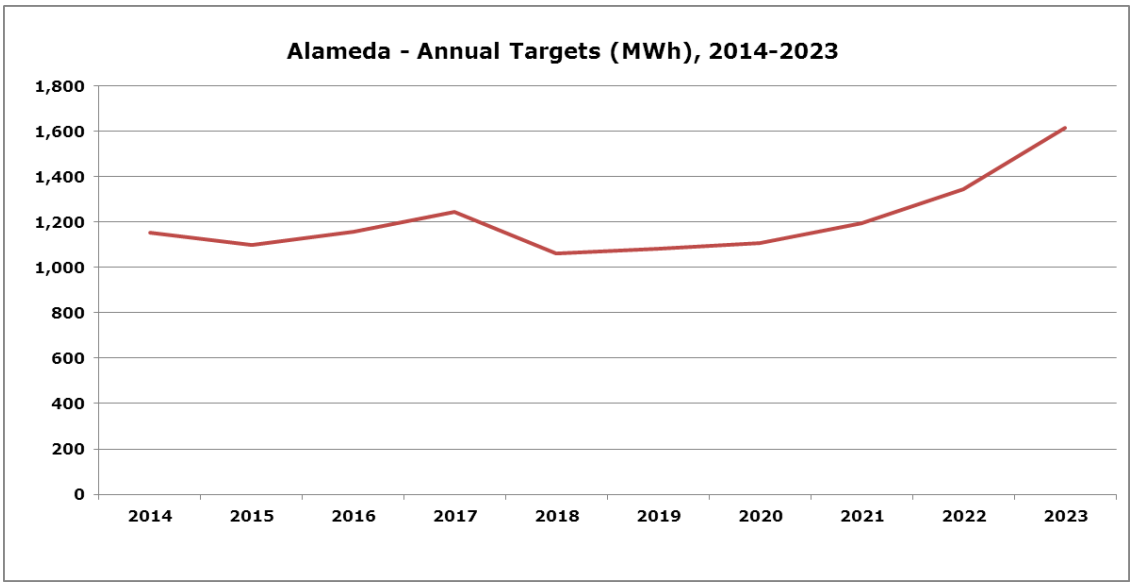
All POUs – Annual Targets (MWh), 2014-2023

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%
Hercules	22	24	25	25	21	22	22	23	24	24	232	0.13%
Imperial	16,675	15,773	15,965	17,271	18,039	18,684	21,187	21,745	23,880	27,803	197,022	0.57%
LADWP	***266,000***	***116,000***	***108,000***	***126,000***	***224,000***	***222,000***	***240,000***	***300,000***	***300,000***	***300,000***	***2,202,000***	***1.00%***
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	***151,534***	***148,703***	***160,063***	***175,936***	***167,620***	***184,253***	***195,745***	***215,432***	***207,313***	***200,738***	***1,807,337***	***1.50%***
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	602,383	454,005	461,027	499,687	586,513	601,652	639,712	725,664	725,015	723,311	**6,018,968**	**0.94%**

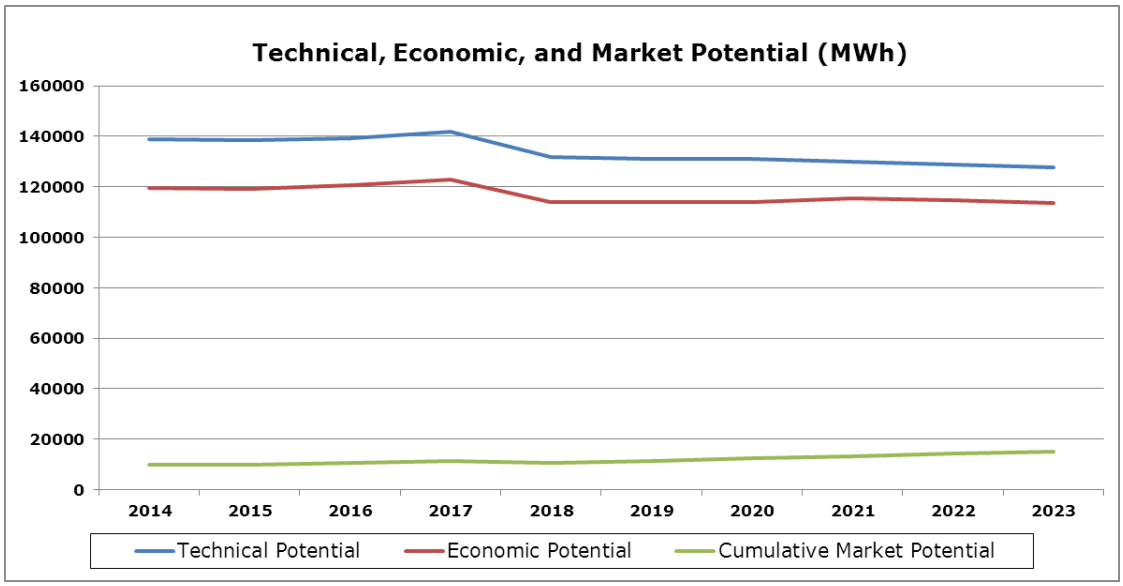
*IID, LADWP, Rancho Cucamonga and SMUD targets are preliminary. Final targets will be adopted later this year.

**TID's fiscal year is the calendar year and adopted goals for 2013-2022.

ALAMEDA MUNICIPAL POWER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**1,154**	**1,100**	**1,158**	**1,247**	**1,061**	**1,081**	**1,108**	**1,196**	**1,346**	**1,617**
Total Energy Use (GWh):	372.30	374.20	374.90	378.80	380.70	380.70	380.80	380.90	381.00	381.10
Residential Sector Energy Use (GWH):	140.00	140.90	141.70	142.60	143.30	143.50	143.40	144.30	145.00	145.60
Commercial Sector Energy Use (GWH):	219.26	220.20	220.11	222.94	224.07	223.88	224.07	223.32	222.75	222.28
Industrial Sector Energy Use (GWH):	13.04	13.10	13.09	13.26	13.33	13.32	13.33	13.28	13.25	13.22
Target as Percent of Total	***0.31%***	***0.29%***	***0.31%***	***0.33%***	***0.28%***	***0.28%***	***0.29%***	***0.31%***	***0.35%***	***0.42%***
Electric Demand										
Adopted Target (MW)	**0.17**	**0.17**	**0.17**	**0.19**	**0.16**	**0.16**	**0.17**	**0.20**	**0.23**	**0.29**
Total Demand (MW):	67.70	68.00	68.10	68.80	69.20	69.20	69.20	69.20	69.30	69.30
Residential Demand (MW):	25.46	25.60	25.74	25.90	26.05	26.08	26.06	26.22	26.37	26.48
Commercial Demand (MW):	14.99	15.07	15.11	15.24	15.33	15.34	15.33	15.37	15.42	15.44
Industrial Demand (MW):	0.53	0.53	0.53	0.53	0.54	0.54	0.54	0.54	0.54	0.54
Target as Percent of Total	***0.25%***	***0.24%***	***0.25%***	***0.28%***	***0.23%***	***0.24%***	***0.25%***	***0.29%***	***0.34%***	***0.42%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	30,778	29,933	30,215	30,489	25,222	24,779	24,921	24,808	24,696	24,583
Commercial	106,155	106,759	107,195	109,583	104,893	104,544	104,244	103,267	102,300	101,348
Industrial & Agriculture	1,890	1,853	1,807	1,809	1,797	1,798	1,802	1,797	1,794	1,791
Total All Buildings	**138,823**	**138,546**	**139,218**	**141,881**	**131,912**	**131,121**	**130,967**	**129,873**	**128,789**	**127,723**
% of Forecast Sales	37.29%	37.02%	37.13%	37.46%	34.65%	34.44%	34.39%	34.10%	33.80%	33.51%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,256	2,924	2,738	2,719	2,166	2,178	2,167	2,156	2,145	2,134
Commercial	25,375	25,012	24,977	25,459	24,521	24,515	24,520	24,339	24,160	23,984
Industrial & Agricultural	339	337	333	335	335	335	336	335	335	334
Total All Buildings	**28,970**	**28,272**	**28,048**	**28,513**	**27,023**	**27,028**	**27,023**	**26,830**	**26,640**	**26,452**
% of Forecast Sales	42.79%	41.58%	41.19%	41.44%	39.05%	39.06%	39.05%	38.77%	38.44%	38.17%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	29,484	28,704	29,048	29,364	23,544	23,677	23,820	23,708	23,740	23,628
Commercial	88,333	88,549	89,738	91,873	88,557	88,380	88,250	89,960	89,133	88,320
Industrial & Agriculture	1,796	1,759	1,678	1,702	1,714	1,715	1,719	1,715	1,711	1,709
Total All Buildings	**119,613**	**119,011**	**120,464**	**122,938**	**113,814**	**113,772**	**113,790**	**115,383**	**114,584**	**113,657**
% of Forecast Sales	32.13%	31.80%	32.13%	32.45%	29.90%	29.88%	29.88%	30.29%	30.07%	29.82%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,640	1,517	1,530	1,540	990	1,003	993	983	974	964
Commercial	19,021	18,670	18,910	19,636	19,009	19,060	19,123	20,020	19,886	19,755
Industrial & Agriculture	322	319	313	318	320	320	321	320	319	319
Total All Buildings	**20,983**	**20,506**	**20,753**	**21,493**	**20,319**	**20,383**	**20,437**	**21,323**	**21,179**	**21,038**
% of Forecast Sales	30.99%	30.16%	30.47%	31.24%	29.36%	29.46%	29.53%	30.81%	30.56%	30.36%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,822	2,386	2,601	2,720	2,056	2,159	2,336	2,520	2,702	2,873
Commercial	7,089	7,501	7,904	8,487	8,485	9,204	9,943	10,715	11,461	12,092
Industrial & Agriculture	142	142	141	142	142	148	155	161	167	173
Total All Buildings	**10,053**	**10,029**	**10,646**	**11,349**	**10,683**	**11,511**	**12,434**	**13,396**	**14,330**	**15,137**
% of Forecast Sales	2.70%	2.68%	2.84%	3.00%	2.81%	3.02%	3.27%	3.52%	3.76%	3.97%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	320	259	274	274	190	199	207	214	220	225
Commercial	1,473	1,511	1,571	1,672	1,651	1,784	1,924	2,081	2,238	2,374
Industrial & Agriculture	25	25	26	26	26	28	29	30	31	32
Total All Buildings	**1,818**	**1,795**	**1,870**	**1,973**	**1,867**	**2,010**	**2,159**	**2,326**	**2,489**	**2,631**
% of Forecast Sales	2.69%	2.64%	2.75%	2.87%	2.70%	2.91%	3.12%	3.36%	3.59%	3.80%

Incremental Market Potential

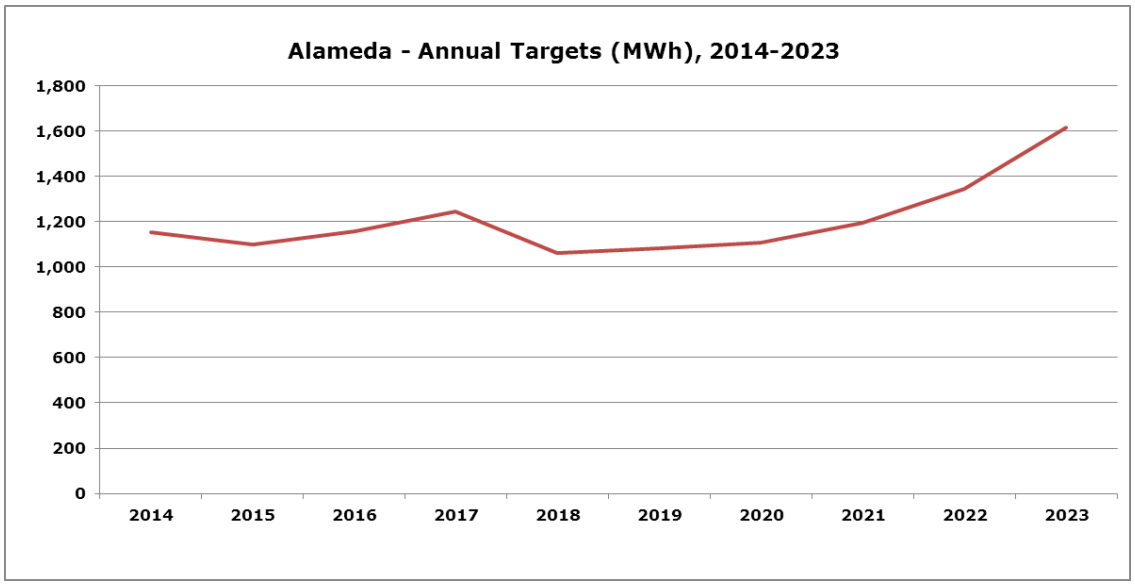
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	317	330	361	386	274	285	299	308	316	317
Commercial	694	712	732	763	716	736	754	801	814	821
Industrial & Agriculture	8	7	6	6	7	7	7	7	7	7
Total All Buildings	**1,019**	**1,049**	**1,099**	**1,155**	**997**	**1,028**	**1,059**	**1,116**	**1,137**	**1,145**
% of Forecast Sales	**0.27%**	**0.28%**	**0.29%**	**0.31%**	**0.26%**	**0.27%**	**0.28%**	**0.29%**	**0.30%**	**0.30%**
Utility Re-Participation	135	52	59	91	64	53	49	80	209	471
Total All Buildings (includes Re-participation)	**1,154**	**1,100**	**1,158**	**1,247**	**1,061**	**1,081**	**1,108**	**1,196**	**1,346**	**1,617**
% of Sales with Re-Participation	**0.31%**	**0.29%**	**0.31%**	**0.33%**	**0.28%**	**0.28%**	**0.29%**	**0.31%**	**0.35%**	**0.42%**
Codes & Standards	**954**	**1,305**	**1,549**	**1,573**	**2,333**	**2,320**	**2,261**	**2,212**	**1,979**	**1,782**
Incremental & Codes and Standard Effects as % of Forecast	**0.53%**	**0.63%**	**0.71%**	**0.72%**	**0.87%**	**0.88%**	**0.87%**	**0.87%**	**0.82%**	**0.77%**

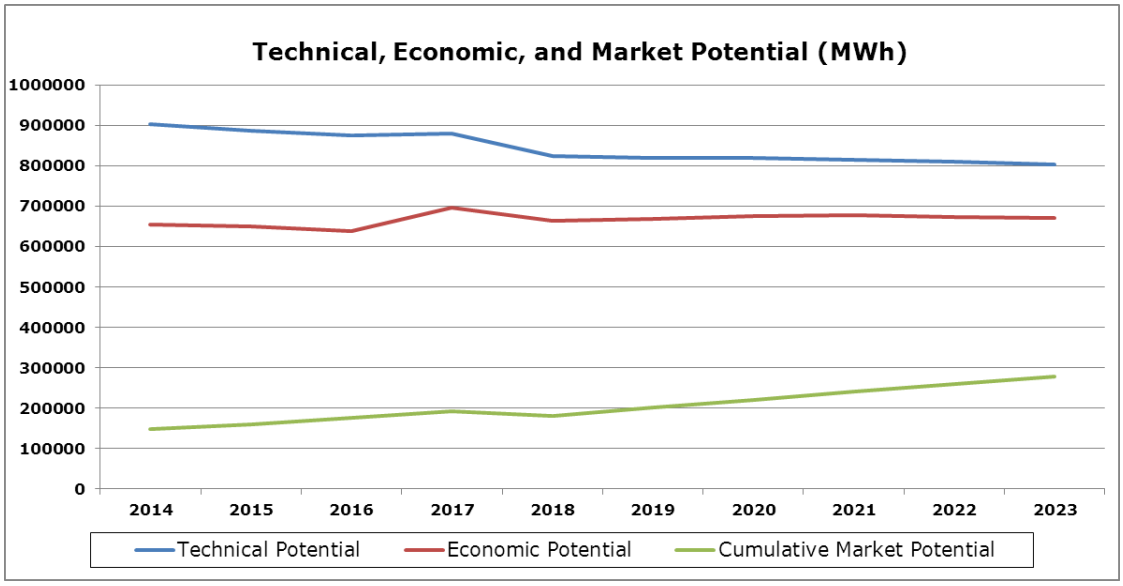
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	32	32	34	36	23	23	23	23	22	22
Commercial	130	128	129	139	130	135	142	163	171	177
Industrial & Agriculture	1	1	1	1	1	1	1	1	1	1
Total All Buildings	**163**	**161**	**165**	**176**	**154**	**160**	**166**	**187**	**194**	**200**
% of Forecast Sales	**0.24%**	**0.24%**	**0.24%**	**0.26%**	**0.22%**	**0.23%**	**0.24%**	**0.27%**	**0.28%**	**0.29%**
Utility Re-Participation	3	4	6	15	4	5	5	11	38	88
Total All Buildings (includes Re-participation)	**166**	**166**	**171**	**191**	**158**	**165**	**171**	**197**	**233**	**288**
% of Sales with Re-Participation	**0.25%**	**0.24%**	**0.25%**	**0.28%**	**0.23%**	**0.24%**	**0.25%**	**0.29%**	**0.34%**	**0.42%**
Codes & Standards	**309**	**241**	**318**	**330**	**435**	**426**	**416**	**407**	**369**	**356**
Incremental & Codes and Standard Effects as % of Forecast	**0.70%**	**0.59%**	**0.71%**	**0.74%**	**0.85%**	**0.85%**	**0.84%**	**0.86%**	**0.81%**	**0.80%**

ANAHEIM PUBLIC UTILITIES



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**24,026**	**24,425**	**24,228**	**25,742**	**24,585**	**24,842**	**25,254**	**25,480**	**25,567**	**25,204**
Total Energy Use (GWh):	2,434.42	2,452.81	2,460.91	2,465.95	2,471.21	2,476.47	2,481.99	2,486.98	2,492.23	2,492.23
Residential Sector Energy Use (GWH):	1,066.72	1,069.35	1,072.04	1,074.61	1,077.24	1,077.24	1,077.31	1,077.24	1,077.24	1,077.24
Commercial Sector Energy Use (GWH):	747.18	762.95	768.36	770.83	773.46	778.72	784.17	789.23	794.49	794.49
Industrial Sector Energy Use (GWH):	593.95	593.95	593.95	593.95	593.95	593.95	593.95	593.95	593.95	593.95
Target as Percent of Total	***0.99%***	***1.00%***	***0.98%***	***1.04%***	***0.99%***	***1.00%***	***1.02%***	***1.02%***	***1.03%***	***1.01%***
Electric Demand										
Adopted Target (MW)	**5.21**	**5.14**	**5.02**	**5.35**	**5.25**	**5.38**	**5.52**	**5.67**	**5.74**	**5.70**
Total Demand (MW):	565.00	570.00	573.00	576.00	579.00	582.00	585.00	588.00	590.00	591.00
Residential Demand (MW):	247.57	248.50	249.62	251.01	252.39	253.16	253.92	254.69	255.02	255.45
Commercial Demand (MW):	173.41	177.30	178.90	180.05	181.22	183.01	184.83	186.60	188.08	188.40
Industrial Demand (MW):	137.85	138.03	138.30	138.74	139.16	139.59	139.99	140.43	140.61	140.85
Target as Percent of Total	***0.92%***	***0.90%***	***0.88%***	***0.93%***	***0.91%***	***0.92%***	***0.94%***	***0.96%***	***0.97%***	***0.96%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	260,623	251,560	247,819	247,726	219,510	215,473	215,285	213,926	212,570	211,205
Commercial	552,131	547,755	542,890	548,987	521,050	521,410	522,200	517,445	513,331	508,220
Industrial & Agriculture	88,842	86,650	84,458	83,424	82,390	82,513	82,637	82,693	82,750	82,807
Total All Buildings	**901,597**	**885,965**	**875,167**	**880,137**	**822,950**	**819,396**	**820,122**	**814,065**	**808,652**	**802,233**
% of Forecast Sales	37.04%	36.12%	35.56%	35.69%	33.30%	33.09%	33.04%	32.73%	32.45%	32.19%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	106,623	95,191	88,219	88,145	83,640	83,885	84,014	83,766	83,545	83,281
Commercial	137,925	131,781	130,493	132,080	126,977	127,646	128,422	127,390	126,532	125,401
Industrial & Agricultural	15,930	15,737	15,544	15,459	15,374	15,397	15,420	15,431	15,441	15,452
Total All Buildings	**260,478**	**242,710**	**234,256**	**235,685**	**225,991**	**226,928**	**227,856**	**226,587**	**225,518**	**224,134**
% of Forecast Sales	46.10%	42.58%	40.88%	40.92%	39.03%	38.99%	38.95%	38.54%	38.22%	37.92%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	182,519	169,582	164,894	175,235	162,846	161,697	161,505	161,671	160,474	162,230
Commercial	396,509	404,562	397,690	444,198	423,595	427,885	433,568	435,099	432,455	428,720
Industrial & Agriculture	75,779	75,902	76,107	76,490	77,562	78,970	79,529	79,585	79,642	79,699
Total All Buildings	**654,808**	**650,047**	**638,691**	**695,923**	**664,003**	**668,552**	**674,601**	**676,356**	**672,572**	**670,648**
% of Forecast Sales	26.90%	26.50%	25.95%	28.22%	26.87%	27.00%	27.18%	27.20%	26.99%	26.91%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	68,008	62,051	54,533	58,765	54,003	53,878	53,655	57,582	57,357	57,479
Commercial	97,417	93,723	91,585	101,700	98,249	100,161	101,223	100,942	100,427	99,677
Industrial & Agriculture	14,140	14,163	14,202	14,273	14,473	14,736	14,840	14,851	14,861	14,872
Total All Buildings	**179,565**	**169,938**	**160,319**	**174,738**	**166,725**	**168,775**	**169,718**	**173,374**	**172,646**	**172,028**
% of Forecast Sales	31.78%	29.81%	27.98%	30.34%	28.80%	29.00%	29.01%	29.49%	29.26%	29.11%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	43,079	43,467	47,149	47,038	30,705	34,227	38,174	42,463	46,991	51,769
Commercial	75,674	84,035	92,024	102,881	105,528	118,096	130,986	143,796	156,595	169,019
Industrial & Agriculture	27,834	32,612	37,048	41,202	44,974	48,350	50,982	53,688	55,785	57,622
Total All Buildings	**146,587**	**160,115**	**176,221**	**191,120**	**181,208**	**200,673**	**220,141**	**239,948**	**259,371**	**278,410**
% of Forecast Sales	6.02%	6.53%	7.16%	7.75%	7.33%	8.10%	8.87%	9.65%	10.41%	11.17%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	10,954	7,791	8,576	9,177	8,311	9,822	11,495	13,379	15,349	17,418
Commercial	18,824	19,645	21,530	24,029	24,794	27,597	30,413	33,154	35,865	38,459
Industrial & Agriculture	5,173	6,072	6,906	7,685	8,392	9,022	9,513	10,018	10,410	10,752
Total All Buildings	**34,951**	**33,508**	**37,012**	**40,890**	**41,498**	**46,441**	**51,421**	**56,552**	**61,624**	**66,629**
% of Forecast Sales	6.19%	5.88%	6.46%	7.10%	7.17%	7.98%	8.79%	9.62%	10.44%	11.27%

Incremental Market Potential

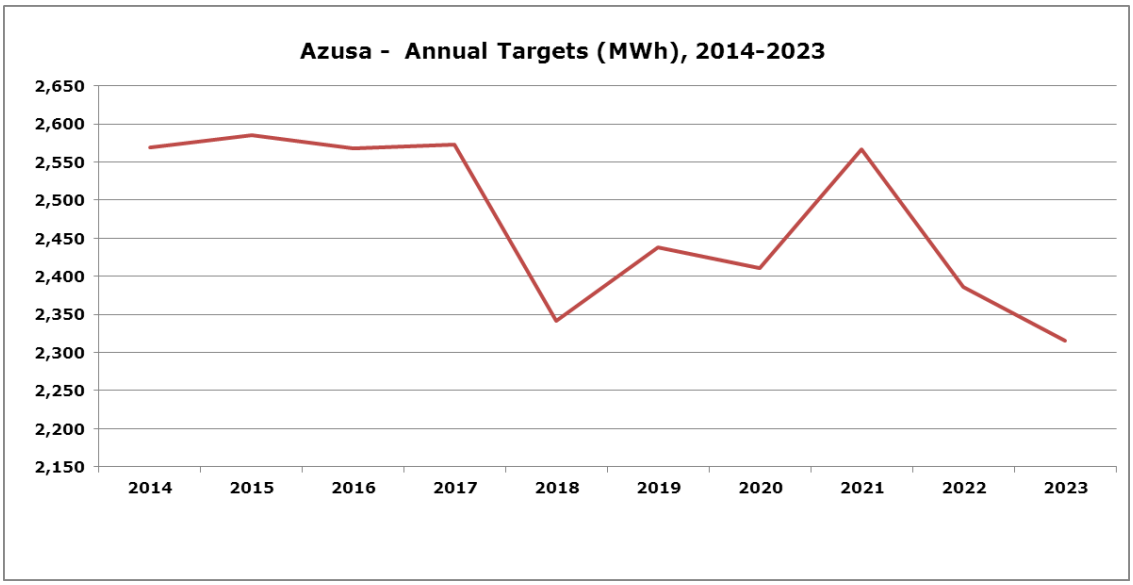
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6,853	7,232	7,562	8,453	8,095	8,416	8,786	9,136	9,397	9,578
Commercial	12,246	12,284	11,950	12,937	12,448	12,731	13,074	13,348	13,427	13,155
Industrial & Agriculture	4,927	4,908	4,716	4,352	4,042	3,695	3,394	2,995	2,743	2,471
Total All Buildings	**24,026**	**24,425**	**24,228**	**25,742**	**24,585**	**24,842**	**25,254**	**25,480**	**25,567**	**25,204**
% of Forecast Sales	**0.99%**	**1.00%**	**0.98%**	**1.04%**	**0.99%**	**1.00%**	**1.02%**	**1.02%**	**1.03%**	**1.01%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**24,026**	**24,425**	**24,228**	**25,742**	**24,585**	**24,842**	**25,254**	**25,480**	**25,567**	**25,204**
% of Sales with Re-Participation	**0.99%**	**1.00%**	**0.98%**	**1.04%**	**0.99%**	**1.00%**	**1.02%**	**1.02%**	**1.03%**	**1.01%**
Codes & Standards	**6,492**	**8,505**	**10,214**	**10,381**	**14,613**	**14,591**	**14,296**	**13,851**	**11,858**	**10,191**
Incremental & Codes and Standard Effects as % of Forecast	**1.25%**	**1.34%**	**1.40%**	**1.46%**	**1.59%**	**1.59%**	**1.59%**	**1.58%**	**1.50%**	**1.42%**

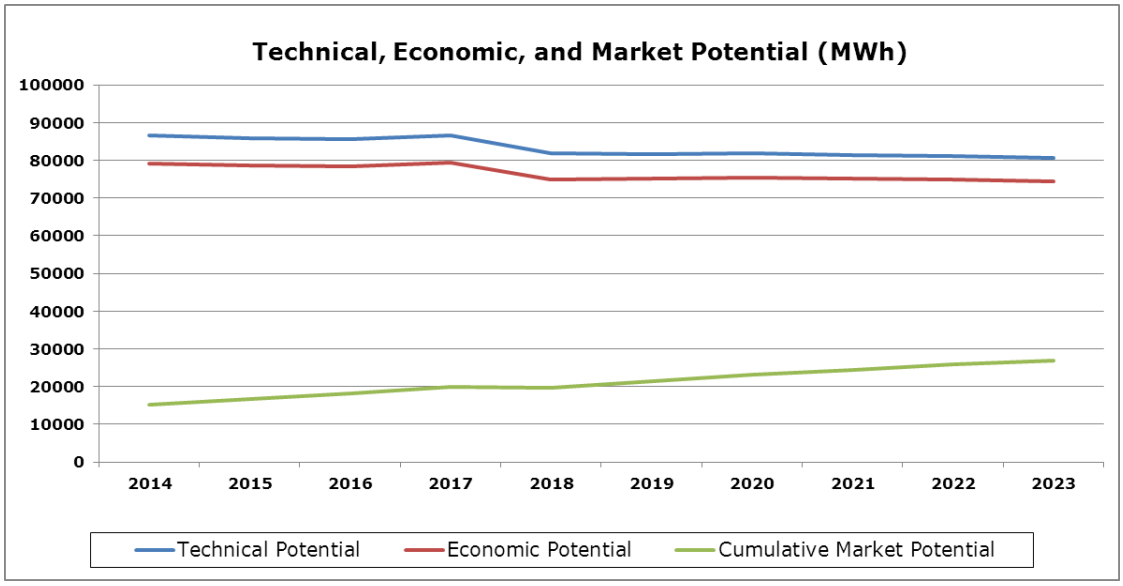
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,223	1,323	1,339	1,578	1,690	1,868	2,043	2,250	2,387	2,482
Commercial	3,064	2,904	2,802	2,956	2,808	2,824	2,842	2,857	2,846	2,754
Industrial & Agriculture	919	916	880	812	754	690	633	559	512	461
Total All Buildings	**5,206**	**5,142**	**5,020**	**5,346**	**5,252**	**5,381**	**5,518**	**5,666**	**5,745**	**5,696**
% of Forecast Sales	**0.92%**	**0.90%**	**0.88%**	**0.93%**	**0.91%**	**0.92%**	**0.94%**	**0.96%**	**0.97%**	**0.96%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**5,206**	**5,142**	**5,020**	**5,346**	**5,252**	**5,381**	**5,518**	**5,666**	**5,745**	**5,696**
% of Sales with Re-Participation	**0.92%**	**0.90%**	**0.88%**	**0.93%**	**0.91%**	**0.92%**	**0.94%**	**0.96%**	**0.97%**	**0.96%**
Codes & Standards	**4,344**	**3,544**	**4,467**	**4,548**	**5,310**	**5,262**	**5,199**	**4,788**	**3,827**	**3,284**
Incremental & Codes and Standard Effects as % of Forecast	**1.69%**	**1.52%**	**1.66%**	**1.72%**	**1.82%**	**1.83%**	**1.83%**	**1.78%**	**1.62%**	**1.52%**

AZUSA LIGHT & WATER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**2,570**	**2,585**	**2,568**	**2,573**	**2,342**	**2,438**	**2,411**	**2,567**	**2,386**	**2,316**
Total Energy Use (GWh):	250.20	252.70	255.22	257.78	260.35	262.96	265.59	268.24	270.93	273.63
Residential Sector Energy Use (GWH):	76.94	77.71	78.49	79.27	80.06	80.87	81.67	82.49	83.32	84.15
Commercial Sector Energy Use (GWH):	82.01	82.83	83.66	84.49	85.34	86.19	87.06	87.93	88.80	89.69
Industrial Sector Energy Use (GWH):	80.50	81.31	82.12	82.94	83.77	84.61	85.46	86.31	87.17	88.05
Target as Percent of Total	***1.03%***	***1.02%***	***1.01%***	***1.00%***	***0.90%***	***0.93%***	***0.91%***	***0.96%***	***0.88%***	***0.85%***
Electric Demand										
Adopted Target (MW)	**0.51**	**0.52**	**0.53**	**0.55**	**0.55**	**0.58**	**0.59**	**0.64**	**0.61**	**0.59**
Total Demand (MW):	67.64	68.32	69.00	69.69	70.39	71.09	71.80	72.52	73.24	73.98
Residential Demand (MW):	20.80	21.01	21.22	21.43	21.65	21.86	22.08	22.30	22.52	22.75
Commercial Demand (MW):	22.17	22.39	22.62	22.84	23.07	23.30	23.54	23.77	24.01	24.25
Industrial Demand (MW):	21.76	21.98	22.20	22.42	22.65	22.87	23.10	23.33	23.57	23.80
Target as Percent of Total	***0.75%***	***0.76%***	***0.77%***	***0.79%***	***0.78%***	***0.81%***	***0.83%***	***0.88%***	***0.84%***	***0.80%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	31,176	29,977	29,526	29,548	26,604	26,280	26,316	26,189	26,059	25,933
Commercial	43,127	43,695	44,158	45,203	43,417	43,256	43,206	42,833	42,480	42,134
Industrial & Agriculture	12,204	12,084	11,960	11,965	11,968	12,106	12,244	12,375	12,507	12,641
Total All Buildings	**86,507**	**85,755**	**85,645**	**86,715**	**81,989**	**81,641**	**81,767**	**81,398**	**81,046**	**80,708**
% of Forecast Sales	34.58%	33.94%	33.56%	33.64%	31.49%	31.05%	30.79%	30.34%	29.91%	29.49%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	11,248	9,948	9,140	9,084	8,811	8,838	8,849	8,827	8,805	8,784
Commercial	10,092	10,088	10,172	10,392	10,048	10,033	10,048	9,972	9,903	9,834
Industrial & Agricultural	2,205	2,206	2,207	2,220	2,233	2,259	2,285	2,309	2,334	2,359
Total All Buildings	**23,545**	**22,242**	**21,519**	**21,696**	**21,092**	**21,129**	**21,182**	**21,109**	**21,041**	**20,977**
% of Forecast Sales	34.81%	32.56%	31.19%	31.13%	29.97%	29.72%	29.50%	29.11%	28.73%	28.36%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	27,629	26,755	26,236	26,320	23,113	23,073	23,194	23,071	22,946	22,822
Commercial	39,707	40,098	40,588	41,410	39,924	40,067	40,051	39,711	39,390	39,077
Industrial & Agriculture	11,881	11,758	11,533	11,666	11,800	11,935	12,183	12,313	12,444	12,577
Total All Buildings	**79,217**	**78,611**	**78,357**	**79,396**	**74,837**	**75,075**	**75,428**	**75,094**	**74,780**	**74,476**
% of Forecast Sales	31.66%	31.11%	30.70%	30.80%	28.74%	28.55%	28.40%	27.99%	27.60%	27.22%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,060	6,376	5,615	5,606	5,300	5,293	5,271	5,256	5,238	5,221
Commercial	8,673	8,682	8,791	8,976	8,704	8,835	8,863	8,799	8,742	8,686
Industrial & Agriculture	2,145	2,146	2,152	2,177	2,202	2,227	2,273	2,298	2,322	2,347
Total All Buildings	**17,879**	**17,204**	**16,559**	**16,759**	**16,206**	**16,355**	**16,407**	**16,353**	**16,302**	**16,254**
% of Forecast Sales	26.43%	25.18%	24.00%	24.05%	23.02%	23.01%	22.85%	22.55%	22.26%	21.97%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,996	3,583	4,266	4,895	4,075	4,580	5,351	6,079	6,757	7,349
Commercial	8,256	8,689	9,186	9,823	9,934	10,633	11,313	11,698	12,216	12,642
Industrial & Agriculture	3,844	4,388	4,823	5,306	5,771	6,137	6,441	6,683	6,873	7,030
Total All Buildings	**15,096**	**16,661**	**18,275**	**20,025**	**19,780**	**21,350**	**23,105**	**24,459**	**25,845**	**27,020**
% of Forecast Sales	6.03%	6.59%	7.16%	7.77%	7.60%	8.12%	8.70%	9.12%	9.54%	9.87%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	689	623	736	924	1,012	1,277	1,564	1,863	2,120	2,346
Commercial	1,727	1,842	1,957	2,096	2,123	2,277	2,427	2,499	2,614	2,713
Industrial & Agriculture	692	800	891	985	1,077	1,145	1,202	1,247	1,282	1,312
Total All Buildings	**3,108**	**3,266**	**3,583**	**4,006**	**4,212**	**4,699**	**5,193**	**5,609**	**6,016**	**6,371**
% of Forecast Sales	4.59%	4.78%	5.19%	5.75%	5.98%	6.61%	7.23%	7.73%	8.21%	8.61%

Incremental Market Potential

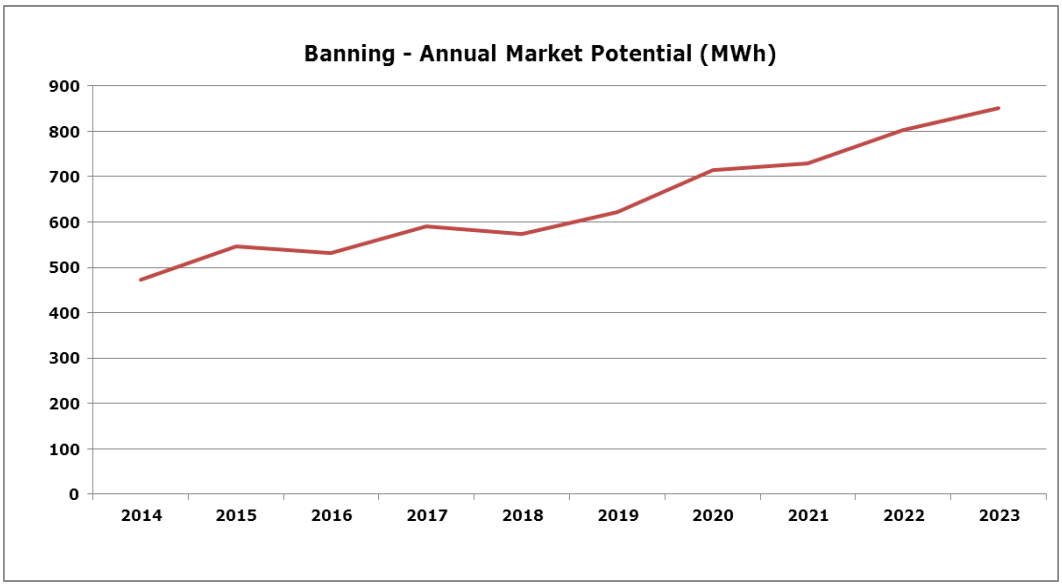
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	779	843	904	969	859	907	949	961	945	897
Commercial	924	904	886	869	806	786	761	750	686	633
Industrial & Agriculture	670	667	648	616	578	552	521	489	460	430
Total All Buildings	**2,373**	**2,414**	**2,438**	**2,455**	**2,242**	**2,245**	**2,231**	**2,200**	**2,091**	**1,960**
% of Forecast Sales	**0.95%**	**0.96%**	**0.96%**	**0.95%**	**0.86%**	**0.85%**	**0.84%**	**0.82%**	**0.77%**	**0.72%**
Utility Re-Participation	197	172	130	118	100	193	180	367	295	356
Total All Buildings (includes Re-participation)	**2,570**	**2,585**	**2,568**	**2,573**	**2,342**	**2,438**	**2,411**	**2,567**	**2,386**	**2,316**
% of Sales with Re-Participation	**1.03%**	**1.02%**	**1.01%**	**1.00%**	**0.90%**	**0.93%**	**0.91%**	**0.96%**	**0.88%**	**0.85%**
Codes & Standards	**570**	**779**	**902**	**904**	**1,267**	**1,265**	**1,236**	**1,190**	**1,057**	**914**
Incremental & Codes and Standard Effects as % of Forecast	**1.25%**	**1.33%**	**1.36%**	**1.35%**	**1.39%**	**1.41%**	**1.37%**	**1.40%**	**1.27%**	**1.18%**

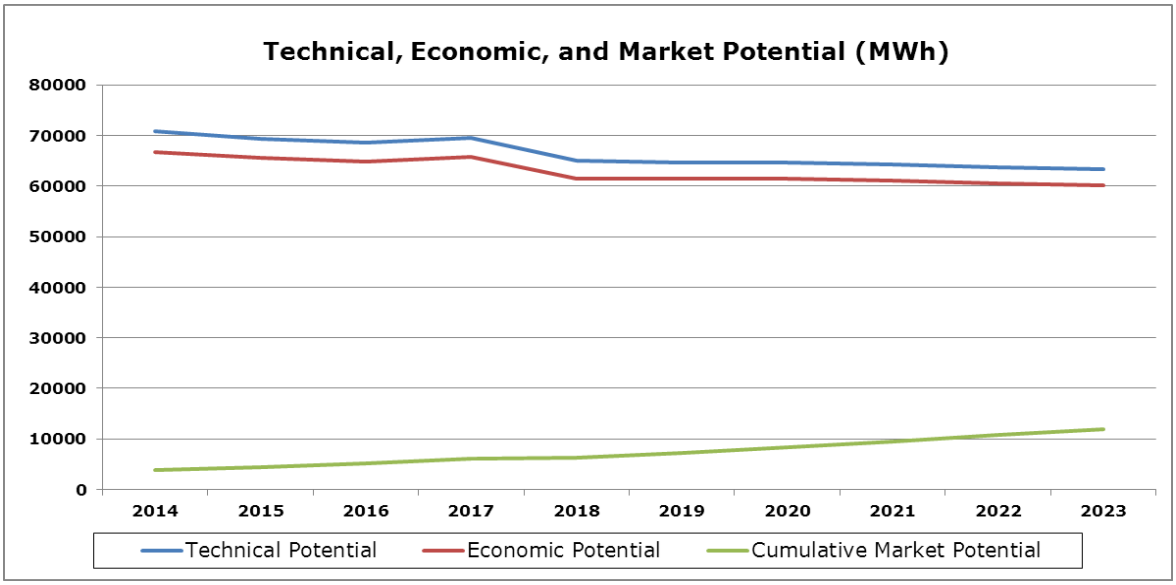
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	153	175	195	229	251	282	306	318	316	299
Commercial	210	202	194	187	171	167	162	162	148	138
Industrial & Agriculture	121	123	121	115	108	103	97	91	86	80
Total All Buildings	**483**	**500**	**510**	**530**	**530**	**552**	**565**	**571**	**550**	**516**
% of Forecast Sales	**0.71%**	**0.73%**	**0.74%**	**0.76%**	**0.75%**	**0.78%**	**0.79%**	**0.79%**	**0.75%**	**0.70%**
Utility Re-Participation	25	18	21	21	17	27	29	70	64	74
Total All Buildings (includes Re-participation)	**509**	**518**	**530**	**551**	**546**	**579**	**594**	**641**	**614**	**591**
% of Sales with Re-Participation	**0.75%**	**0.76%**	**0.77%**	**0.79%**	**0.78%**	**0.81%**	**0.83%**	**0.88%**	**0.84%**	**0.80%**
Codes & Standards	**277**	**361**	**444**	**450**	**494**	**490**	**485**	**443**	**355**	**293**
Incremental & Codes and Standard Effects as % of Forecast	**1.16%**	**1.29%**	**1.41%**	**1.44%**	**1.48%**	**1.50%**	**1.50%**	**1.50%**	**1.32%**	**1.19%**

CITY OF BANNING ELECTRIC UTILITY



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**472**	**546**	**532**	**591**	**573**	**621**	**715**	**730**	**802**	**852**
Total Energy Use (GWh):	148.52	155.34	162.54	170.14	178.17	186.65	195.59	205.03	214.99	225.43
Residential Sector Energy Use (GWH):	73.26	76.43	79.74	83.19	86.79	90.55	94.47	98.56	102.83	107.28
Commercial Sector Energy Use (GWH):	67.42	71.39	75.60	80.06	84.78	89.77	95.07	100.67	106.61	112.89
Industrial Sector Energy Use (GWH):	7.85	7.52	7.20	6.90	6.60	6.33	6.06	5.80	5.56	5.32
Target as Percent of Total	***0.32%***	***0.35%***	***0.33%***	***0.35%***	***0.32%***	***0.33%***	***0.37%***	***0.36%***	***0.37%***	***0.38%***
Electric Demand										
Adopted Target (MW)	**0.17**	**0.18**	**0.19**	**0.22**	**0.23**	**0.25**	**0.28**	**0.30**	**0.34**	**0.36**
Total Demand (MW):	48.97	51.12	53.38	55.77	58.28	60.93	63.71	66.65	69.73	72.96
Residential Demand (MW):	24.15	25.15	26.19	27.27	28.39	29.56	30.77	32.04	33.35	34.72
Commercial Demand (MW):	22.23	23.49	24.83	26.24	27.73	29.30	30.97	32.72	34.58	36.54
Industrial Demand (MW):	2.59	2.47	2.36	2.26	2.16	2.06	1.97	1.89	1.80	1.72
Target as Percent of Total	***0.35%***	***0.35%***	***0.36%***	***0.39%***	***0.40%***	***0.42%***	***0.44%***	***0.45%***	***0.48%***	***0.49%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	39,600	37,978	37,026	37,176	34,223	33,897	33,978	33,805	33,632	33,466
Commercial	30,217	30,493	30,702	31,433	30,107	30,058	30,033	29,748	29,501	29,201
Industrial & Agriculture	1,033	958	888	837	789	757	726	696	667	640
Total All Buildings	**70,850**	**69,429**	**68,616**	**69,446**	**65,119**	**64,712**	**64,738**	**64,249**	**63,799**	**63,306**
% of Forecast Sales	47.70%	44.70%	42.22%	40.82%	36.55%	34.67%	33.10%	31.34%	29.68%	28.08%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	18,065	16,276	15,053	15,118	14,884	14,949	15,002	14,972	14,941	14,912
Commercial	6,803	6,750	6,765	6,903	6,641	6,635	6,636	6,578	6,530	6,467
Industrial & Agricultural	183	173	163	155	147	141	136	130	125	119
Total All Buildings	**25,051**	**23,199**	**21,981**	**22,176**	**21,672**	**21,725**	**21,774**	**21,680**	**21,595**	**21,498**
% of Forecast Sales	51.16%	45.38%	41.18%	39.76%	37.19%	35.66%	34.17%	32.53%	30.97%	29.46%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	37,878	36,652	35,794	36,055	32,884	32,888	32,968	32,796	32,623	32,459
Commercial	27,877	28,022	28,291	28,871	27,800	27,775	27,775	27,514	27,289	27,013
Industrial & Agriculture	992	919	820	786	755	724	713	695	667	639
Total All Buildings	**66,747**	**65,594**	**64,904**	**65,712**	**61,438**	**61,387**	**61,456**	**61,005**	**60,579**	**60,110**
% of Forecast Sales	44.94%	42.23%	39.93%	38.62%	34.48%	32.89%	31.42%	29.75%	28.18%	26.66%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	15,560	14,544	13,526	13,594	13,356	13,414	13,464	13,435	13,402	13,376
Commercial	5,776	5,735	5,773	5,892	5,692	5,696	5,707	5,658	5,620	5,567
Industrial & Agriculture	176	165	153	147	141	135	133	130	124	119
Total All Buildings	**21,511**	**20,445**	**19,452**	**19,633**	**19,188**	**19,245**	**19,304**	**19,223**	**19,147**	**19,062**
% of Forecast Sales	43.93%	40.00%	36.44%	35.20%	32.92%	31.59%	30.30%	28.84%	27.46%	26.13%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,093	2,403	2,894	3,530	3,582	4,247	5,060	5,935	6,835	7,754
Commercial	1,711	1,925	2,147	2,402	2,572	2,856	3,126	3,431	3,737	4,036
Industrial & Agriculture	61	79	96	112	127	141	155	168	178	187
Total All Buildings	**3,865**	**4,407**	**5,136**	**6,044**	**6,281**	**7,244**	**8,340**	**9,534**	**10,749**	**11,977**
% of Forecast Sales	2.60%	2.84%	3.16%	3.55%	3.53%	3.88%	4.26%	4.65%	5.00%	5.31%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	878	936	1,145	1,446	1,717	2,085	2,488	2,921	3,367	3,824
Commercial	237	277	319	367	398	450	501	557	613	668
Industrial & Agriculture	11	14	18	21	24	26	29	31	33	35
Total All Buildings	**1,126**	**1,227**	**1,482**	**1,834**	**2,138**	**2,562**	**3,018**	**3,509**	**4,012**	**4,527**
% of Forecast Sales	2.30%	2.40%	2.78%	3.29%	3.67%	4.20%	4.74%	5.27%	5.75%	6.20%

Incremental Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	482	550	619	700	702	779	853	917	965	988
Commercial	233	247	261	278	278	293	305	311	313	308
Industrial & Agriculture	20	20	19	17	16	15	14	13	12	12
Total All Buildings	**735**	**816**	**899**	**995**	**997**	**1,086**	**1,172**	**1,242**	**1,290**	**1,309**
% of Forecast Sales	**0.50%**	**0.53%**	**0.55%**	**0.59%**	**0.56%**	**0.58%**	**0.60%**	**0.61%**	**0.60%**	**0.58%**
Utility Re-Participation	75	99	37	39	23	19	57	19	48	58
Total All Buildings (includes Re-participation)	**810**	**916**	**935**	**1,034**	**1,020**	**1,105**	**1,229**	**1,260**	**1,339**	**1,367**
% of Sales with Re-Participation	**0.55%**	**0.59%**	**0.58%**	**0.61%**	**0.57%**	**0.59%**	**0.63%**	**0.61%**	**0.62%**	**0.61%**
Codes & Standards	**519**	**780**	**936**	**933**	**1,294**	**1,294**	**1,266**	**1,208**	**1,065**	**907**
Incremental & Codes and Standard Effects as % of Forecast	**0.90%**	**1.09%**	**1.15%**	**1.16%**	**1.30%**	**1.29%**	**1.28%**	**1.20%**	**1.12%**	**1.01%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	228	253	274	309	337	372	407	439	464	479
Commercial	48	49	51	53	52	54	55	56	57	56
Industrial & Agriculture	4	4	3	3	3	3	3	2	2	2
Total All Buildings	**280**	**306**	**328**	**364**	**391**	**429**	**465**	**498**	**523**	**538**
% of Forecast Sales	**0.57%**	**0.60%**	**0.62%**	**0.65%**	**0.67%**	**0.70%**	**0.73%**	**0.75%**	**0.75%**	**0.74%**
Utility Re-Participation	13	0	2	6	6	2	6	3	17	21
Total All Buildings (includes Re-participation)	**292**	**306**	**331**	**371**	**398**	**431**	**472**	**500**	**540**	**559**
% of Sales with Re-Participation	**0.60%**	**0.60%**	**0.62%**	**0.66%**	**0.68%**	**0.71%**	**0.74%**	**0.75%**	**0.77%**	**0.77%**
Codes & Standards	**283**	**437**	**554**	**557**	**596**	**591**	**586**	**521**	**388**	**315**
Incremental & Codes and Standard Effects as % of Forecast	**1.18%**	**1.45%**	**1.66%**	**1.66%**	**1.70%**	**1.68%**	**1.66%**	**1.53%**	**1.33%**	**1.20%**

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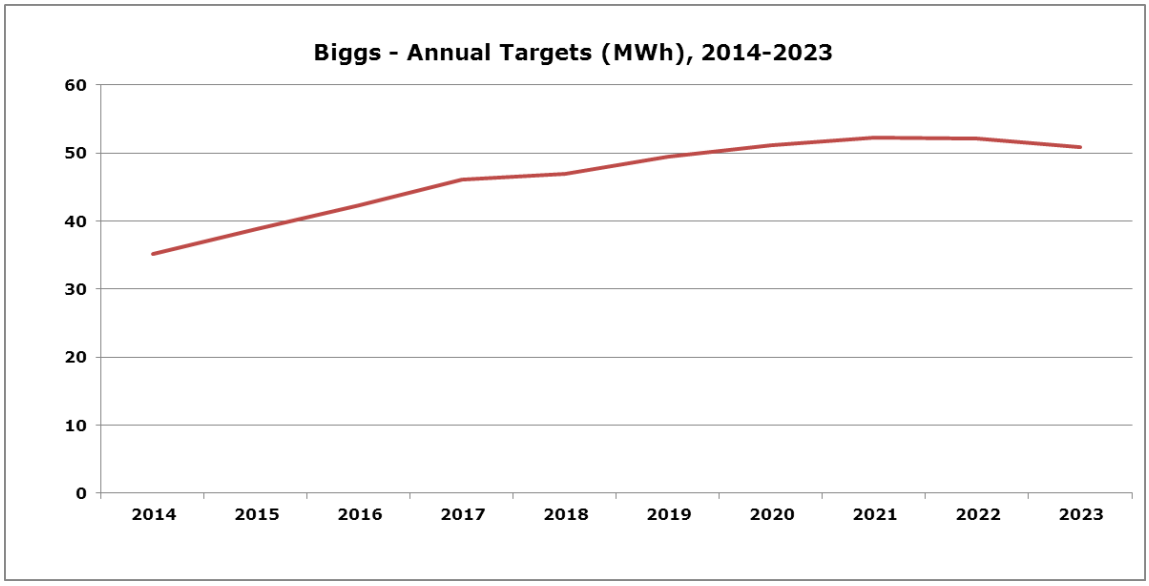
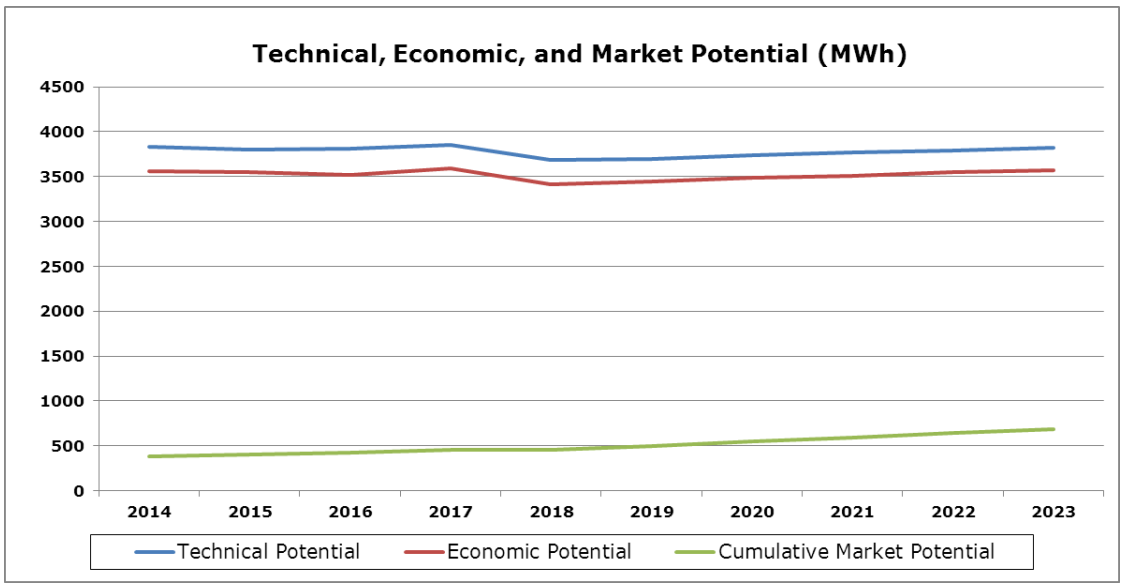


Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**35**	**39**	**42**	**46**	**47**	**49**	**51**	**52**	**52**	**51**
Total Energy Use (GWh):	17.01	17.06	17.12	17.17	17.23	17.29	17.34	17.40	17.46	17.51
Residential Sector Energy Use (GWH):	3.89	3.76	3.64	3.53	3.41	3.30	3.20	3.10	3.00	2.90
Commercial Sector Energy Use (GWH):	1.49	1.48	1.46	1.44	1.43	1.41	1.40	1.38	1.37	1.36
Industrial Sector Energy Use (GWH):	11.68	11.91	12.15	12.38	12.63	12.88	13.13	13.39	13.65	13.92
Target as Percent of Total	***0.21%***	***0.23%***	***0.25%***	***0.27%***	***0.27%***	***0.29%***	***0.30%***	***0.30%***	***0.30%***	***0.29%***
Electric Demand										
Adopted Target (MW)	**0.04**	**0.04**	**0.04**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Total Demand (MW):	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Residential Demand (MW):	0.91	0.88	0.85	0.82	0.79	0.76	0.74	0.71	0.69	0.66
Commercial Demand (MW):	0.35	0.35	0.34	0.34	0.33	0.33	0.32	0.32	0.31	0.31
Industrial Demand (MW):	2.75	2.79	2.84	2.88	2.93	2.98	3.03	3.08	3.13	3.18
Target as Percent of Total	***0.14%***	***0.15%***	***0.15%***	***0.16%***	***0.16%***	***0.16%***	***0.16%***	***0.17%***	***0.17%***	***0.17%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,220	1,173	1,162	1,167	1,003	980	983	975	967	960
Commercial	766	776	785	807	774	772	769	762	755	748
Industrial & Agriculture	1,842	1,851	1,859	1,883	1,907	1,947	1,988	2,028	2,070	2,112
Total All Buildings	**3,827**	**3,799**	**3,806**	**3,857**	**3,684**	**3,699**	**3,740**	**3,766**	**3,792**	**3,819**
% of Forecast Sales	22.50%	22.26%	22.23%	22.46%	21.38%	21.40%	21.56%	21.64%	21.72%	21.81%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	297	257	245	246	233	235	237	236	235	234
Commercial	186	185	187	191	186	186	186	185	183	182
Industrial & Agricultural	336	340	344	350	356	363	371	378	386	394
Total All Buildings	**819**	**782**	**776**	**788**	**774**	**784**	**794**	**799**	**804**	**810**
% of Forecast Sales	20.47%	19.54%	19.39%	19.70%	19.36%	19.61%	19.86%	19.98%	20.11%	20.24%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,027	997	972	974	788	781	780	772	765	757
Commercial	712	723	738	757	729	727	725	718	712	705
Industrial & Agriculture	1,819	1,828	1,806	1,858	1,897	1,937	1,978	2,018	2,070	2,112
Total All Buildings	**3,559**	**3,548**	**3,515**	**3,589**	**3,414**	**3,445**	**3,482**	**3,508**	**3,546**	**3,574**
% of Forecast Sales	20.93%	20.79%	20.54%	20.90%	19.82%	19.93%	20.08%	20.16%	20.31%	20.41%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	90	78	54	53	37	37	36	35	34	33
Commercial	156	154	158	162	158	159	159	158	157	156
Industrial & Agriculture	331	336	337	347	354	361	369	377	386	394
Total All Buildings	**577**	**567**	**548**	**562**	**549**	**557**	**564**	**569**	**577**	**583**
% of Forecast Sales	14.42%	14.18%	13.71%	14.06%	13.73%	13.92%	14.10%	14.23%	14.42%	14.57%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	60	64	76	89	78	91	110	129	148	165
Commercial	120	118	114	113	104	107	110	112	114	114
Industrial & Agriculture	206	221	236	257	278	304	331	355	381	407
Total All Buildings	**387**	**402**	**426**	**460**	**460**	**502**	**551**	**596**	**643**	**685**
% of Forecast Sales	2.27%	2.36%	2.49%	2.68%	2.67%	2.90%	3.18%	3.42%	3.68%	3.91%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	13	10	10	10	8	8	8	9	9	10
Commercial	27	26	25	25	23	24	24	25	26	25
Industrial & Agriculture	35	39	43	47	52	57	62	66	71	76
Total All Buildings	**75**	**74**	**77**	**82**	**82**	**88**	**95**	**100**	**106**	**111**
% of Forecast Sales	1.88%	1.86%	1.93%	2.05%	2.06%	2.21%	2.36%	2.50%	2.65%	2.78%

Incremental Market Potential

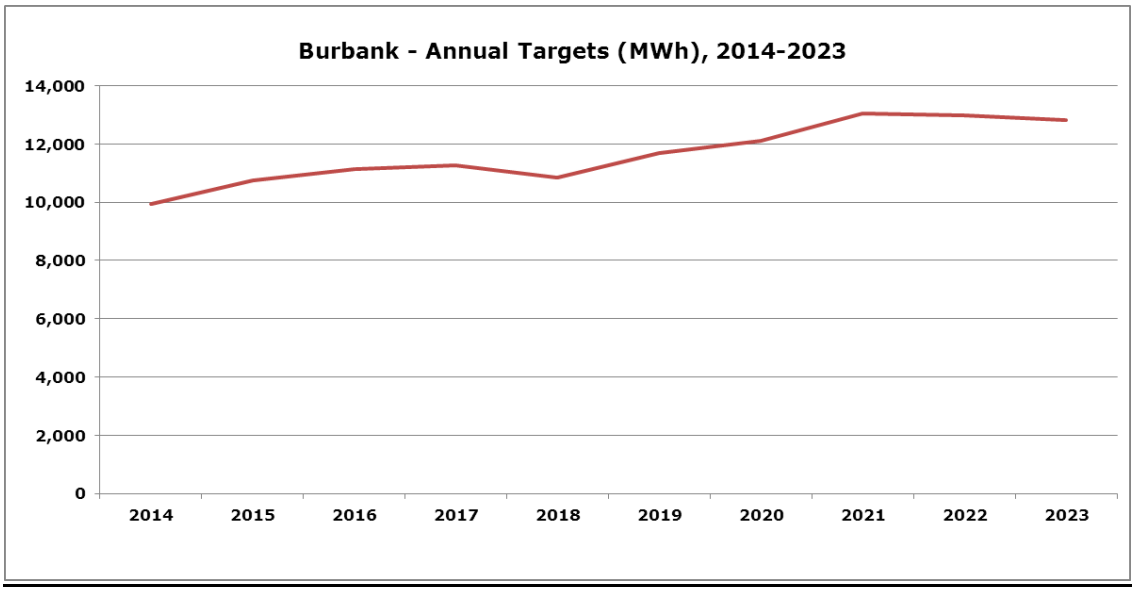
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	8	10	13	16	16	19	20	21	21	19
Commercial	3	3	3	3	3	3	3	3	3	2
Industrial & Agriculture	24	25	26	27	28	28	28	28	29	29
Total All Buildings	**35**	**39**	**42**	**46**	**47**	**49**	**51**	**52**	**52**	**51**
% of Forecast Sales	**0.21%**	**0.23%**	**0.25%**	**0.27%**	**0.27%**	**0.29%**	**0.30%**	**0.30%**	**0.30%**	**0.29%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**35**	**39**	**42**	**46**	**47**	**49**	**51**	**52**	**52**	**51**
% of Sales with Re-Participation	**0.21%**	**0.23%**	**0.25%**	**0.27%**	**0.27%**	**0.29%**	**0.30%**	**0.30%**	**0.30%**	**0.29%**
Codes & Standards	**26**	**34**	**37**	**35**	**59**	**58**	**55**	**52**	**46**	**36**
Incremental & Codes and Standard Effects as % of Forecast	**0.36%**	**0.43%**	**0.46%**	**0.47%**	**0.61%**	**0.62%**	**0.61%**	**0.60%**	**0.56%**	**0.50%**

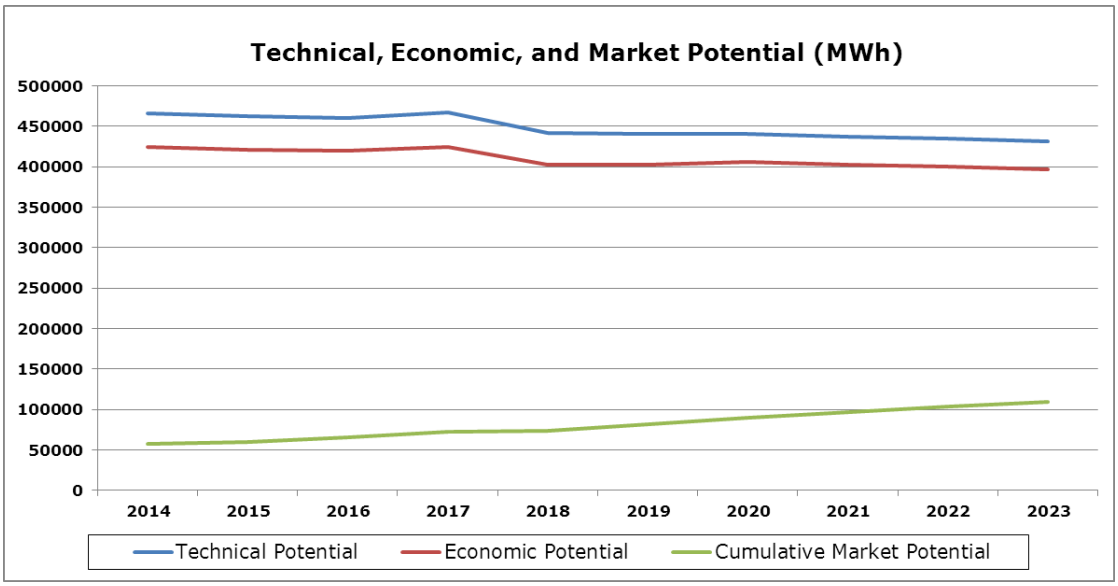
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	1	1	0	1	1	1	1	1
Commercial	1	1	1	1	1	1	1	1	1	1
Industrial & Agriculture	4	5	5	5	5	5	5	5	5	5
Total All Buildings	**6**	**6**	**6**	**6**	**6**	**6**	**7**	**7**	**7**	**7**
% of Forecast Sales	**0.14%**	**0.15%**	**0.15%**	**0.16%**	**0.16%**	**0.16%**	**0.16%**	**0.17%**	**0.17%**	**0.17%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**6**	**6**	**6**	**6**	**6**	**6**	**7**	**7**	**7**	**7**
% of Sales with Re-Participation	**0.14%**	**0.15%**	**0.15%**	**0.16%**	**0.16%**	**0.16%**	**0.16%**	**0.17%**	**0.17%**	**0.17%**
Codes & Standards	**14**	**18**	**20**	**20**	**22**	**22**	**21**	**18**	**11**	**8**
Incremental & Codes and Standard Effects as % of Forecast	**0.48%**	**0.59%**	**0.64%**	**0.65%**	**0.71%**	**0.70%**	**0.69%**	**0.61%**	**0.45%**	**0.36%**

BURBANK WATER & POWER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**9,947**	**10,739**	**11,124**	**11,281**	**10,852**	**11,677**	**12,111**	**13,037**	**12,977**	**12,829**
Total Energy Use (GWh):	1,246.26	1,271.62	1,283.26	1,296.09	1,309.05	1,322.14	1,335.37	1,348.72	1,362.21	1,375.83
Residential Sector Energy Use (GWH):	293.92	299.84	302.61	305.63	308.69	311.77	314.89	318.04	321.22	324.43
Commercial Sector Energy Use (GWH):	912.67	931.25	939.77	949.17	958.66	968.25	977.93	987.71	997.59	1,007.56
Industrial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.80%***	***0.84%***	***0.87%***	***0.87%***	***0.83%***	***0.88%***	***0.91%***	***0.97%***	***0.95%***	***0.93%***
Electric Demand										
Adopted Target (MW)	**1.75**	**1.79**	**1.83**	**1.89**	**1.85**	**2.04**	**2.14**	**2.45**	**2.48**	**2.37**
Total Demand (MW):	315.93	319.33	322.72	326.12	329.51	332.91	336.30	339.70	343.09	346.49
Residential Demand (MW):	74.51	75.30	76.10	76.90	77.70	78.50	79.30	80.10	80.90	81.70
Commercial Demand (MW):	231.36	233.85	236.34	238.82	241.31	243.80	246.28	248.77	251.26	253.74
Industrial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.55%***	***0.56%***	***0.57%***	***0.58%***	***0.56%***	***0.61%***	***0.64%***	***0.72%***	***0.72%***	***0.68%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	93,250	88,899	86,675	86,097	77,861	77,136	77,270	76,905	76,541	76,184
Commercial	372,736	373,378	373,786	380,665	363,628	363,392	363,847	360,842	357,899	355,038
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**465,986**	**462,276**	**460,462**	**466,763**	**441,489**	**440,528**	**441,117**	**437,747**	**434,440**	**431,221**
% of Forecast Sales	37.39%	36.35%	35.88%	36.01%	33.73%	33.32%	33.03%	32.46%	31.89%	31.34%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	31,188	26,871	24,350	24,147	23,318	23,399	23,429	23,372	23,319	23,252
Commercial	89,847	85,939	85,828	87,316	84,014	84,250	84,676	84,136	83,613	83,108
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**121,035**	**112,810**	**110,178**	**111,464**	**107,332**	**107,649**	**108,105**	**107,508**	**106,933**	**106,360**
% of Forecast Sales	38.31%	35.33%	34.14%	34.18%	32.57%	32.34%	32.15%	31.65%	31.17%	30.70%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	81,069	78,424	76,444	76,068	67,079	67,113	67,147	66,796	67,002	66,655
Commercial	343,445	342,586	343,989	348,606	335,307	335,369	338,489	335,751	333,073	330,473
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**424,514**	**421,010**	**420,433**	**424,674**	**402,386**	**402,481**	**405,636**	**402,547**	**400,075**	**397,128**
% of Forecast Sales	34.06%	33.11%	32.76%	32.77%	30.74%	30.44%	30.38%	29.85%	29.37%	28.86%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	18,819	16,970	15,013	14,968	14,052	14,035	13,988	13,938	13,888	13,842
Commercial	76,335	72,614	72,826	73,963	71,582	71,949	73,679	73,255	72,846	72,455
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**95,154**	**89,584**	**87,839**	**88,931**	**85,634**	**85,984**	**87,667**	**87,193**	**86,734**	**86,297**
% of Forecast Sales	30.12%	28.05%	27.22%	27.27%	25.99%	25.83%	26.07%	25.67%	25.28%	24.91%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	13,807	12,252	13,210	14,771	13,627	15,409	17,706	20,144	22,532	24,757
Commercial	40,805	45,181	49,798	55,296	58,123	63,953	69,639	74,194	78,653	82,712
Industrial & Agriculture	2,544	2,537	2,529	2,526	2,522	2,522	2,522	2,522	2,522	2,522
Total All Buildings	**57,156**	**59,970**	**65,537**	**72,593**	**74,272**	**81,884**	**89,867**	**96,861**	**103,707**	**109,991**
% of Forecast Sales	4.59%	4.72%	5.11%	5.60%	5.67%	6.19%	6.73%	7.18%	7.61%	7.99%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,603	2,307	2,258	2,701	2,938	3,588	4,334	5,144	5,938	6,693
Commercial	11,859	11,013	11,973	13,086	13,632	14,809	15,985	16,936	17,896	18,786
Industrial & Agriculture	473	472	471	471	471	471	471	471	471	471
Total All Buildings	**15,935**	**13,792**	**14,702**	**16,259**	**17,041**	**18,867**	**20,790**	**22,551**	**24,304**	**25,950**
% of Forecast Sales	5.04%	4.32%	4.56%	4.99%	5.17%	5.67%	6.18%	6.64%	7.08%	7.49%

Incremental Market Potential

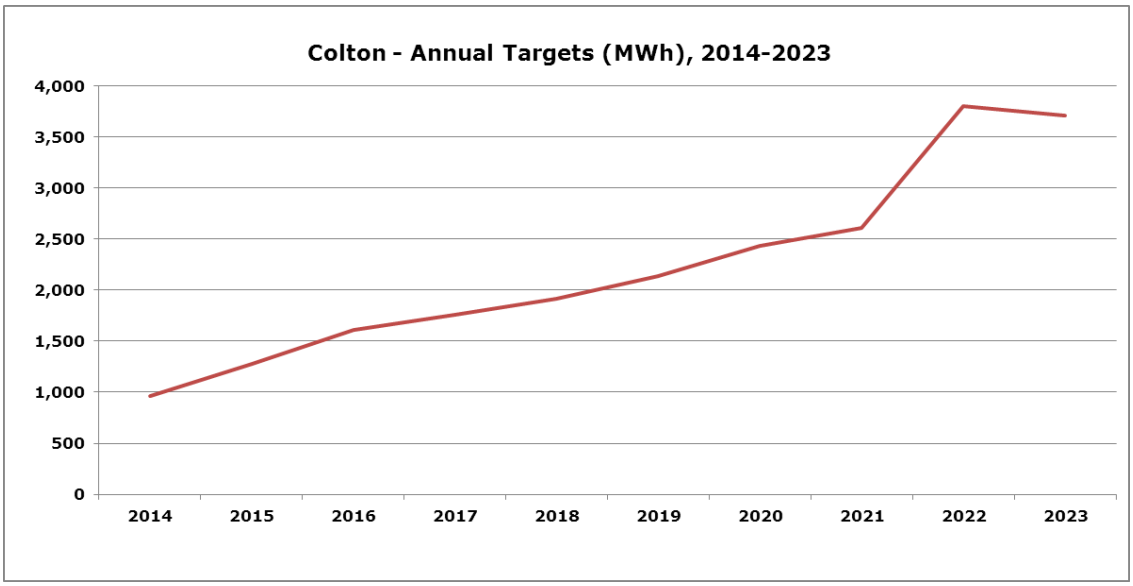
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,306	3,520	3,894	4,234	4,296	4,632	4,934	5,156	5,261	5,199
Commercial	5,955	6,092	6,192	6,310	6,081	6,137	6,008	5,554	5,238	4,791
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**9,261**	**9,612**	**10,086**	**10,543**	**10,377**	**10,768**	**10,942**	**10,710**	**10,500**	**9,990**
% of Forecast Sales	**0.74%**	**0.76%**	**0.79%**	**0.81%**	**0.79%**	**0.81%**	**0.82%**	**0.79%**	**0.77%**	**0.73%**
Utility Re-Participation	686	1,127	1,038	738	475	909	1,169	2,327	2,477	2,839
Total All Buildings (includes Re-participation)	**9,947**	**10,739**	**11,124**	**11,281**	**10,852**	**11,677**	**12,111**	**13,037**	**12,977**	**12,829**
% of Sales with Re-Participation	**0.80%**	**0.84%**	**0.87%**	**0.87%**	**0.83%**	**0.88%**	**0.91%**	**0.97%**	**0.95%**	**0.93%**
Codes & Standards	**3,322**	**4,341**	**5,275**	**5,479**	**7,142**	**7,091**	**6,967**	**6,801**	**5,781**	**5,160**
Incremental & Codes and Standard Effects as % of Forecast	**1.01%**	**1.10%**	**1.20%**	**1.24%**	**1.34%**	**1.35%**	**1.34%**	**1.30%**	**1.20%**	**1.10%**

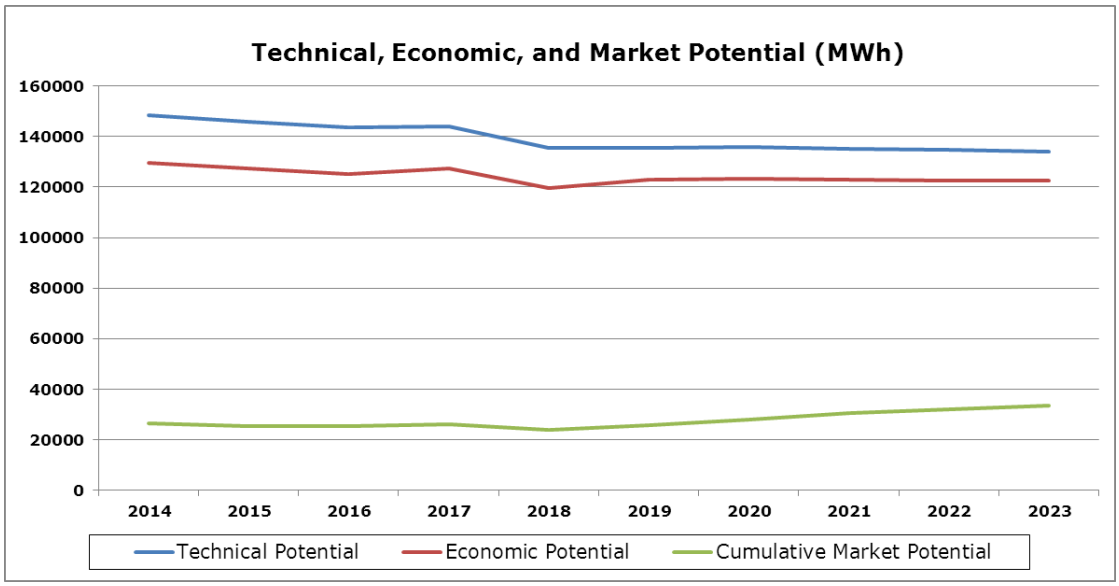
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	285	338	395	492	565	671	769	842	873	850
Commercial	1,379	1,313	1,293	1,279	1,215	1,221	1,221	1,164	1,105	1,020
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**1,664**	**1,651**	**1,688**	**1,771**	**1,780**	**1,892**	**1,989**	**2,006**	**1,978**	**1,870**
% of Forecast Sales	**0.53%**	**0.52%**	**0.52%**	**0.54%**	**0.54%**	**0.57%**	**0.59%**	**0.59%**	**0.58%**	**0.54%**
Utility Re-Participation	83	139	147	117	71	144	153	449	506	495
Total All Buildings (includes Re-participation)	**1,747**	**1,790**	**1,835**	**1,888**	**1,851**	**2,036**	**2,143**	**2,454**	**2,484**	**2,365**
% of Sales with Re-Participation	**0.55%**	**0.56%**	**0.57%**	**0.58%**	**0.56%**	**0.61%**	**0.64%**	**0.72%**	**0.72%**	**0.68%**
Codes & Standards	**2,590**	**1,459**	**1,776**	**1,843**	**2,118**	**2,097**	**2,076**	**1,961**	**1,632**	**1,424**
Incremental & Codes and Standard Effects as % of Forecast	**1.35%**	**0.97%**	**1.07%**	**1.11%**	**1.18%**	**1.20%**	**1.21%**	**1.17%**	**1.05%**	**0.95%**

COLTON ELECTRIC UTILITY



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**966**	**1,273**	**1,614**	**1,759**	**1,911**	**2,137**	**2,435**	**2,610**	**3,804**	**3,712**
Total Energy Use (GWh):	343.48	344.64	345.81	346.98	348.15	349.33	350.51	351.69	352.88	354.08
Residential Sector Energy Use (GWH):	90.74	91.05	91.35	91.66	91.97	92.28	92.60	92.91	93.22	93.54
Commercial Sector Energy Use (GWH):	65.45	65.67	65.89	66.12	66.34	66.56	66.79	67.01	67.24	67.47
Industrial Sector Energy Use (GWH):	181.14	181.76	182.37	182.99	183.61	184.23	184.85	185.48	186.10	186.73
Target as Percent of Total	***0.28%***	***0.37%***	***0.47%***	***0.51%***	***0.55%***	***0.61%***	***0.69%***	***0.74%***	***1.08%***	***1.05%***
Electric Demand										
Adopted Target (MW)	**0.25**	**0.32**	**0.38**	**0.48**	**0.56**	**0.66**	**0.76**	**0.83**	**1.14**	**1.13**
Total Demand (MW):	86.67	86.97	87.26	87.56	87.85	88.15	88.45	88.75	89.05	89.35
Residential Demand (MW):	22.90	22.97	23.05	23.13	23.21	23.29	23.37	23.45	23.52	23.60
Commercial Demand (MW):	16.52	16.57	16.63	16.68	16.74	16.80	16.85	16.91	16.97	17.03
Industrial Demand (MW):	45.71	45.86	46.02	46.18	46.33	46.49	46.65	46.80	46.96	47.12
Target as Percent of Total	***0.29%***	***0.36%***	***0.44%***	***0.55%***	***0.64%***	***0.75%***	***0.86%***	***0.94%***	***1.28%***	***1.27%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	48,495	46,723	45,865	45,951	41,855	41,346	41,390	41,192	40,996	40,807
Commercial	71,274	70,596	69,798	70,219	66,055	66,116	66,375	65,861	65,371	64,899
Industrial & Agriculture	28,784	28,397	28,007	27,877	27,746	27,878	28,011	28,123	28,236	28,350
Total All Buildings	**148,553**	**145,716**	**143,670**	**144,048**	**135,655**	**135,341**	**135,775**	**135,177**	**134,604**	**134,055**
% of Forecast Sales	43.25%	42.28%	41.55%	41.52%	38.96%	38.74%	38.74%	38.44%	38.14%	37.86%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	22,037	19,737	18,199	18,247	17,949	18,015	18,078	18,039	18,001	17,965
Commercial	17,158	16,822	16,707	16,866	16,112	16,208	16,353	16,248	16,149	16,054
Industrial & Agricultural	5,225	5,201	5,177	5,177	5,177	5,202	5,227	5,248	5,269	5,290
Total All Buildings	**44,421**	**41,760**	**40,083**	**40,290**	**39,238**	**39,425**	**39,658**	**39,535**	**39,420**	**39,310**
% of Forecast Sales	51.25%	48.02%	45.94%	46.02%	44.66%	44.73%	44.84%	44.55%	44.27%	44.00%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	37,122	35,511	34,880	37,244	32,693	35,752	35,725	35,538	35,351	35,164
Commercial	64,262	63,993	63,209	63,085	59,791	59,919	60,242	59,794	59,368	59,508
Industrial & Agriculture	28,278	27,890	26,975	27,104	27,234	27,364	27,495	27,606	27,717	27,829
Total All Buildings	**129,662**	**127,394**	**125,064**	**127,433**	**119,717**	**123,035**	**123,462**	**122,937**	**122,435**	**122,501**
% of Forecast Sales	37.75%	36.96%	36.17%	36.73%	34.39%	35.22%	35.22%	34.96%	34.70%	34.60%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	13,381	11,488	9,758	10,624	10,220	10,202	10,176	10,147	10,117	10,088
Commercial	14,215	13,953	13,856	13,924	13,357	13,482	13,656	13,579	13,509	13,757
Industrial & Agriculture	5,131	5,107	5,033	5,058	5,082	5,106	5,131	5,151	5,172	5,193
Total All Buildings	**32,727**	**30,548**	**28,647**	**29,606**	**28,658**	**28,790**	**28,963**	**28,877**	**28,798**	**29,038**
% of Forecast Sales	37.76%	35.13%	32.83%	33.81%	32.62%	32.66%	32.75%	32.54%	32.34%	32.50%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,273	4,339	4,987	5,896	5,681	6,832	8,253	9,782	11,318	12,789
Commercial	20,126	19,379	18,739	18,843	17,042	17,830	18,644	19,427	19,532	19,582
Industrial & Agriculture	2,160	1,890	1,603	1,454	1,319	1,314	1,283	1,286	1,289	1,293
Total All Buildings	**26,559**	**25,608**	**25,329**	**26,193**	**24,042**	**25,976**	**28,181**	**30,495**	**32,139**	**33,664**
% of Forecast Sales	7.73%	7.43%	7.32%	7.55%	6.91%	7.44%	8.04%	8.67%	9.11%	9.51%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	569	589	777	1,109	1,378	1,868	2,435	3,061	3,698	4,317
Commercial	4,254	4,118	4,002	4,021	3,665	3,821	3,986	4,144	4,144	4,136
Industrial & Agriculture	327	302	274	258	246	245	239	240	241	241
Total All Buildings	**5,150**	**5,008**	**5,053**	**5,388**	**5,289**	**5,934**	**6,660**	**7,445**	**8,083**	**8,694**
% of Forecast Sales	5.94%	5.76%	5.79%	6.15%	6.02%	6.73%	7.53%	8.39%	9.08%	9.73%

Incremental Market Potential

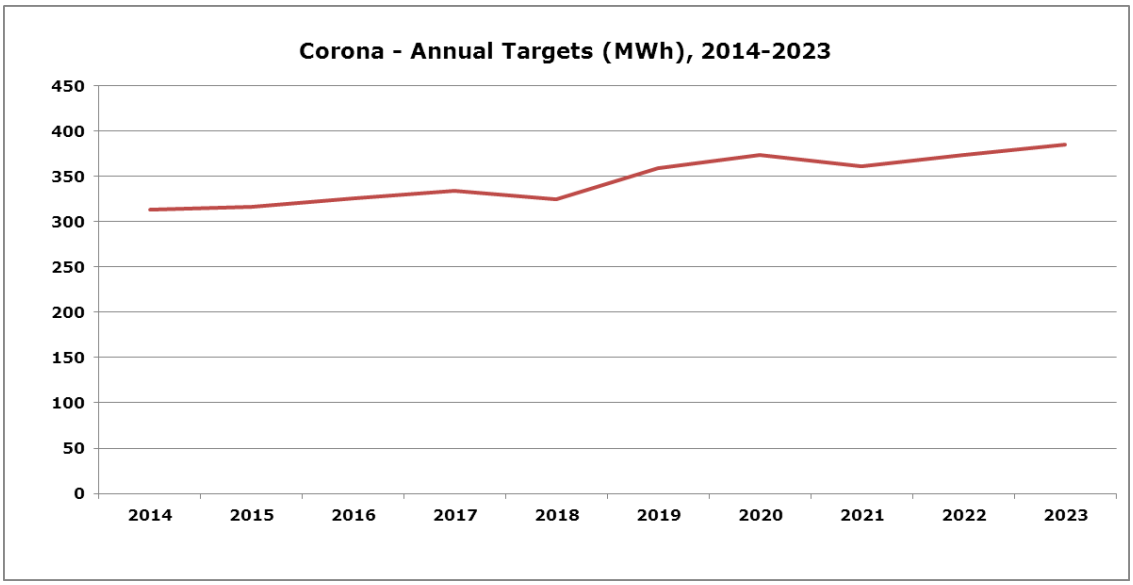
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	402	557	728	959	1,082	1,285	1,458	1,580	1,624	1,571
Commercial	322	436	550	664	722	797	841	850	822	768
Industrial & Agriculture	4	4	3	3	3	3	3	3	3	3
Total All Buildings	**729**	**997**	**1,281**	**1,626**	**1,808**	**2,085**	**2,302**	**2,433**	**2,449**	**2,342**
% of Forecast Sales	**0.21%**	**0.29%**	**0.37%**	**0.47%**	**0.52%**	**0.60%**	**0.66%**	**0.69%**	**0.69%**	**0.66%**
Utility Re-Participation	238	276	334	133	104	52	132	177	1,354	1,370
Total All Buildings (includes Re-participation)	**966**	**1,273**	**1,614**	**1,759**	**1,911**	**2,137**	**2,435**	**2,610**	**3,804**	**3,712**
% of Sales with Re-Participation	**0.28%**	**0.37%**	**0.47%**	**0.51%**	**0.55%**	**0.61%**	**0.69%**	**0.74%**	**1.08%**	**1.05%**
Codes & Standards	**856**	**1,216**	**1,464**	**1,491**	**2,154**	**2,149**	**2,106**	**2,025**	**1,738**	**1,528**
Incremental & Codes and Standard Effects as % of Forecast	**0.46%**	**0.64%**	**0.79%**	**0.90%**	**1.14%**	**1.21%**	**1.26%**	**1.27%**	**1.19%**	**1.09%**

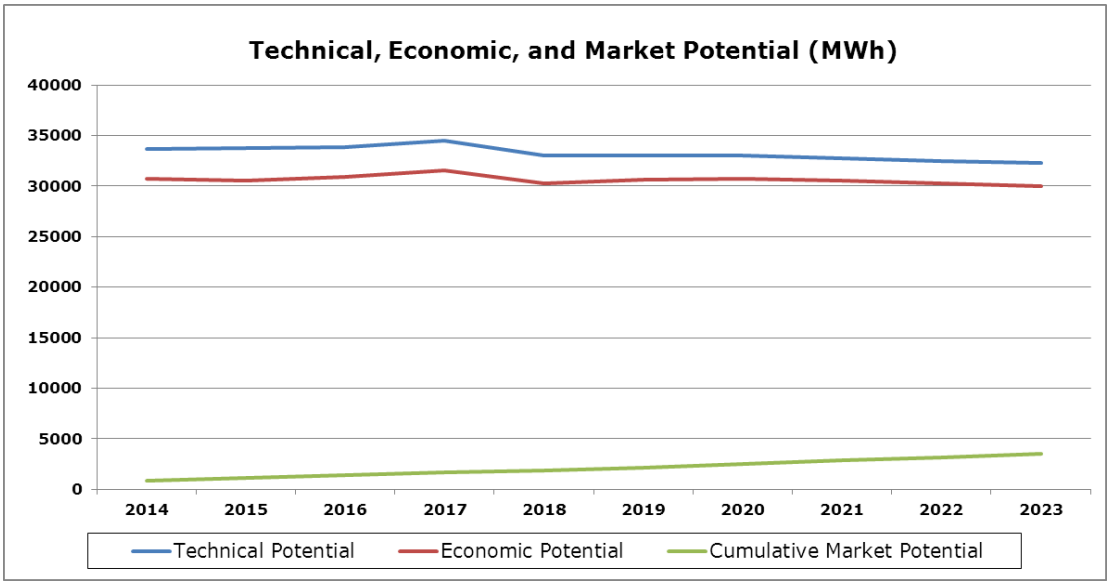
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	163	213	244	339	409	492	570	630	659	647
Commercial	60	80	102	125	140	158	170	173	166	157
Industrial & Agriculture	1	1	1	1	1	1	1	1	1	1
Total All Buildings	**223**	**294**	**346**	**464**	**549**	**651**	**741**	**804**	**826**	**805**
% of Forecast Sales	**0.26%**	**0.34%**	**0.40%**	**0.53%**	**0.62%**	**0.74%**	**0.84%**	**0.91%**	**0.93%**	**0.90%**
Utility Re-Participation	29	23	34	21	11	6	20	28	318	326
Total All Buildings (includes Re-participation)	**252**	**317**	**381**	**484**	**560**	**657**	**761**	**832**	**1,144**	**1,131**
% of Sales with Re-Participation	**0.29%**	**0.36%**	**0.44%**	**0.55%**	**0.64%**	**0.75%**	**0.86%**	**0.94%**	**1.28%**	**1.27%**
Codes & Standards	**469**	**618**	**782**	**791**	**879**	**870**	**863**	**778**	**590**	**495**
Incremental & Codes and Standard Effects as % of Forecast	**0.80%**	**1.05%**	**1.29%**	**1.43%**	**1.62%**	**1.73%**	**1.81%**	**1.78%**	**1.59%**	**1.45%**

CORONA DEPARTMENT OF WATER & POWER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**313**	**316**	**326**	**334**	**325**	**359**	**374**	**361**	**374**	**385**
Total Energy Use (GWh):	76.69	78.22	79.01	79.80	80.59	81.40	82.21	83.04	83.87	84.70
Residential Sector Energy Use (GWH):	2.41	2.46	2.49	2.51	2.54	2.56	2.59	2.61	2.64	2.67
Commercial Sector Energy Use (GWH):	70.33	71.74	72.46	73.18	73.91	74.65	75.40	76.15	76.91	77.68
Industrial Sector Energy Use (GWH):	3.94	4.02	4.06	4.10	4.14	4.19	4.23	4.27	4.31	4.36
Target as Percent of Total	***0.41%***	***0.40%***	***0.41%***	***0.42%***	***0.40%***	***0.44%***	***0.46%***	***0.44%***	***0.45%***	***0.45%***
Electric Demand										
Adopted Target (MW)	**0.07**	**0.07**	**0.07**	**0.08**	**0.07**	**0.08**	**0.08**	**0.08**	**0.09**	**0.09**
Total Demand (MW):	14.13	14.27	14.41	14.55	14.70	14.85	15.00	15.15	15.30	15.45
Residential Demand (MW):	0.44	0.45	0.45	0.46	0.46	0.47	0.47	0.48	0.48	0.49
Commercial Demand (MW):	12.96	13.08	13.22	13.35	13.48	13.62	13.75	13.89	14.03	14.17
Industrial Demand (MW):	0.73	0.73	0.74	0.75	0.76	0.76	0.77	0.78	0.79	0.79
Target as Percent of Total	***0.51%***	***0.51%***	***0.52%***	***0.52%***	***0.51%***	***0.54%***	***0.56%***	***0.56%***	***0.57%***	***0.57%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,086	1,013	991	987	894	882	885	882	880	877
Commercial	32,072	32,243	32,351	33,057	31,638	31,625	31,662	31,391	31,124	30,866
Industrial & Agriculture	503	496	484	481	478	484	489	495	500	505
Total All Buildings	**33,661**	**33,753**	**33,826**	**34,525**	**33,009**	**32,991**	**33,036**	**32,768**	**32,504**	**32,249**
% of Forecast Sales	43.89%	43.15%	42.82%	43.27%	40.96%	40.53%	40.18%	39.46%	38.76%	38.07%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	532	448	409	403	396	398	399	398	397	396
Commercial	7,711	7,627	7,625	7,782	7,520	7,552	7,597	7,543	7,490	7,440
Industrial & Agricultural	89	89	89	89	89	90	91	92	93	94
Total All Buildings	**8,331**	**8,165**	**8,123**	**8,274**	**8,004**	**8,039**	**8,087**	**8,033**	**7,981**	**7,930**
% of Forecast Sales	58.98%	57.22%	56.37%	56.85%	54.45%	54.15%	53.93%	53.04%	52.17%	51.33%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	605	576	560	579	531	615	620	620	621	622
Commercial	29,631	29,509	29,892	30,471	29,307	29,565	29,625	29,375	29,129	28,892
Industrial & Agriculture	482	475	446	451	456	462	481	495	500	505
Total All Buildings	**30,719**	**30,561**	**30,897**	**31,501**	**30,295**	**30,643**	**30,725**	**30,490**	**30,250**	**30,019**
% of Forecast Sales	40.06%	39.07%	39.11%	39.48%	37.59%	37.64%	37.37%	36.72%	36.07%	35.44%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	276	235	196	215	209	215	214	214	214	214
Commercial	6,553	6,411	6,513	6,659	6,464	6,640	6,695	6,651	6,608	6,566
Industrial & Agriculture	85	85	83	84	85	86	90	92	93	94
Total All Buildings	**6,914**	**6,731**	**6,792**	**6,958**	**6,759**	**6,941**	**7,000**	**6,958**	**6,915**	**6,874**
% of Forecast Sales	48.94%	47.18%	47.13%	47.81%	45.98%	46.75%	46.68%	45.94%	45.20%	44.49%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	48	55	63	73	49	55	68	83	98	114
Commercial	784	1,028	1,270	1,544	1,699	2,000	2,305	2,613	2,921	3,225
Industrial & Agriculture	48	64	80	95	108	122	137	154	169	185
Total All Buildings	**880**	**1,147**	**1,413**	**1,712**	**1,857**	**2,177**	**2,511**	**2,851**	**3,188**	**3,524**
% of Forecast Sales	1.15%	1.47%	1.79%	2.15%	2.30%	2.67%	3.05%	3.43%	3.80%	4.16%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6	9	12	16	19	24	31	38	45	53
Commercial	179	235	290	352	389	457	527	597	668	739
Industrial & Agriculture	9	12	15	18	20	23	26	29	32	34
Total All Buildings	**194**	**256**	**317**	**386**	**428**	**504**	**583**	**664**	**745**	**826**
% of Forecast Sales	1.37%	1.79%	2.20%	2.65%	2.91%	3.40%	3.89%	4.38%	4.87%	5.35%

Incremental Market Potential

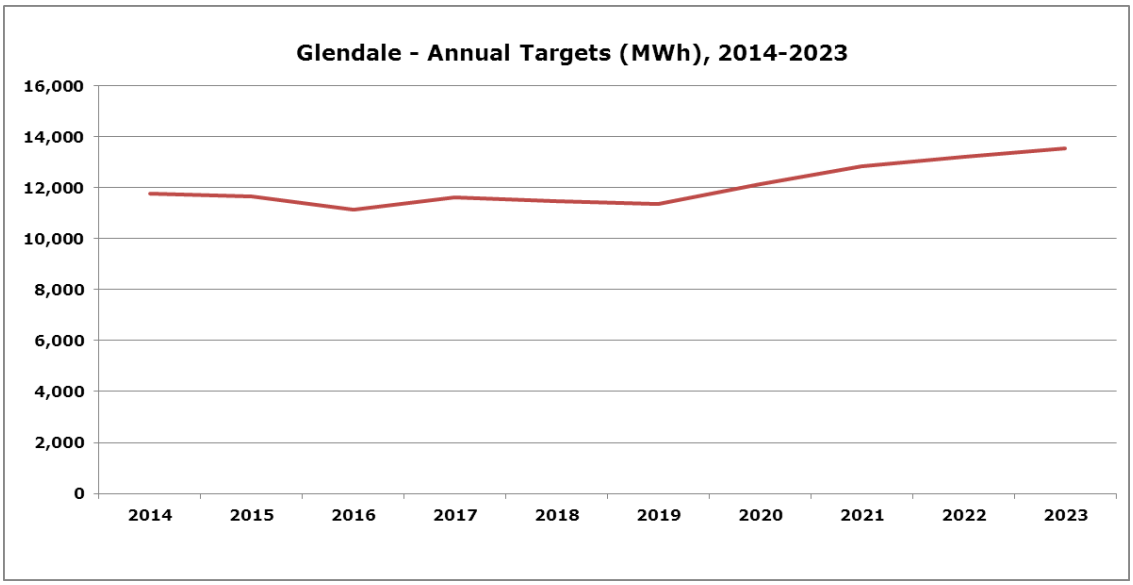
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6	8	9	10	10	12	14	15	16	17
Commercial	285	288	296	304	293	303	310	314	315	313
Industrial & Agriculture	17	17	16	16	15	14	16	17	17	18
Total All Buildings	**308**	**313**	**321**	**330**	**318**	**329**	**339**	**346**	**348**	**347**
% of Forecast Sales	**0.40%**	**0.40%**	**0.41%**	**0.41%**	**0.39%**	**0.40%**	**0.41%**	**0.42%**	**0.42%**	**0.41%**
Utility Re-Participation	5	4	5	4	7	30	35	16	26	38
Total All Buildings (includes Re-participation)	**313**	**316**	**326**	**334**	**325**	**359**	**374**	**361**	**374**	**385**
% of Sales with Re-Participation	**0.41%**	**0.40%**	**0.41%**	**0.42%**	**0.40%**	**0.44%**	**0.46%**	**0.44%**	**0.45%**	**0.45%**
Codes & Standards	**185**	**268**	**356**	**380**	**458**	**454**	**449**	**443**	**365**	**329**
Incremental & Codes and Standard Effects as % of Forecast	**0.65%**	**0.75%**	**0.86%**	**0.89%**	**0.97%**	**1.00%**	**1.00%**	**0.97%**	**0.88%**	**0.84%**

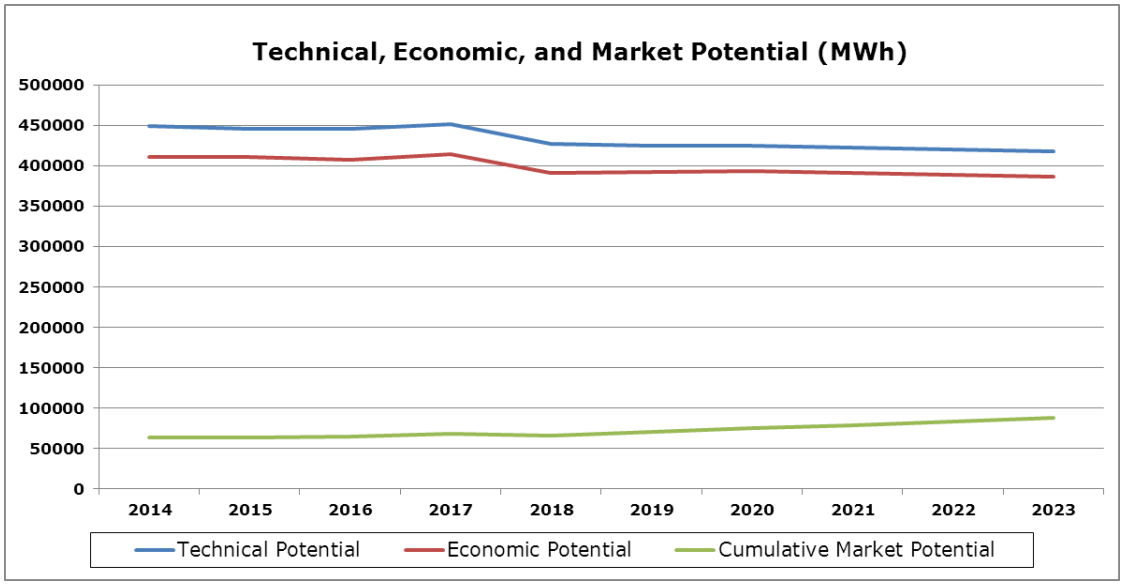
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3	3	4	5	5	6	6	7	8	8
Commercial	66	66	67	68	66	69	70	71	72	72
Industrial & Agriculture	3	3	3	3	3	3	3	3	3	3
Total All Buildings	**72**	**72**	**74**	**76**	**74**	**77**	**80**	**82**	**83**	**83**
% of Forecast Sales	**0.51%**	**0.51%**	**0.51%**	**0.52%**	**0.50%**	**0.52%**	**0.53%**	**0.54%**	**0.54%**	**0.54%**
Utility Re-Participation	1	0	1	0	1	4	4	2	4	5
Total All Buildings (includes Re-participation)	**72**	**73**	**74**	**76**	**74**	**81**	**84**	**84**	**87**	**88**
% of Sales with Re-Participation	**0.51%**	**0.51%**	**0.52%**	**0.52%**	**0.51%**	**0.54%**	**0.56%**	**0.56%**	**0.57%**	**0.57%**
Codes & Standards	**82**	**66**	**91**	**97**	**114**	**113**	**112**	**109**	**93**	**87**
Incremental & Codes and Standard Effects as % of Forecast	**1.09%**	**0.97%**	**1.15%**	**1.19%**	**1.28%**	**1.30%**	**1.30%**	**1.27%**	**1.18%**	**1.14%**

GLENDALE WATER & POWER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**11,782**	**11,671**	**11,151**	**11,607**	**11,486**	**11,371**	**12,120**	**12,830**	**13,214**	**13,548**
Total Energy Use (GWh):	1,104.19	1,109.71	1,115.26	1,120.84	1,126.44	1,132.07	1,137.73	1,143.42	1,149.14	1,154.89
Residential Sector Energy Use (GWH):	358.93	359.26	359.58	359.90	360.22	360.54	360.86	361.18	361.50	361.81
Commercial Sector Energy Use (GWH):	307.04	307.32	307.60	307.88	308.15	308.42	308.70	308.97	309.24	309.51
Industrial Sector Energy Use (GWH):	379.10	379.44	379.79	380.13	380.47	380.80	381.14	381.48	381.81	382.14
Target as Percent of Total	***1.07%***	***1.05%***	***1.00%***	***1.04%***	***1.02%***	***1.00%***	***1.07%***	***1.12%***	***1.15%***	***1.17%***
Electric Demand										
Adopted Target (MW)	**1.03**	**0.99**	**1.02**	**1.13**	**1.16**	**1.15**	**1.32**	**1.59**	**1.72**	**1.82**
Total Demand (MW):	360.55	362.35	364.16	365.98	367.81	369.65	371.50	373.36	375.22	377.10
Residential Demand (MW):	117.20	117.31	117.41	117.52	117.62	117.73	117.83	117.94	118.04	118.14
Commercial Demand (MW):	100.26	100.35	100.44	100.53	100.62	100.71	100.80	100.89	100.97	101.06
Industrial Demand (MW):	123.79	123.90	124.01	124.12	124.23	124.34	124.45	124.56	124.67	124.78
Target as Percent of Total	***0.28%***	***0.27%***	***0.28%***	***0.31%***	***0.32%***	***0.31%***	***0.36%***	***0.42%***	***0.46%***	***0.48%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	132,170	126,684	124,734	125,175	112,169	110,932	111,115	110,506	109,894	109,290
Commercial	260,020	263,577	266,554	272,964	261,858	260,985	260,795	258,650	256,570	254,551
Industrial & Agriculture	56,975	55,589	54,201	53,569	52,935	53,062	53,188	53,271	53,354	53,437
Total All Buildings	**449,164**	**445,850**	**445,489**	**451,708**	**426,962**	**424,978**	**425,097**	**422,426**	**419,817**	**417,278**
% of Forecast Sales	40.68%	40.18%	39.94%	40.30%	37.90%	37.54%	37.36%	36.94%	36.53%	36.13%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	41,475	35,952	32,380	32,395	31,160	31,285	31,346	31,260	31,161	31,067
Commercial	59,935	59,981	60,586	61,974	59,827	59,788	59,923	59,517	59,128	58,752
Industrial & Agricultural	10,208	10,090	9,972	9,925	9,878	9,901	9,925	9,940	9,956	9,971
Total All Buildings	**111,618**	**106,023**	**102,938**	**104,294**	**100,865**	**100,975**	**101,194**	**100,718**	**100,245**	**99,791**
% of Forecast Sales	30.96%	29.26%	28.27%	28.50%	27.42%	27.32%	27.24%	26.98%	26.72%	26.46%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	114,337	112,698	109,816	110,243	96,032	96,878	96,888	96,296	95,700	95,106
Commercial	240,764	244,260	246,471	251,601	242,263	243,113	243,111	241,152	239,257	237,420
Industrial & Agriculture	55,448	54,061	51,154	52,137	52,263	52,388	53,072	53,155	53,238	53,321
Total All Buildings	**410,549**	**411,019**	**407,441**	**413,981**	**390,557**	**392,380**	**393,071**	**390,604**	**388,195**	**385,847**
% of Forecast Sales	37.18%	37.04%	36.53%	36.93%	34.67%	34.66%	34.55%	34.16%	33.78%	33.41%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	23,615	20,965	17,305	17,272	15,881	15,861	15,778	15,707	15,628	15,551
Commercial	51,637	51,849	52,513	53,700	51,953	52,748	52,957	52,625	52,308	52,004
Industrial & Agriculture	9,923	9,805	9,545	9,729	9,752	9,776	9,903	9,919	9,934	9,950
Total All Buildings	**85,174**	**82,618**	**79,363**	**80,701**	**77,587**	**78,385**	**78,639**	**78,251**	**77,871**	**77,505**
% of Forecast Sales	23.62%	22.80%	21.79%	22.05%	21.09%	21.20%	21.17%	20.96%	20.75%	20.55%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	19,336	17,811	17,693	18,889	16,329	17,369	18,966	20,682	22,467	24,292
Commercial	37,844	38,598	39,423	40,977	40,717	42,964	45,271	47,347	49,418	51,413
Industrial & Agriculture	6,769	7,261	7,702	8,269	8,802	9,562	10,186	10,902	11,589	12,265
Total All Buildings	**63,950**	**63,670**	**64,818**	**68,135**	**65,848**	**69,894**	**74,422**	**78,930**	**83,475**	**87,970**
% of Forecast Sales	5.79%	5.74%	5.81%	6.08%	5.85%	6.17%	6.54%	6.90%	7.26%	7.62%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,160	2,681	2,388	2,729	2,738	3,206	3,734	4,316	4,923	5,555
Commercial	7,610	7,696	7,870	8,184	8,122	8,564	9,027	9,419	9,817	10,196
Industrial & Agriculture	1,182	1,298	1,409	1,529	1,642	1,784	1,901	2,034	2,163	2,289
Total All Buildings	**12,952**	**11,675**	**11,666**	**12,443**	**12,503**	**13,555**	**14,661**	**15,769**	**16,903**	**18,039**
% of Forecast Sales	3.59%	3.22%	3.20%	3.40%	3.40%	3.67%	3.95%	4.22%	4.50%	4.78%

Incremental Market Potential

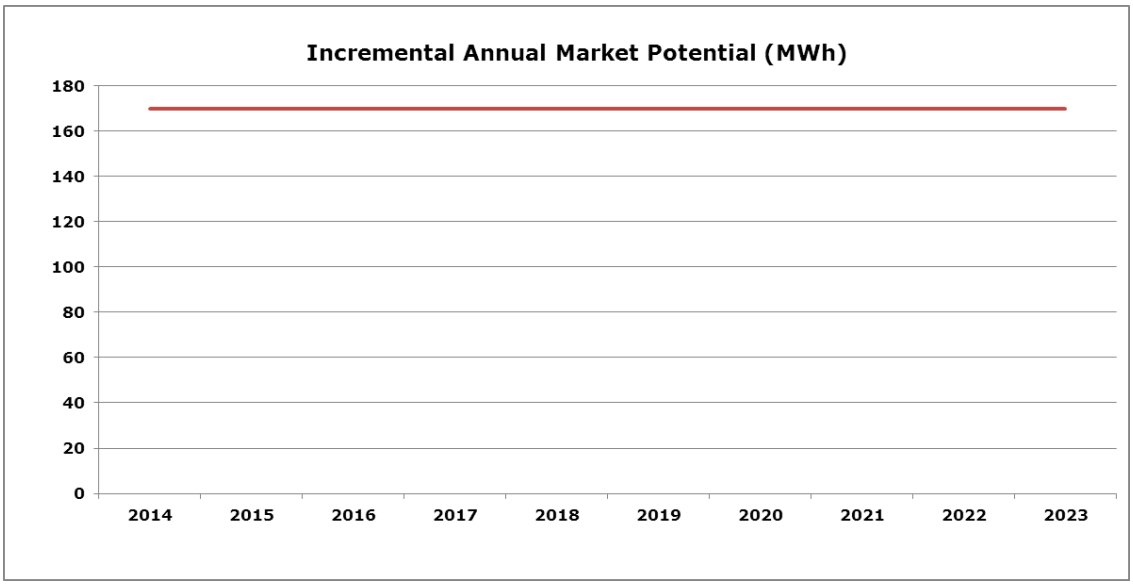
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6,891	7,057	7,467	7,646	7,489	7,666	7,831	7,973	8,081	8,142
Commercial	1,765	1,903	2,027	2,171	2,174	2,307	2,401	2,466	2,483	2,459
Industrial & Agriculture	770	792	791	810	806	795	797	787	780	772
Total All Buildings	**9,426**	**9,751**	**10,286**	**10,627**	**10,469**	**10,768**	**11,030**	**11,226**	**11,343**	**11,373**
% of Forecast Sales	**0.85%**	**0.88%**	**0.92%**	**0.95%**	**0.93%**	**0.95%**	**0.97%**	**0.98%**	**0.99%**	**0.98%**
Utility Re-Participation	2,357	1,920	865	980	1,017	603	1,090	1,604	1,871	2,175
Total All Buildings (includes Re-participation)	**11,782**	**11,671**	**11,151**	**11,607**	**11,486**	**11,371**	**12,120**	**12,830**	**13,214**	**13,548**
% of Sales with Re-Participation	**1.07%**	**1.05%**	**1.00%**	**1.04%**	**1.02%**	**1.00%**	**1.07%**	**1.12%**	**1.15%**	**1.17%**
Codes & Standards	**2,745**	**3,826**	**4,517**	**4,548**	**6,312**	**6,282**	**6,135**	**5,917**	**5,186**	**4,554**
Incremental & Codes and Standard Effects as % of Forecast	**1.32%**	**1.40%**	**1.40%**	**1.44%**	**1.58%**	**1.56%**	**1.60%**	**1.64%**	**1.60%**	**1.57%**

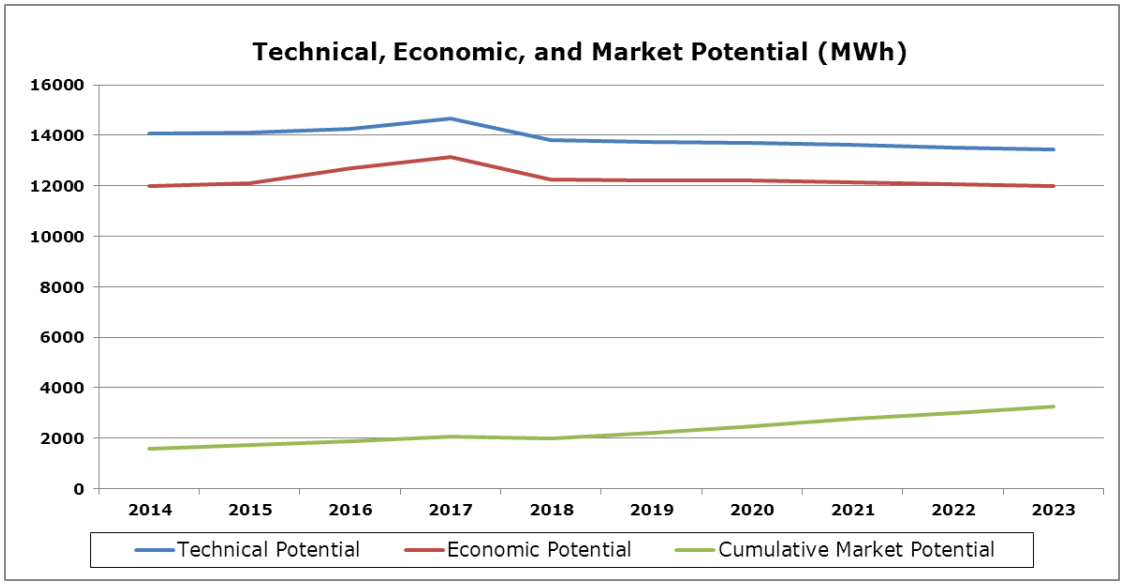
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	261	305	332	393	424	487	549	606	651	680
Commercial	365	386	403	424	419	449	469	486	494	494
Industrial & Agriculture	138	145	148	151	150	148	149	147	145	144
Total All Buildings	**765**	**836**	**883**	**968**	**993**	**1,085**	**1,167**	**1,238**	**1,290**	**1,318**
% of Forecast Sales	**0.21%**	**0.23%**	**0.24%**	**0.26%**	**0.27%**	**0.29%**	**0.31%**	**0.33%**	**0.34%**	**0.35%**
Utility Re-Participation	261	151	134	165	170	69	157	347	426	499
Total All Buildings (includes Re-participation)	**1,026**	**986**	**1,017**	**1,133**	**1,163**	**1,153**	**1,324**	**1,586**	**1,716**	**1,817**
% of Sales with Re-Participation	**0.28%**	**0.27%**	**0.28%**	**0.31%**	**0.32%**	**0.31%**	**0.36%**	**0.42%**	**0.46%**	**0.48%**
Codes & Standards	**1,255**	**1,558**	**1,958**	**1,979**	**2,212**	**2,188**	**2,164**	**1,985**	**1,585**	**1,296**
Incremental & Codes and Standard Effects as % of Forecast	**0.63%**	**0.70%**	**0.82%**	**0.85%**	**0.92%**	**0.90%**	**0.94%**	**0.96%**	**0.88%**	**0.83%**

GRIDLEY MUNICIPAL UTILITY



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**
Total Energy Use (GWh):	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24	33.24
Residential Sector Energy Use (GWH):	14.90	14.90	14.90	14.90	14.90	14.90	14.90	14.90	14.90	14.90
Commercial Sector Energy Use (GWH):	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16
Industrial Sector Energy Use (GWH):	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17
Target as Percent of Total	***0.45%***	***0.50%***	***0.57%***	***0.75%***	***0.69%***	***0.77%***	***0.83%***	***0.89%***	***1.19%***	***0.96%***
Electric Demand										
Adopted Target (MW)	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Total Demand (MW):	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60
Residential Demand (MW):	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
Commercial Demand (MW):	4.84	4.84	4.84	4.84	4.84	4.84	4.84	4.84	4.84	4.84
Industrial Demand (MW):	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Target as Percent of Total	***0.43%***	***0.43%***	***0.43%***	***0.43%***	***0.43%***	***0.43%***	***0.43%***	***0.43%***	***0.43%***	***0.43%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6,356	6,135	6,041	6,076	5,529	5,476	5,499	5,488	5,476	5,466
Commercial	7,241	7,521	7,776	8,156	7,863	7,816	7,772	7,695	7,621	7,542
Industrial & Agriculture	458	449	439	435	431	431	432	432	432	433
Total All Buildings	**14,055**	**14,105**	**14,256**	**14,668**	**13,822**	**13,723**	**13,703**	**13,614**	**13,529**	**13,440**
% of Forecast Sales	42.28%	42.44%	42.89%	44.13%	41.59%	41.29%	41.23%	40.96%	40.70%	40.44%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,806	2,537	2,362	2,375	2,333	2,347	2,358	2,359	2,361	2,364
Commercial	1,539	1,576	1,617	1,694	1,641	1,635	1,631	1,616	1,602	1,587
Industrial & Agricultural	83	82	81	81	80	80	81	81	81	81
Total All Buildings	**4,427**	**4,195**	**4,059**	**4,149**	**4,054**	**4,063**	**4,069**	**4,055**	**4,044**	**4,032**
% of Forecast Sales	41.77%	39.57%	38.30%	39.14%	38.25%	38.33%	38.39%	38.26%	38.15%	38.04%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,126	4,962	5,221	5,308	4,689	4,685	4,695	4,703	4,690	4,678
Commercial	6,412	6,718	7,051	7,415	7,155	7,116	7,080	7,009	6,943	6,871
Industrial & Agriculture	449	439	420	421	421	422	423	423	423	424
Total All Buildings	**11,986**	**12,119**	**12,692**	**13,144**	**12,266**	**12,223**	**12,198**	**12,135**	**12,056**	**11,972**
% of Forecast Sales	36.06%	36.46%	38.18%	39.54%	36.90%	36.77%	36.70%	36.51%	36.27%	36.02%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,848	1,699	1,427	1,530	1,477	1,479	1,479	1,479	1,479	1,480
Commercial	1,286	1,340	1,417	1,489	1,443	1,440	1,437	1,424	1,412	1,399
Industrial & Agriculture	81	80	78	78	79	79	79	79	79	79
Total All Buildings	**3,215**	**3,119**	**2,922**	**3,097**	**2,999**	**2,997**	**2,995**	**2,982**	**2,970**	**2,958**
% of Forecast Sales	30.33%	29.43%	27.57%	29.22%	28.29%	28.28%	28.25%	28.13%	28.02%	27.91%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	183	272	388	518	537	684	871	1,071	1,272	1,463
Commercial	936	944	957	995	928	987	1,048	1,109	1,123	1,169
Industrial & Agriculture	358	366	373	367	374	384	393	399	407	415
Total All Buildings	**1,477**	**1,583**	**1,719**	**1,880**	**1,839**	**2,055**	**2,312**	**2,580**	**2,802**	**3,048**
% of Forecast Sales	4.44%	4.76%	5.17%	5.66%	5.53%	6.18%	6.96%	7.76%	8.43%	9.17%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	50	74	106	154	200	271	353	444	536	625
Commercial	196	198	201	209	197	209	222	235	236	246
Industrial & Agriculture	66	68	69	68	70	72	73	75	76	77
Total All Buildings	**312**	**339**	**377**	**432**	**467**	**552**	**649**	**753**	**848**	**948**
% of Forecast Sales	2.95%	3.20%	3.56%	4.07%	4.41%	5.21%	6.12%	7.10%	8.00%	8.94%

Incremental Market Potential

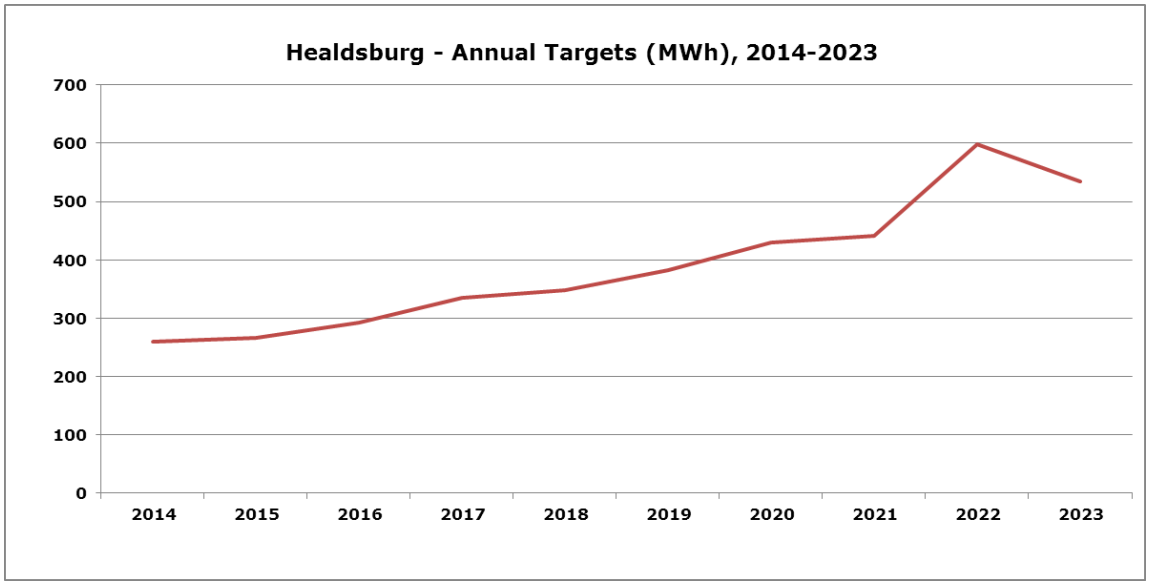
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	79	98	122	150	151	176	197	212	217	209
Commercial	46	49	54	58	58	60	62	62	61	57
Industrial & Agriculture	11	11	11	11	11	11	10	10	10	9
Total All Buildings	**135**	**159**	**187**	**220**	**220**	**247**	**269**	**284**	**287**	**275**
% of Forecast Sales	**0.41%**	**0.48%**	**0.56%**	**0.66%**	**0.66%**	**0.74%**	**0.81%**	**0.85%**	**0.86%**	**0.83%**
Utility Re-Participation	13	8	1	28	10	9	7	13	108	43
Total All Buildings (includes Re-participation)	**148**	**167**	**188**	**248**	**230**	**256**	**277**	**297**	**395**	**319**
% of Sales with Re-Participation	**0.45%**	**0.50%**	**0.57%**	**0.75%**	**0.69%**	**0.77%**	**0.83%**	**0.89%**	**1.19%**	**0.96%**
Codes & Standards	**90**	**134**	**160**	**158**	**231**	**232**	**227**	**217**	**191**	**163**
Incremental & Codes and Standard Effects as % of Forecast	**0.72%**	**0.91%**	**1.05%**	**1.22%**	**1.39%**	**1.47%**	**1.51%**	**1.55%**	**1.76%**	**1.45%**

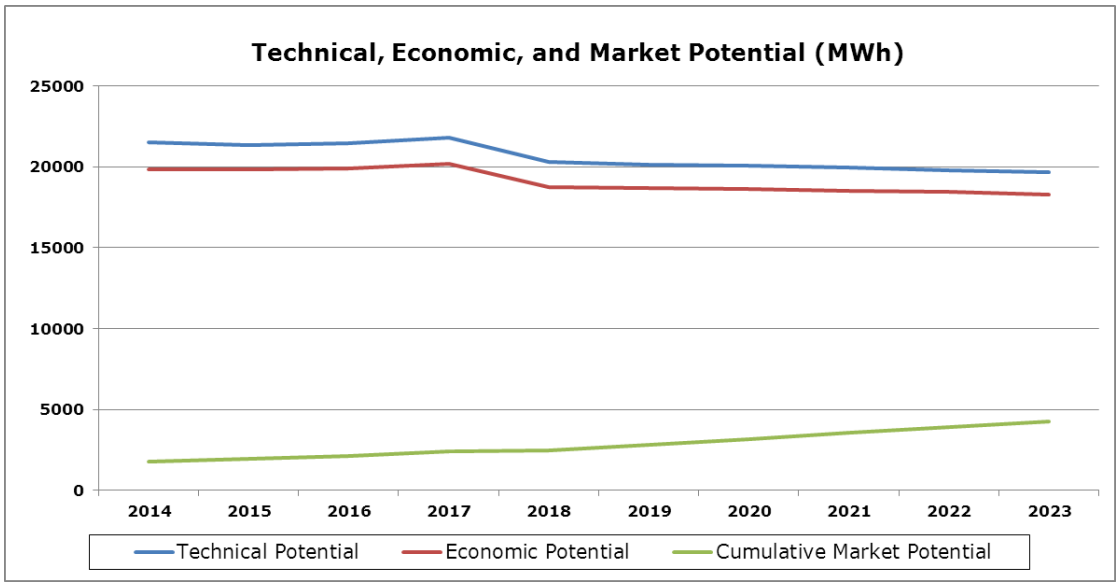
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	26	33	38	51	60	72	83	92	96	94
Commercial	9	10	11	12	12	12	13	13	13	12
Industrial & Agriculture	2	2	2	2	2	2	2	2	2	2
Total All Buildings	**37**	**45**	**51**	**64**	**74**	**86**	**98**	**106**	**110**	**108**
% of Forecast Sales	**0.35%**	**0.42%**	**0.48%**	**0.61%**	**0.70%**	**0.82%**	**0.92%**	**1.00%**	**1.04%**	**1.01%**
Utility Re-Participation	2	1	0	5	1	1	1	2	26	11
Total All Buildings (includes Re-participation)	**39**	**46**	**51**	**70**	**75**	**87**	**99**	**108**	**136**	**119**
% of Sales with Re-Participation	**0.37%**	**0.43%**	**0.48%**	**0.66%**	**0.71%**	**0.82%**	**0.93%**	**1.02%**	**1.28%**	**1.12%**
Codes & Standards	**45**	**71**	**91**	**91**	**99**	**98**	**98**	**87**	**65**	**53**
Incremental & Codes and Standard Effects as % of Forecast	**0.80%**	**1.11%**	**1.33%**	**1.51%**	**1.64%**	**1.75%**	**1.85%**	**1.84%**	**1.90%**	**1.62%**

CITY OF HEALDSBURG



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**260**	**266**	**293**	**336**	**348**	**382**	**429**	**441**	**598**	**535**
Total Energy Use (GWh):	79.27	79.39	84.63	89.87	90.77	91.68	92.60	93.52	94.46	95.40
Residential Sector Energy Use (GWH):	27.70	27.74	29.57	31.41	31.72	32.04	32.36	32.68	33.01	33.34
Commercial Sector Energy Use (GWH):	39.57	39.63	42.25	44.86	45.31	45.77	46.22	46.69	47.15	47.62
Industrial Sector Energy Use (GWH):	7.91	7.93	8.45	8.97	9.06	9.15	9.24	9.34	9.43	9.52
Target as Percent of Total	***0.33%***	***0.34%***	***0.35%***	***0.37%***	***0.38%***	***0.42%***	***0.46%***	***0.47%***	***0.63%***	***0.56%***
Electric Demand										
Adopted Target (MW)	**0.06**	**0.06**	**0.07**	**0.08**	**0.09**	**0.10**	**0.12**	**0.12**	**0.16**	**0.15**
Total Demand (MW):	19.06	19.09	20.29	21.49	21.70	21.92	22.14	22.36	22.58	22.81
Residential Demand (MW):	6.66	6.67	7.09	7.51	7.58	7.66	7.74	7.81	7.89	7.97
Commercial Demand (MW):	9.52	9.53	10.13	10.73	10.83	10.94	11.05	11.16	11.27	11.39
Industrial Demand (MW):	1.90	1.91	2.03	2.15	2.17	2.19	2.21	2.23	2.25	2.28
Target as Percent of Total	***0.31%***	***0.33%***	***0.33%***	***0.36%***	***0.41%***	***0.46%***	***0.53%***	***0.55%***	***0.71%***	***0.67%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	9,274	8,965	8,854	8,871	7,728	7,567	7,555	7,495	7,436	7,376
Commercial	10,951	11,107	11,239	11,501	11,147	11,096	11,066	10,966	10,871	10,776
Industrial & Agriculture	1,310	1,293	1,359	1,433	1,438	1,454	1,471	1,486	1,502	1,518
Total All Buildings	**21,535**	**21,365**	**21,452**	**21,805**	**20,313**	**20,117**	**20,092**	**19,948**	**19,808**	**19,670**
% of Forecast Sales	27.17%	26.91%	25.35%	24.26%	22.38%	21.94%	21.70%	21.33%	20.97%	20.62%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,030	2,657	2,437	2,433	2,320	2,321	2,318	2,308	2,299	2,289
Commercial	7,908	8,448	9,000	8,986	8,854	8,782	8,716	8,631	8,547	8,465
Industrial & Agricultural	239	238	252	266	268	271	274	277	280	283
Total All Buildings	**11,177**	**11,342**	**11,688**	**11,685**	**11,443**	**11,375**	**11,308**	**11,216**	**11,127**	**11,037**
% of Forecast Sales	58.63%	59.40%	57.61%	54.39%	52.73%	51.90%	51.09%	50.17%	49.28%	48.39%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	8,428	8,253	8,129	8,158	6,963	6,917	6,901	6,843	6,823	6,764
Commercial	10,150	10,295	10,441	10,657	10,371	10,328	10,306	10,215	10,127	10,040
Industrial & Agriculture	1,292	1,275	1,318	1,401	1,417	1,433	1,450	1,465	1,481	1,496
Total All Buildings	**19,869**	**19,823**	**19,887**	**20,217**	**18,751**	**18,679**	**18,657**	**18,522**	**18,431**	**18,300**
% of Forecast Sales	25.07%	24.97%	23.50%	22.49%	20.66%	20.37%	20.15%	19.81%	19.51%	19.18%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,866	1,694	1,452	1,449	1,446	1,441	1,431	1,423	1,414	1,405
Commercial	2,150	2,159	2,191	2,238	2,190	2,188	2,191	2,175	2,159	2,144
Industrial & Agriculture	235	234	246	262	264	267	271	273	276	279
Total All Buildings	**4,251**	**4,087**	**3,889**	**3,949**	**3,901**	**3,896**	**3,893**	**3,871**	**3,850**	**3,829**
% of Forecast Sales	22.30%	21.41%	19.17%	18.38%	17.97%	17.78%	17.58%	17.31%	17.05%	16.79%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	142	214	310	439	487	642	824	1,019	1,217	1,407
Commercial	1,427	1,520	1,612	1,744	1,777	1,951	2,131	2,313	2,471	2,632
Industrial & Agriculture	208	216	216	221	226	234	237	241	245	248
Total All Buildings	**1,777**	**1,949**	**2,137**	**2,403**	**2,491**	**2,827**	**3,192**	**3,573**	**3,933**	**4,287**
% of Forecast Sales	2.24%	2.46%	2.53%	2.67%	2.74%	3.08%	3.45%	3.82%	4.16%	4.49%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	39	62	86	124	163	222	291	367	446	522
Commercial	286	305	324	351	359	396	434	473	507	542
Industrial & Agriculture	36	38	39	41	42	44	44	45	46	46
Total All Buildings	**362**	**405**	**449**	**516**	**564**	**661**	**769**	**885**	**999**	**1,110**
% of Forecast Sales	1.90%	2.12%	2.21%	2.40%	2.60%	3.02%	3.47%	3.96%	4.42%	4.87%

Incremental Market Potential

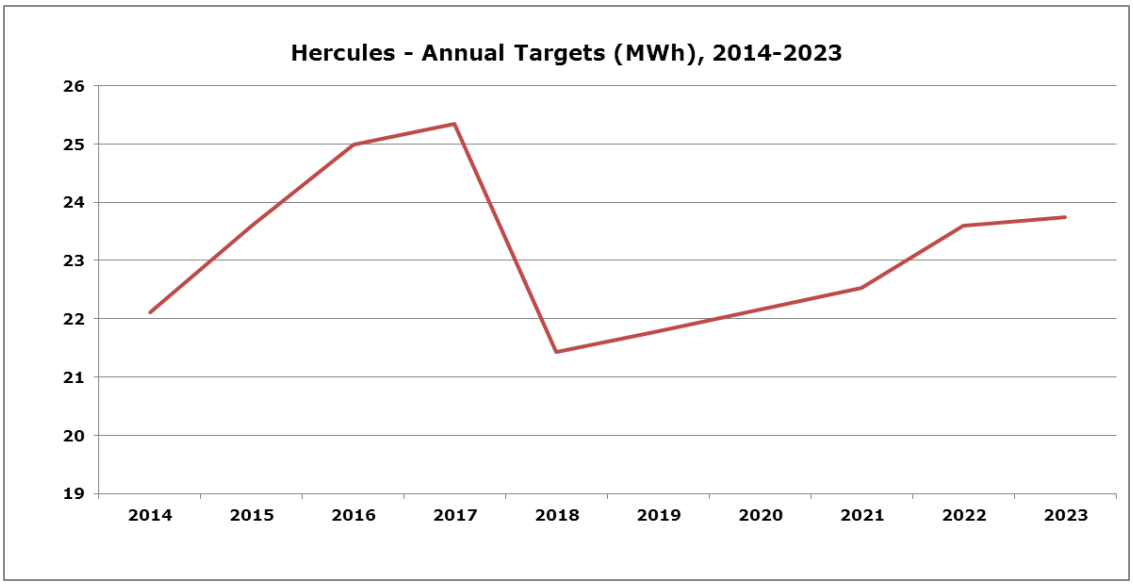
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	59	82	105	134	140	166	188	203	210	204
Commercial	152	154	159	167	169	176	182	185	191	181
Industrial & Agriculture	28	18	10	11	11	8	8	4	4	4
Total All Buildings	**239**	**253**	**274**	**312**	**320**	**349**	**378**	**393**	**405**	**388**
% of Forecast Sales	**0.30%**	**0.32%**	**0.32%**	**0.35%**	**0.35%**	**0.38%**	**0.41%**	**0.42%**	**0.43%**	**0.41%**
Utility Re-Participation	21	13	19	24	28	33	51	48	193	146
Total All Buildings (includes Re-participation)	**260**	**266**	**293**	**336**	**348**	**382**	**429**	**441**	**598**	**535**
% of Sales with Re-Participation	**0.33%**	**0.34%**	**0.35%**	**0.37%**	**0.38%**	**0.42%**	**0.46%**	**0.47%**	**0.63%**	**0.56%**
Codes & Standards	**154**	**207**	**231**	**227**	**351**	**352**	**343**	**328**	**300**	**255**
Incremental & Codes and Standard Effects as % of Forecast	**0.50%**	**0.58%**	**0.60%**	**0.60%**	**0.74%**	**0.76%**	**0.78%**	**0.77%**	**0.75%**	**0.67%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	21	27	31	39	49	60	69	77	81	80
Commercial	30	31	32	34	35	37	39	40	41	39
Industrial & Agriculture	5	3	2	2	2	1	2	1	1	1
Total All Buildings	**56**	**61**	**64**	**75**	**86**	**98**	**109**	**118**	**122**	**119**
% of Forecast Sales	**0.29%**	**0.32%**	**0.32%**	**0.35%**	**0.40%**	**0.45%**	**0.49%**	**0.53%**	**0.54%**	**0.52%**
Utility Re-Participation	2	2	2	2	3	4	7	5	38	33
Total All Buildings (includes Re-participation)	**58**	**63**	**66**	**77**	**89**	**102**	**116**	**122**	**160**	**153**
% of Sales with Re-Participation	**0.31%**	**0.33%**	**0.33%**	**0.36%**	**0.41%**	**0.46%**	**0.53%**	**0.55%**	**0.71%**	**0.67%**
Codes & Standards	**69**	**91**	**111**	**111**	**124**	**123**	**121**	**109**	**84**	**70**
Incremental & Codes and Standard Effects as % of Forecast	**0.66%**	**0.80%**	**0.86%**	**0.87%**	**0.97%**	**1.01%**	**1.04%**	**1.01%**	**0.92%**	**0.83%**

CITY OF HERCULES MUNICIPAL UTILITY



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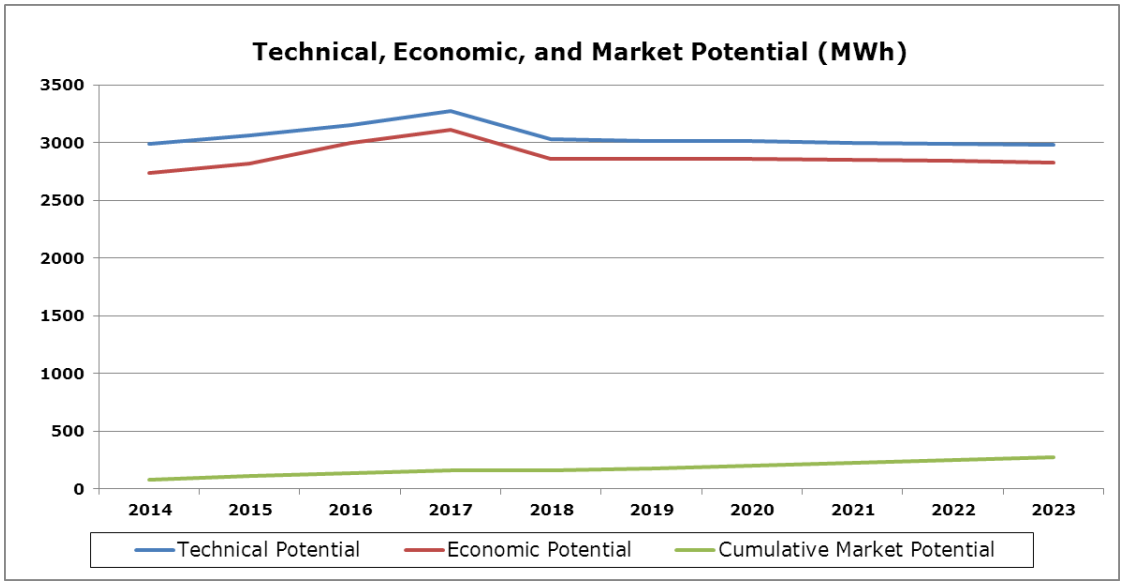
Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**22**	**24**	**25**	**25**	**21**	**22**	**22**	**23**	**24**	**24**
Total Energy Use (GWh):	16.86	17.20	17.54	17.89	18.25	18.62	18.99	19.37	19.76	20.15
Residential Sector Energy Use (GWH):	4.29	4.37	4.46	4.55	4.64	4.74	4.83	4.93	5.02	5.13
Commercial Sector Energy Use (GWH):	8.10	8.26	8.42	8.59	8.76	8.94	9.12	9.30	9.49	9.68
Industrial Sector Energy Use (GWH):	4.48	4.57	4.66	4.75	4.84	4.94	5.04	5.14	5.24	5.35
Target as Percent of Total	***0.16%***	***0.16%***	***0.17%***	***0.17%***	***0.14%***	***0.14%***	***0.13%***	***0.13%***	***0.14%***	***0.13%***
Electric Demand										
Adopted Target (MW)	**0.004**	**0.004**	**0.004**	**0.004**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**
Total Demand (MW):	3.04	3.10	3.16	3.23	3.29	3.36	3.42	3.49	3.56	3.63
Residential Demand (MW):	0.77	0.79	0.80	0.82	0.84	0.85	0.87	0.89	0.91	0.92
Commercial Demand (MW):	0.37	0.38	0.39	0.39	0.40	0.41	0.42	0.43	0.44	0.44
Industrial Demand (MW):	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.12
Target as Percent of Total	***0.12%***	***0.12%***	***0.13%***	***0.12%***	***0.10%***	***0.10%***	***0.10%***	***0.10%***	***0.10%***	***0.10%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	599	576	576	581	450	441	441	438	436	433
Commercial	1,895	1,977	2,058	2,162	2,040	2,024	2,009	1,988	1,970	1,948
Industrial & Agriculture	498	508	518	529	539	550	561	572	584	595
Total All Buildings	**2,992**	**3,061**	**3,152**	**3,272**	**3,030**	**3,015**	**3,011**	**2,999**	**2,989**	**2,976**
% of Forecast Sales	17.74%	17.80%	17.97%	18.28%	16.60%	16.19%	15.86%	15.48%	15.13%	14.77%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	53	39	37	37	23	23	23	22	22	22
Commercial	392	372	385	405	379	376	373	369	366	361
Industrial & Agricultural	93	95	97	99	101	103	105	107	109	111
Total All Buildings	**538**	**506**	**519**	**540**	**502**	**501**	**500**	**498**	**496**	**494**
% of Forecast Sales	17.70%	16.33%	16.40%	16.74%	15.27%	14.94%	14.61%	14.26%	13.93%	13.60%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	498	489	564	570	426	429	430	427	424	422
Commercial	1,742	1,828	1,923	2,021	1,903	1,888	1,874	1,855	1,838	1,818
Industrial & Agriculture	493	503	513	523	534	544	555	566	578	589
Total All Buildings	**2,733**	**2,820**	**3,000**	**3,114**	**2,862**	**2,862**	**2,860**	**2,849**	**2,840**	**2,829**
% of Forecast Sales	16.21%	16.40%	17.10%	17.40%	15.68%	15.37%	15.06%	14.71%	14.38%	14.04%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	35	34	34	34	19	20	19	19	19	18
Commercial	362	346	364	383	358	355	352	348	345	341
Industrial & Agriculture	92	94	96	98	100	102	104	106	108	110
Total All Buildings	**489**	**473**	**493**	**514**	**477**	**476**	**475**	**473**	**471**	**469**
% of Forecast Sales	16.09%	15.26%	15.59%	15.93%	14.49%	14.17%	13.87%	13.54%	13.23%	12.92%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	20	25	31	35	20	20	24	28	32	37
Commercial	35	47	58	69	68	78	88	97	106	115
Industrial & Agriculture	26	36	47	58	69	80	90	101	111	120
Total All Buildings	**81**	**108**	**136**	**163**	**157**	**178**	**202**	**226**	**249**	**272**
% of Forecast Sales	0.48%	0.63%	0.77%	0.91%	0.86%	0.96%	1.06%	1.17%	1.26%	1.35%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2	2	3	3	1	1	1	2	2	2
Commercial	7	9	11	13	12	14	16	17	19	20
Industrial & Agriculture	5	7	9	11	13	15	17	19	21	22
Total All Buildings	**13**	**18**	**22**	**27**	**26**	**30**	**34**	**38**	**41**	**45**
% of Forecast Sales	0.44%	0.58%	0.71%	0.83%	0.80%	0.89%	0.99%	1.08%	1.15%	1.23%

Incremental Market Potential

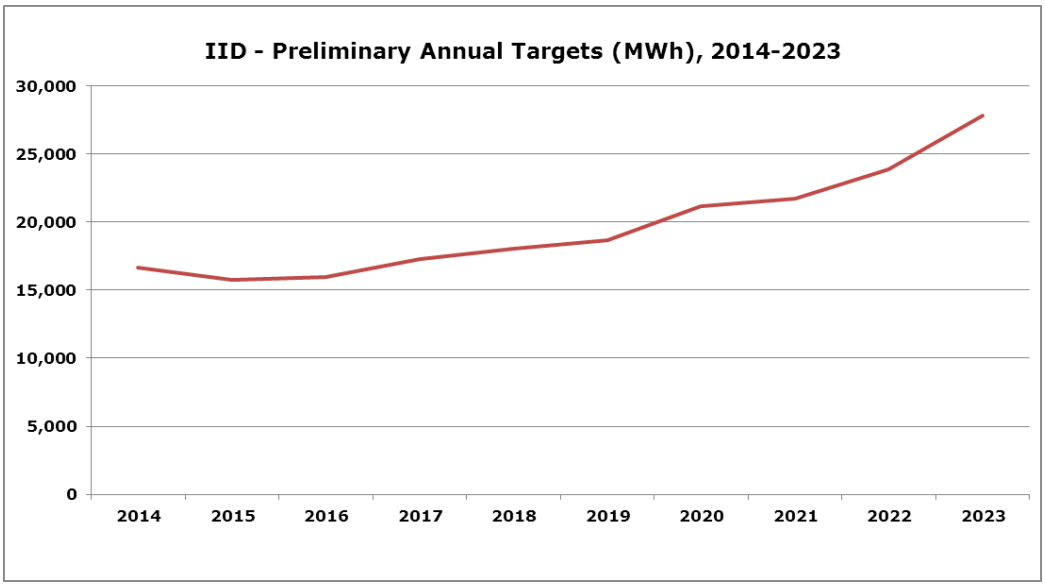
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5	5	6	7	4	4	4	5	5	5
Commercial	12	12	12	12	10	10	10	10	10	9
Industrial & Agriculture	9	10	11	11	11	11	11	11	11	11
Total All Buildings	**27**	**28**	**29**	**30**	**25**	**25**	**25**	**25**	**25**	**25**
% of Forecast Sales	**0.16%**	**0.16%**	**0.17%**	**0.16%**	**0.14%**	**0.13%**	**0.13%**	**0.13%**	**0.13%**	**0.13%**
Utility Re-Participation	0	0	0	0	0	0	0	0	1	1
Total All Buildings (includes Re-participation)	**27**	**28**	**29**	**30**	**25**	**25**	**25**	**26**	**27**	**27**
% of Sales with Re-Participation	**0.16%**	**0.16%**	**0.17%**	**0.17%**	**0.14%**	**0.14%**	**0.13%**	**0.13%**	**0.14%**	**0.13%**
Codes & Standards	**20**	**22**	**25**	**24**	**49**	**49**	**48**	**47**	**41**	**36**
Incremental & Codes and Standard Effects as % of Forecast	**0.28%**	**0.29%**	**0.31%**	**0.30%**	**0.40%**	**0.40%**	**0.39%**	**0.37%**	**0.34%**	**0.31%**

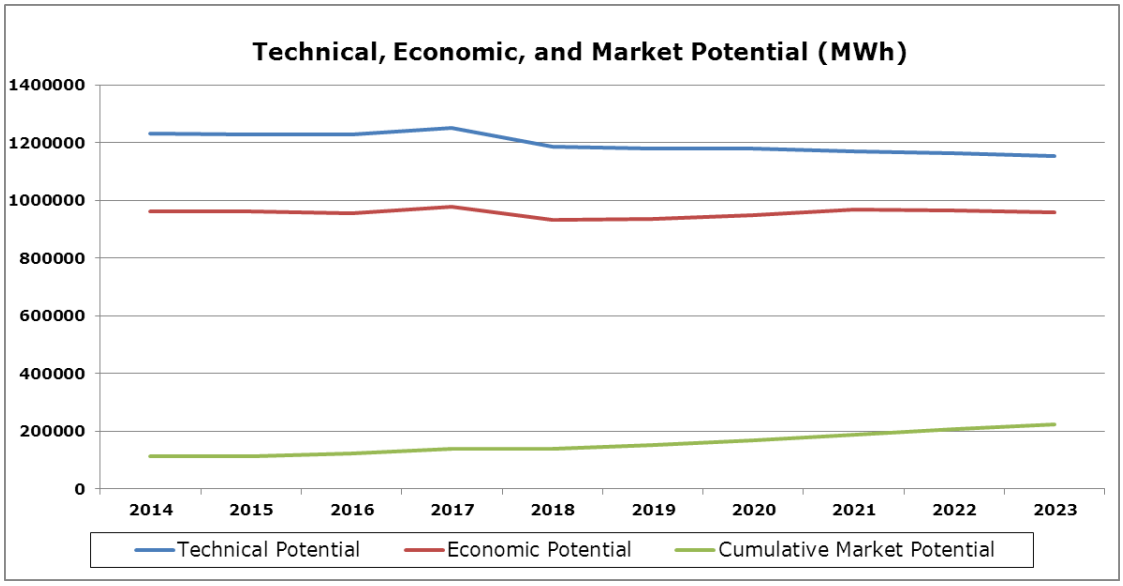
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	2	2	2	2	2	2	2	2	2	2
Industrial & Agriculture	2	2	2	2	2	2	2	2	2	2
Total All Buildings	**4**	**5**	**5**	**5**	**4**	**4**	**4**	**4**	**4**	**4**
% of Forecast Sales	**0.15%**	**0.15%**	**0.15%**	**0.15%**	**0.12%**	**0.12%**	**0.11%**	**0.11%**	**0.11%**	**0.11%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**4**	**5**	**5**	**5**	**4**	**4**	**4**	**4**	**4**	**4**
% of Sales with Re-Participation	**0.15%**	**0.15%**	**0.15%**	**0.15%**	**0.12%**	**0.12%**	**0.12%**	**0.11%**	**0.11%**	**0.11%**
Codes & Standards	**17**	**4**	**4**	**5**	**10**	**10**	**10**	**9**	**9**	**8**
Incremental & Codes and Standard Effects as % of Forecast	**0.70%**	**0.26%**	**0.29%**	**0.30%**	**0.42%**	**0.41%**	**0.40%**	**0.38%**	**0.35%**	**0.34%**

IMPERIAL IRRIGATION DISTRICT



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Preliminary Target (MWh)	**16,675**	**15,773**	**15,965**	**17,271**	**18,039**	**18,684**	**21,187**	**21,745**	**23,880**	**27,803**
Total Energy Use (GWh):	3,192.19	3,252.64	3,314.25	3,377.04	3,441.02	3,506.23	3,572.69	3,640.42	3,709.44	3,779.79
Residential Sector Energy Use (GWH):	1,599.87	1,630.17	1,661.05	1,692.52	1,724.59	1,757.27	1,790.58	1,824.52	1,859.11	1,894.37
Commercial Sector Energy Use (GWH):	1,504.87	1,533.37	1,562.41	1,592.01	1,622.17	1,652.92	1,684.25	1,716.17	1,748.71	1,781.88
Industrial Sector Energy Use (GWH):	87.45	89.10	90.79	92.51	94.27	96.05	97.87	99.73	101.62	103.55
Target as Percent of Total	***0.52%***	***0.48%***	***0.48%***	***0.51%***	***0.52%***	***0.53%***	***0.59%***	***0.60%***	***0.64%***	***0.74%***
Electric Demand										
Preliminary Target (MW)	**3.72**	**3.97**	**3.89**	**4.50**	**5.03**	**5.37**	**6.17**	**6.51**	**7.67**	**8.81**
Total Demand (MW):	1,004.00	1,004.00	1,004.00	1,004.00	1,004.00	1,004.00	1,004.00	1,004.00	1,004.00	1,004.00
Residential Demand (MW):	503.19	503.19	503.19	503.19	503.19	503.19	503.19	503.19	503.19	503.19
Commercial Demand (MW):	473.31	473.31	473.31	473.31	473.31	473.31	473.31	473.31	473.31	473.31
Industrial Demand (MW):	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50
Target as Percent of Total	***0.37%***	***0.40%***	***0.39%***	***0.45%***	***0.50%***	***0.54%***	***0.61%***	***0.65%***	***0.76%***	***0.88%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	430,614	413,540	403,986	405,163	374,765	371,445	372,304	370,561	368,830	367,142
Commercial	787,179	799,491	809,981	832,728	795,872	793,967	793,002	785,908	779,448	772,281
Industrial & Agriculture	13,561	13,520	13,474	13,584	13,694	13,974	14,259	14,539	14,824	15,115
Total All Buildings	**1,231,353**	**1,226,552**	**1,227,441**	**1,251,475**	**1,184,331**	**1,179,385**	**1,179,565**	**1,171,007**	**1,163,102**	**1,154,538**
% of Forecast Sales	38.57%	37.71%	37.04%	37.06%	34.42%	33.64%	33.02%	32.17%	31.36%	30.55%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	182,592	164,155	151,829	152,044	149,591	150,260	150,798	150,492	150,200	149,880
Commercial	173,648	173,832	175,573	180,072	172,647	172,419	172,429	171,034	169,803	168,384
Industrial & Agricultural	2,444	2,464	2,484	2,520	2,555	2,607	2,661	2,713	2,766	2,820
Total All Buildings	**358,683**	**340,451**	**329,886**	**334,635**	**324,794**	**325,286**	**325,888**	**324,239**	**322,769**	**321,085**
% of Forecast Sales	35.73%	33.91%	32.86%	33.33%	32.35%	32.40%	32.46%	32.29%	32.15%	31.98%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	239,213	229,206	212,597	219,362	203,581	208,913	221,710	247,265	247,006	246,829
Commercial	709,956	717,341	727,918	743,570	714,443	713,396	713,281	707,027	701,399	695,055
Industrial & Agriculture	13,232	13,185	12,811	13,073	13,340	13,613	13,891	14,164	14,575	15,068
Total All Buildings	**962,402**	**959,732**	**953,325**	**976,004**	**931,364**	**935,922**	**948,882**	**968,455**	**962,980**	**956,951**
% of Forecast Sales	30.15%	29.51%	28.76%	28.90%	27.07%	26.69%	26.56%	26.60%	25.96%	25.32%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	103,736	94,445	74,386	81,025	79,412	80,322	86,821	88,288	88,180	88,175
Commercial	145,617	145,621	147,786	151,060	145,298	145,358	145,653	144,540	143,588	142,446
Industrial & Agriculture	2,382	2,401	2,390	2,439	2,489	2,540	2,592	2,643	2,720	2,812
Total All Buildings	**251,735**	**242,468**	**224,562**	**234,524**	**227,199**	**228,220**	**235,066**	**235,471**	**234,488**	**233,433**
% of Forecast Sales	25.07%	24.15%	22.37%	23.36%	22.63%	22.73%	23.41%	23.45%	23.36%	23.25%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	48,216	42,265	43,519	49,611	47,473	50,758	58,256	66,622	75,322	84,113
Commercial	54,087	61,218	68,173	76,698	79,329	88,811	98,533	108,254	117,572	125,798
Industrial & Agriculture	8,872	9,503	10,104	10,664	10,964	11,418	11,529	11,955	12,318	12,655
Total All Buildings	**111,174**	**112,986**	**121,797**	**136,973**	**137,766**	**150,986**	**168,318**	**186,831**	**205,211**	**222,566**
% of Forecast Sales	3.48%	3.47%	3.67%	4.06%	4.00%	4.31%	4.71%	5.13%	5.53%	5.89%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	26,705	16,986	15,953	18,255	20,511	23,689	27,425	31,581	35,894	40,278
Commercial	12,720	13,968	15,428	17,147	17,613	19,474	21,345	23,201	24,972	26,485
Industrial & Agriculture	1,645	1,765	1,881	1,988	2,046	2,131	2,151	2,231	2,298	2,361
Total All Buildings	**41,070**	**32,719**	**33,263**	**37,390**	**40,170**	**45,293**	**50,921**	**57,013**	**63,164**	**69,124**
% of Forecast Sales	4.09%	3.26%	3.31%	3.72%	4.00%	4.51%	5.07%	5.68%	6.29%	6.88%

Incremental Market Potential

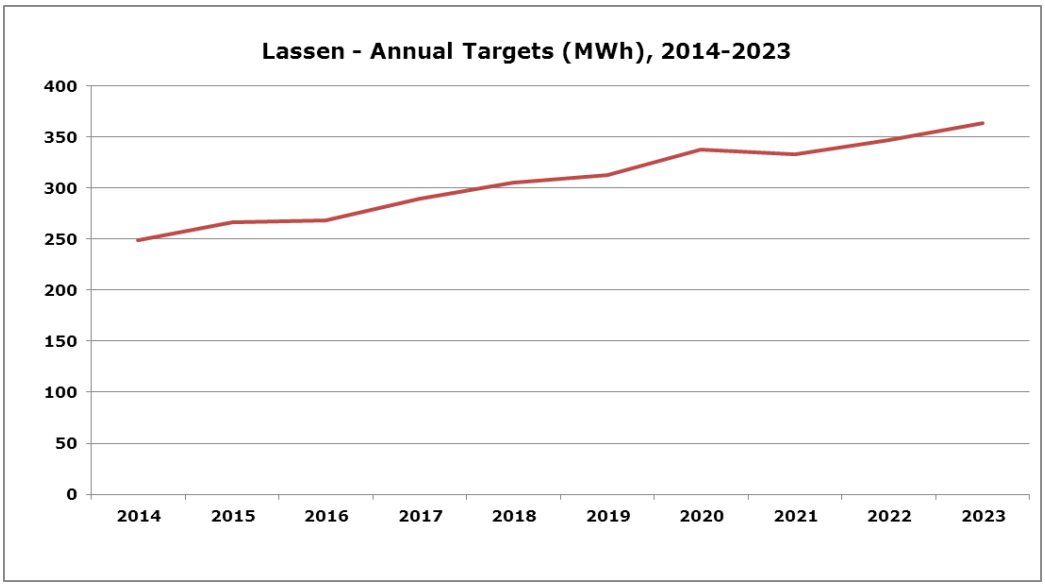
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,392	4,793	5,289	6,133	5,873	6,669	7,597	8,675	9,206	9,453
Commercial	9,424	9,516	9,625	9,903	9,528	9,788	9,948	9,940	9,757	9,350
Industrial & Agriculture	693	678	649	620	614	545	528	475	456	437
Total All Buildings	**14,508**	**14,986**	**15,563**	**16,656**	**16,014**	**17,001**	**18,073**	**19,091**	**19,419**	**19,240**
% of Forecast Sales	**0.45%**	**0.46%**	**0.47%**	**0.49%**	**0.47%**	**0.48%**	**0.51%**	**0.52%**	**0.52%**	**0.51%**
Utility Re-Participation	2,167	787	402	616	2,025	1,682	3,114	2,654	4,460	8,563
Total All Buildings (includes Re-participation)	**16,675**	**15,773**	**15,965**	**17,271**	**18,039**	**18,684**	**21,187**	**21,745**	**23,880**	**27,803**
% of Sales with Re-Participation	**0.52%**	**0.48%**	**0.48%**	**0.51%**	**0.52%**	**0.53%**	**0.59%**	**0.60%**	**0.64%**	**0.74%**
Codes & Standards	**7,626**	**11,243**	**13,906**	**14,202**	**19,449**	**19,389**	**19,036**	**18,391**	**15,719**	**13,700**
Incremental & Codes and Standard Effects as % of Forecast	**0.76%**	**0.83%**	**0.90%**	**0.93%**	**1.09%**	**1.09%**	**1.13%**	**1.10%**	**1.07%**	**1.10%**

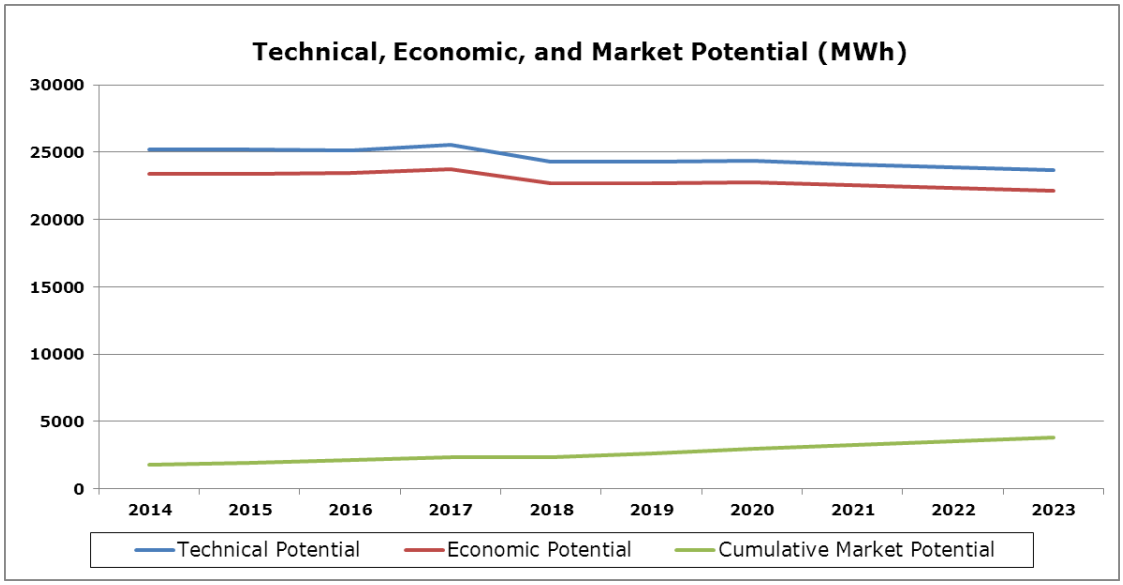
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,469	1,725	1,740	2,311	2,691	3,181	3,738	4,189	4,498	4,629
Commercial	2,015	2,000	1,979	1,987	1,866	1,885	1,899	1,892	1,863	1,795
Industrial & Agriculture	127	125	121	116	115	102	98	89	85	82
Total All Buildings	**3,610**	**3,850**	**3,840**	**4,414**	**4,672**	**5,168**	**5,736**	**6,170**	**6,446**	**6,506**
% of Forecast Sales	**0.36%**	**0.38%**	**0.38%**	**0.44%**	**0.47%**	**0.51%**	**0.57%**	**0.61%**	**0.64%**	**0.65%**
Utility Re-Participation	113	124	49	86	359	205	438	338	1,228	2,306
Total All Buildings (includes Re-participation)	**3,723**	**3,974**	**3,889**	**4,499**	**5,032**	**5,372**	**6,174**	**6,507**	**7,674**	**8,812**
% of Sales with Re-Participation	**0.37%**	**0.40%**	**0.39%**	**0.45%**	**0.50%**	**0.54%**	**0.61%**	**0.65%**	**0.76%**	**0.88%**
Codes & Standards	**3,853**	**5,128**	**6,528**	**6,625**	**7,346**	**7,284**	**7,224**	**6,559**	**5,045**	**4,265**
Incremental & Codes and Standard Effects as % of Forecast	**0.75%**	**0.91%**	**1.04%**	**1.11%**	**1.23%**	**1.26%**	**1.33%**	**1.30%**	**1.27%**	**1.30%**

LASSEN MUNICIPAL UTILITY DISTRICT



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**249**	**266**	**268**	**290**	**305**	**313**	**338**	**333**	**347**	**364**
Total Energy Use (GWh):	143.00	143.00	143.00	143.00	143.00	143.00	143.00	143.00	143.00	143.00
Residential Sector Energy Use (GWH):	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
Commercial Sector Energy Use (GWH):	70.07	70.07	70.07	70.07	70.07	70.07	70.07	70.07	70.07	70.07
Industrial Sector Energy Use (GWH):	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
Target as Percent of Total	***0.19%***	***0.20%***	***0.20%***	***0.21%***	***0.22%***	***0.23%***	***0.24%***	***0.24%***	***0.25%***	***0.26%***
Electric Demand										
Adopted Target (MW)	**0.07**	**0.08**	**0.08**	**0.08**	**0.09**	**0.09**	**0.10**	**0.10**	**0.11**	**0.13**
Total Demand (MW):	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00
Residential Demand (MW):	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00
Commercial Demand (MW):	12.74	12.74	12.74	12.74	12.74	12.74	12.74	12.74	12.74	12.74
Industrial Demand (MW):	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Target as Percent of Total	***0.28%***	***0.30%***	***0.30%***	***0.33%***	***0.34%***	***0.36%***	***0.38%***	***0.39%***	***0.41%***	***0.48%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	334	329	329	335	299	296	300	298	297	296
Commercial	24,844	24,840	24,824	25,222	24,017	24,021	24,043	23,808	23,601	23,353
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**25,177**	**25,168**	**25,153**	**25,557**	**24,315**	**24,317**	**24,343**	**24,107**	**23,899**	**23,650**
% of Forecast Sales	17.61%	17.60%	17.59%	17.87%	17.00%	17.00%	17.02%	16.86%	16.71%	16.54%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	155	145	134	141	144	151	157	161	164	168
Commercial	6,742	6,523	6,520	6,629	6,425	6,472	6,523	6,472	6,431	6,377
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**6,898**	**6,667**	**6,654**	**6,771**	**6,569**	**6,622**	**6,680**	**6,633**	**6,595**	**6,544**
% of Forecast Sales	26.53%	25.64%	25.59%	26.04%	25.27%	25.47%	25.69%	25.51%	25.37%	25.17%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	318	316	314	321	281	283	288	290	285	288
Commercial	23,092	23,047	23,138	23,425	22,393	22,412	22,476	22,257	22,066	21,835
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**23,410**	**23,363**	**23,452**	**23,746**	**22,674**	**22,695**	**22,763**	**22,547**	**22,352**	**22,123**
% of Forecast Sales	16.37%	16.34%	16.40%	16.61%	15.86%	15.87%	15.92%	15.77%	15.63%	15.47%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	135	128	116	125	128	134	141	150	148	157
Commercial	5,675	5,426	5,477	5,574	5,422	5,478	5,545	5,506	5,474	5,430
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**5,810**	**5,554**	**5,593**	**5,699**	**5,549**	**5,612**	**5,686**	**5,655**	**5,622**	**5,587**
% of Forecast Sales	22.34%	21.36%	21.51%	21.92%	21.34%	21.59%	21.87%	21.75%	21.62%	21.49%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	830	802	794	790	658	654	658	671	680	676
Commercial	938	1,129	1,333	1,575	1,706	1,984	2,274	2,568	2,856	3,135
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**1,768**	**1,930**	**2,126**	**2,365**	**2,364**	**2,638**	**2,932**	**3,239**	**3,536**	**3,810**
% of Forecast Sales	1.24%	1.35%	1.49%	1.65%	1.65%	1.85%	2.05%	2.26%	2.47%	2.66%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	556	508	470	487	495	517	537	559	578	583
Commercial	215	255	302	359	397	464	535	608	681	752
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**771**	**763**	**772**	**847**	**891**	**981**	**1,073**	**1,167**	**1,259**	**1,335**
% of Forecast Sales	2.97%	2.94%	2.97%	3.26%	3.43%	3.77%	4.13%	4.49%	4.84%	5.14%

Incremental Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	35	31	30	30	26	25	25	24	24	23
Commercial	211	230	248	267	269	284	296	302	302	294
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**246**	**260**	**278**	**297**	**294**	**309**	**321**	**326**	**326**	**318**
% of Forecast Sales	**0.17%**	**0.18%**	**0.19%**	**0.21%**	**0.21%**	**0.22%**	**0.22%**	**0.23%**	**0.23%**	**0.22%**
Utility Re-Participation	22	20	3	5	24	15	29	18	32	56
Total All Buildings (includes Re-participation)	**268**	**280**	**281**	**303**	**318**	**324**	**350**	**344**	**358**	**374**
% of Sales with Re-Participation	**0.19%**	**0.20%**	**0.20%**	**0.21%**	**0.22%**	**0.23%**	**0.24%**	**0.24%**	**0.25%**	**0.26%**
Codes & Standards	**123**	**165**	**225**	**241**	**304**	**301**	**298**	**294**	**244**	**231**
Incremental & Codes and Standard Effects as % of Forecast	**0.27%**	**0.31%**	**0.35%**	**0.38%**	**0.44%**	**0.44%**	**0.45%**	**0.45%**	**0.42%**	**0.42%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	26	26	22	23	24	24	24	24	23	23
Commercial	49	53	57	62	64	69	72	75	75	74
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**75**	**78**	**80**	**86**	**88**	**92**	**96**	**98**	**99**	**97**
% of Forecast Sales	**0.29%**	**0.30%**	**0.31%**	**0.33%**	**0.34%**	**0.35%**	**0.37%**	**0.38%**	**0.38%**	**0.37%**
Utility Re-Participation	1	3	0	0	2	2	4	4	8	29
Total All Buildings (includes Re-participation)	**76**	**81**	**80**	**86**	**90**	**94**	**100**	**102**	**107**	**126**
% of Sales with Re-Participation	**0.29%**	**0.31%**	**0.31%**	**0.33%**	**0.35%**	**0.36%**	**0.38%**	**0.39%**	**0.41%**	**0.49%**
Codes & Standards	**118**	**39**	**56**	**61**	**74**	**74**	**73**	**72**	**63**	**61**
Incremental & Codes and Standard Effects as % of Forecast	**0.75%**	**0.46%**	**0.53%**	**0.56%**	**0.63%**	**0.65%**	**0.66%**	**0.67%**	**0.65%**	**0.72%**

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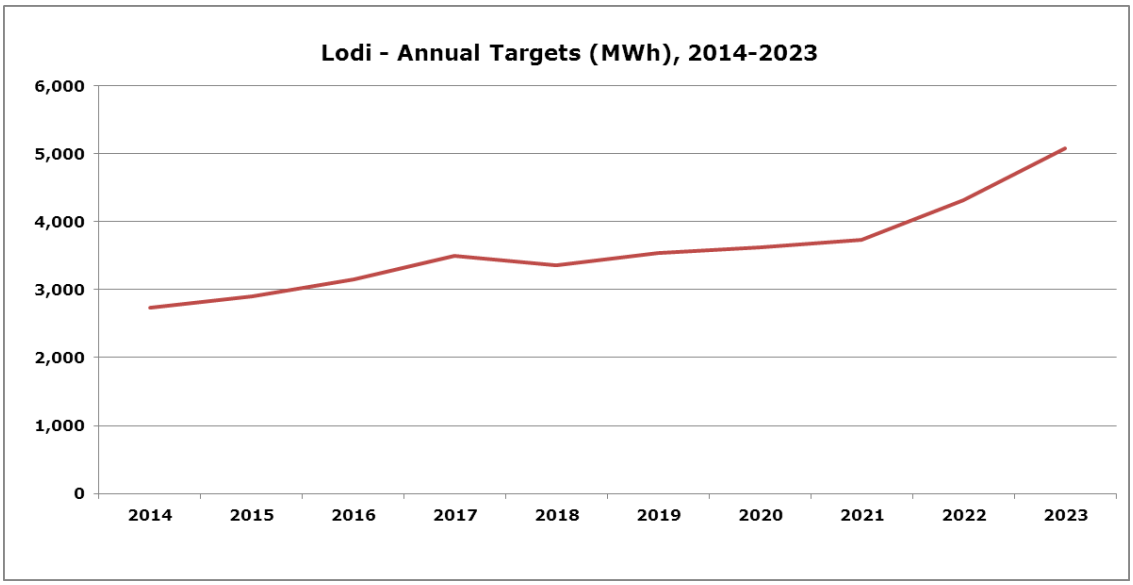
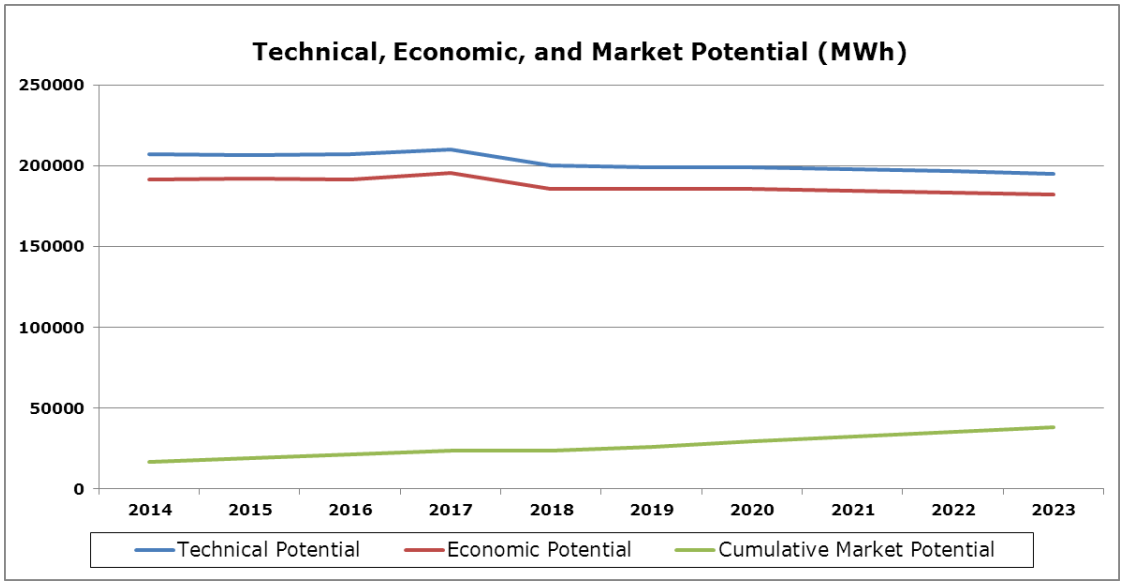


Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**2,735**	**2,904**	**3,155**	**3,492**	**3,359**	**3,543**	**3,617**	**3,737**	**4,311**	**5,081**
Total Energy Use (GWh):	447.75	453.99	457.24	450.30	452.16	455.02	456.88	459.99	463.12	466.27
Residential Sector Energy Use (GWH):	153.75	155.89	157.00	154.62	155.26	156.24	156.88	157.95	159.02	160.11
Commercial Sector Energy Use (GWH):	157.56	159.76	160.90	158.46	159.11	160.12	160.77	161.87	162.97	164.08
Industrial Sector Energy Use (GWH):	136.44	138.34	139.33	137.22	137.79	138.66	139.23	140.17	141.13	142.08
Target as Percent of Total	***0.61%***	***0.64%***	***0.69%***	***0.78%***	***0.74%***	***0.78%***	***0.79%***	***0.81%***	***0.93%***	***1.09%***
Electric Demand										
Adopted Target (MW)	**0.67**	**0.73**	**0.76**	**0.89**	**0.93**	**1.02**	**1.10**	**1.17**	**1.42**	**1.65**
Total Demand (MW):	120.18	122.32	124.51	126.73	128.99	131.29	133.64	136.02	138.45	140.92
Residential Demand (MW):	41.27	42.00	42.75	43.52	44.29	45.08	45.89	46.71	47.54	48.39
Commercial Demand (MW):	42.29	43.04	43.81	44.60	45.39	46.20	47.03	47.87	48.72	49.59
Industrial Demand (MW):	36.62	37.28	37.94	38.62	39.31	40.01	40.72	41.45	42.19	42.94
Target as Percent of Total	***0.55%***	***0.60%***	***0.61%***	***0.70%***	***0.72%***	***0.78%***	***0.82%***	***0.86%***	***1.02%***	***1.17%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	70,657	67,791	66,258	66,257	60,424	59,593	59,559	59,234	58,907	58,578
Commercial	113,659	115,934	117,910	121,643	117,352	117,026	116,817	115,716	114,688	113,588
Industrial & Agriculture	22,933	22,922	22,753	22,258	22,200	22,369	22,489	22,656	22,823	22,992
Total All Buildings	**207,249**	**206,646**	**206,921**	**210,158**	**199,975**	**198,988**	**198,865**	**197,605**	**196,418**	**195,158**
% of Forecast Sales	46.29%	45.52%	45.25%	46.67%	44.23%	43.73%	43.53%	42.96%	42.41%	41.86%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	33,662	29,784	27,342	27,310	26,716	26,651	26,686	26,635	26,586	26,524
Commercial	26,089	26,159	26,455	27,213	26,415	26,416	26,447	26,235	26,042	25,829
Industrial & Agricultural	4,180	4,210	4,212	4,137	4,142	4,174	4,196	4,228	4,259	4,290
Total All Buildings	**63,931**	**60,154**	**58,009**	**58,660**	**57,273**	**57,242**	**57,330**	**57,098**	**56,887**	**56,643**
% of Forecast Sales	53.20%	49.18%	46.59%	46.29%	44.40%	43.60%	42.90%	41.98%	41.09%	40.19%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	64,224	62,075	60,103	61,097	54,548	54,471	54,355	54,008	53,657	53,306
Commercial	104,706	107,049	109,493	112,727	109,118	108,879	108,755	107,739	106,795	105,778
Industrial & Agriculture	22,622	22,606	22,073	21,766	21,885	22,231	22,351	22,517	22,683	22,973
Total All Buildings	**191,551**	**191,730**	**191,669**	**195,590**	**185,551**	**185,581**	**185,461**	**184,264**	**183,135**	**182,057**
% of Forecast Sales	42.78%	42.23%	41.92%	43.44%	41.04%	40.79%	40.59%	40.06%	39.54%	39.05%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	25,052	22,399	19,096	20,635	19,823	19,771	19,712	19,655	19,589	19,523
Commercial	22,159	22,392	22,867	23,560	22,933	22,971	23,038	22,862	22,705	22,526
Industrial & Agriculture	4,122	4,151	4,119	4,062	4,084	4,148	4,171	4,202	4,233	4,287
Total All Buildings	**51,333**	**48,942**	**46,082**	**48,257**	**46,840**	**46,890**	**46,921**	**46,718**	**46,526**	**46,336**
% of Forecast Sales	42.71%	40.01%	37.01%	38.08%	36.31%	35.71%	35.11%	34.35%	33.60%	32.88%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,630	4,579	5,640	6,648	6,053	7,084	8,473	9,965	11,495	13,040
Commercial	10,553	11,112	11,683	12,549	12,480	13,594	14,727	15,860	16,940	17,839
Industrial & Agriculture	2,609	3,143	3,678	4,249	4,783	5,356	5,900	6,420	6,881	7,327
Total All Buildings	**16,791**	**18,833**	**21,000**	**23,445**	**23,316**	**26,035**	**29,100**	**32,246**	**35,317**	**38,206**
% of Forecast Sales	3.75%	4.15%	4.59%	5.21%	5.16%	5.72%	6.37%	7.01%	7.63%	8.19%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	745	1,015	1,332	1,765	2,090	2,666	3,343	4,094	4,877	5,693
Commercial	2,299	2,408	2,530	2,712	2,705	2,936	3,170	3,404	3,631	3,811
Industrial & Agriculture	460	568	677	788	892	999	1,101	1,198	1,284	1,367
Total All Buildings	**3,505**	**3,991**	**4,539**	**5,265**	**5,688**	**6,601**	**7,614**	**8,696**	**9,792**	**10,871**
% of Forecast Sales	2.92%	3.26%	3.65%	4.15%	4.41%	5.03%	5.70%	6.39%	7.07%	7.71%

Incremental Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	982	1,109	1,222	1,382	1,302	1,434	1,558	1,656	1,722	1,747
Commercial	1,004	1,051	1,090	1,132	1,108	1,137	1,157	1,164	1,156	1,132
Industrial & Agriculture	608	634	640	635	604	587	569	550	535	521
Total All Buildings	**2,594**	**2,794**	**2,953**	**3,150**	**3,014**	**3,157**	**3,284**	**3,370**	**3,413**	**3,400**
% of Forecast Sales	**0.58%**	**0.62%**	**0.65%**	**0.70%**	**0.67%**	**0.69%**	**0.72%**	**0.73%**	**0.74%**	**0.73%**
Utility Re-Participation	141	110	202	342	345	385	333	367	898	1,680
Total All Buildings (includes Re-participation)	**2,735**	**2,904**	**3,155**	**3,492**	**3,359**	**3,543**	**3,617**	**3,737**	**4,311**	**5,081**
% of Sales with Re-Participation	**0.61%**	**0.64%**	**0.69%**	**0.78%**	**0.74%**	**0.78%**	**0.79%**	**0.81%**	**0.93%**	**1.09%**
Codes & Standards	**1,210**	**1,738**	**2,075**	**2,078**	**2,828**	**2,825**	**2,768**	**2,638**	**2,275**	**1,945**
Incremental & Codes and Standard Effects as % of Forecast	**0.88%**	**1.02%**	**1.14%**	**1.24%**	**1.37%**	**1.40%**	**1.40%**	**1.39%**	**1.42%**	**1.51%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	317	364	384	486	541	622	701	774	834	873
Commercial	223	229	234	238	231	235	238	240	240	235
Industrial & Agriculture	111	117	119	119	113	110	106	103	100	97
Total All Buildings	**652**	**711**	**737**	**843**	**884**	**966**	**1,046**	**1,117**	**1,173**	**1,206**
% of Forecast Sales	**0.54%**	**0.58%**	**0.59%**	**0.67%**	**0.69%**	**0.74%**	**0.78%**	**0.82%**	**0.85%**	**0.86%**
Utility Re-Participation	15	18	23	42	44	56	53	58	244	444
Total All Buildings (includes Re-participation)	**667**	**728**	**760**	**885**	**928**	**1,022**	**1,098**	**1,175**	**1,417**	**1,650**
% of Sales with Re-Participation	**0.55%**	**0.60%**	**0.61%**	**0.70%**	**0.72%**	**0.78%**	**0.82%**	**0.86%**	**1.02%**	**1.17%**
Codes & Standards	**776**	**1,060**	**1,299**	**1,309**	**1,407**	**1,402**	**1,393**	**1,239**	**915**	**717**
Incremental & Codes and Standard Effects as % of Forecast	**1.20%**	**1.46%**	**1.65%**	**1.73%**	**1.81%**	**1.85%**	**1.86%**	**1.77%**	**1.68%**	**1.68%**

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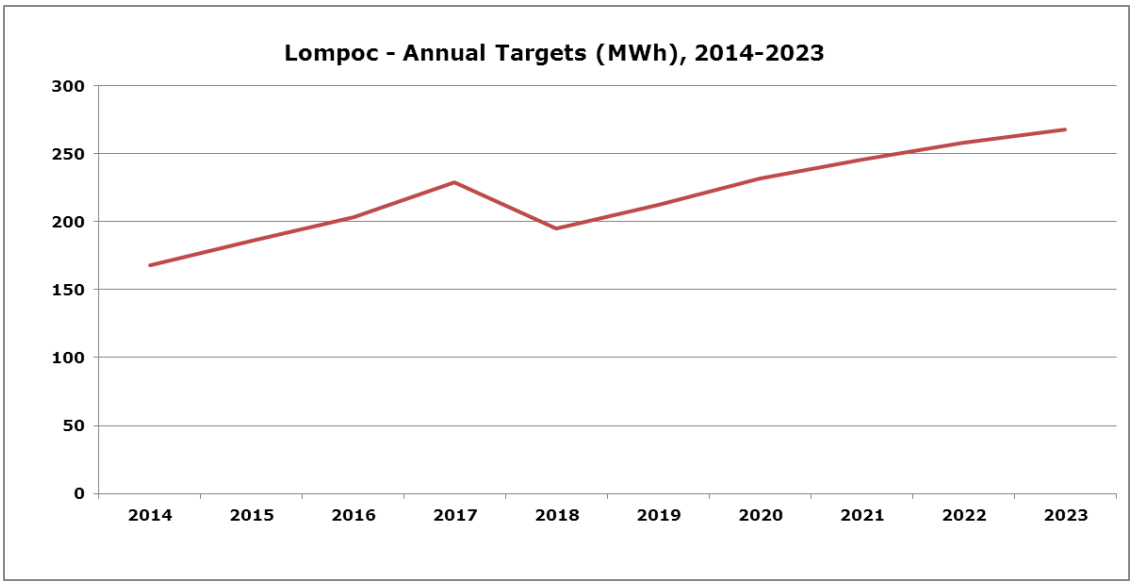
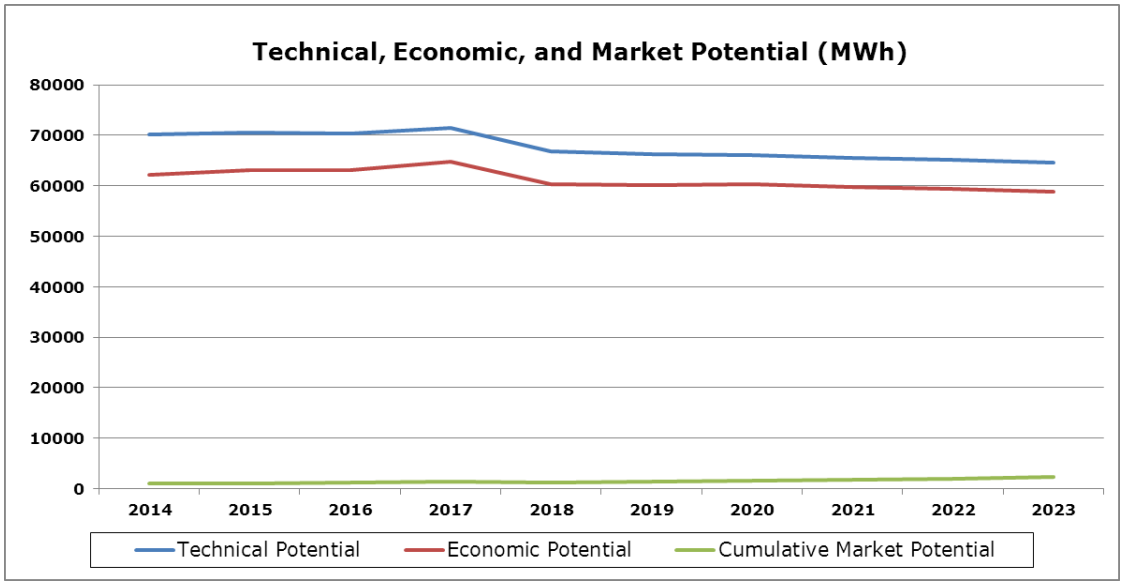


Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**168**	**186**	**203**	**229**	**195**	**212**	**232**	**246**	**258**	**268**
Total Energy Use (GWh):	132.39	133.41	134.59	134.85	134.42	134.42	134.42	134.42	134.42	134.42
Residential Sector Energy Use (GWH):	58.21	58.66	59.18	59.29	59.10	59.10	59.10	59.10	59.10	59.10
Commercial Sector Energy Use (GWH):	30.67	30.91	31.18	31.18	31.14	31.14	31.14	31.14	31.14	31.14
Industrial Sector Energy Use (GWH):	43.51	43.84	44.23	44.23	44.17	44.17	44.17	44.17	44.17	44.17
Target as Percent of Total	***0.13%***	***0.14%***	***0.15%***	***0.17%***	***0.15%***	***0.16%***	***0.17%***	***0.18%***	***0.19%***	***0.20%***
Electric Demand										
Adopted Target (MW)	**0.02**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**
Total Demand (MW):	23.50	23.90	24.10	24.30	23.90	23.90	23.90	23.90	23.90	23.90
Residential Demand (MW):	10.30	10.50	10.60	10.70	10.50	10.50	10.50	10.50	10.50	10.50
Commercial Demand (MW):	5.40	5.50	5.60	5.60	5.50	5.50	5.50	5.50	5.50	5.50
Industrial Demand (MW):	7.70	7.80	7.90	8.00	7.80	7.80	7.80	7.80	7.80	7.80
Target as Percent of Total	***0.10%***	***0.11%***	***0.11%***	***0.13%***	***0.11%***	***0.12%***	***0.13%***	***0.13%***	***0.14%***	***0.14%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	22,621	21,710	20,467	19,782	16,957	16,583	16,598	16,482	16,367	16,251
Commercial	40,382	41,646	42,779	44,587	42,979	42,773	42,587	42,163	41,776	41,344
Industrial & Agriculture	7,249	7,160	7,079	7,011	6,933	6,943	6,952	6,956	6,960	6,964
Total All Buildings	**70,251**	**70,516**	**70,325**	**71,380**	**66,870**	**66,298**	**66,136**	**65,601**	**65,104**	**64,559**
% of Forecast Sales	53.06%	52.86%	52.25%	52.93%	49.75%	49.32%	49.20%	48.80%	48.43%	48.03%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6,636	5,440	4,624	4,547	4,265	4,262	4,259	4,241	4,224	4,210
Commercial	8,771	8,891	9,061	9,418	9,106	9,082	9,062	8,979	8,905	8,820
Industrial & Agricultural	1,310	1,308	1,306	1,301	1,294	1,295	1,297	1,298	1,299	1,300
Total All Buildings	**16,717**	**15,639**	**14,991**	**15,267**	**14,665**	**14,640**	**14,618**	**14,518**	**14,428**	**14,329**
% of Forecast Sales	71.14%	65.43%	62.20%	62.83%	61.36%	61.25%	61.16%	60.75%	60.37%	59.95%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	19,695	19,385	18,371	17,943	14,826	14,736	14,823	14,710	14,596	14,482
Commercial	35,333	36,713	38,007	40,045	38,738	38,577	38,675	38,293	37,947	37,555
Industrial & Agriculture	7,076	6,986	6,749	6,758	6,758	6,768	6,777	6,781	6,785	6,789
Total All Buildings	**62,104**	**63,084**	**63,127**	**64,746**	**60,323**	**60,081**	**60,275**	**59,784**	**59,328**	**58,826**
% of Forecast Sales	46.91%	47.29%	46.90%	48.01%	44.88%	44.70%	44.84%	44.48%	44.14%	43.76%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,457	3,014	2,395	2,642	2,338	2,326	2,310	2,297	2,281	2,266
Commercial	7,179	7,381	7,636	8,150	7,903	7,891	7,905	7,834	7,772	7,699
Industrial & Agriculture	1,278	1,275	1,259	1,261	1,261	1,263	1,265	1,265	1,266	1,267
Total All Buildings	**11,915**	**11,670**	**11,291**	**12,053**	**11,502**	**11,480**	**11,480**	**11,396**	**11,320**	**11,232**
% of Forecast Sales	50.70%	48.83%	46.85%	49.60%	48.13%	48.03%	48.03%	47.68%	47.36%	46.99%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	523	535	630	712	580	663	764	872	987	1,106
Commercial	415	471	529	606	612	702	802	905	1,012	1,121
Industrial & Agriculture	27	27	26	27	28	32	35	39	43	46
Total All Buildings	**965**	**1,034**	**1,184**	**1,345**	**1,220**	**1,397**	**1,601**	**1,816**	**2,042**	**2,274**
% of Forecast Sales	0.73%	0.77%	0.88%	1.00%	0.91%	1.04%	1.19%	1.35%	1.52%	1.69%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	76	74	83	88	68	75	82	89	97	105
Commercial	73	83	93	108	109	127	146	166	187	208
Industrial & Agriculture	4	4	4	5	5	6	7	7	8	9
Total All Buildings	**154**	**162**	**180**	**201**	**182**	**207**	**234**	**262**	**292**	**322**
% of Forecast Sales	0.65%	0.68%	0.75%	0.83%	0.76%	0.87%	0.98%	1.10%	1.22%	1.35%

Incremental Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	89	105	120	134	104	114	124	133	140	146
Commercial	73	77	79	91	87	93	102	107	112	115
Industrial & Agriculture	5	4	3	4	4	4	4	4	4	4
Total All Buildings	**167**	**186**	**203**	**229**	**195**	**211**	**230**	**244**	**256**	**265**
% of Forecast Sales	**0.13%**	**0.14%**	**0.15%**	**0.17%**	**0.14%**	**0.16%**	**0.17%**	**0.18%**	**0.19%**	**0.20%**
Utility Re-Participation	1	1	0	1	1	1	2	2	2	3
Total All Buildings (includes Re-participation)	**168**	**186**	**203**	**229**	**195**	**212**	**232**	**246**	**258**	**268**
% of Sales with Re-Participation	**0.13%**	**0.14%**	**0.15%**	**0.17%**	**0.15%**	**0.16%**	**0.17%**	**0.18%**	**0.19%**	**0.20%**
Codes & Standards	**506**	**653**	**643**	**632**	**985**	**982**	**954**	**913**	**794**	**686**
Incremental & Codes and Standard Effects as % of Forecast	**0.51%**	**0.63%**	**0.63%**	**0.64%**	**0.88%**	**0.89%**	**0.88%**	**0.86%**	**0.78%**	**0.71%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	10	11	12	13	9	9	10	10	11	11
Commercial	13	14	14	17	17	18	20	21	22	23
Industrial & Agriculture	1	1	1	1	1	1	1	1	1	1
Total All Buildings	**24**	**25**	**27**	**31**	**26**	**28**	**30**	**32**	**33**	**34**
% of Forecast Sales	**0.10%**	**0.11%**	**0.11%**	**0.13%**	**0.11%**	**0.12%**	**0.13%**	**0.13%**	**0.14%**	**0.14%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**24**	**25**	**27**	**31**	**26**	**28**	**30**	**32**	**33**	**34**
% of Sales with Re-Participation	**0.10%**	**0.11%**	**0.11%**	**0.13%**	**0.11%**	**0.12%**	**0.13%**	**0.13%**	**0.14%**	**0.14%**
Codes & Standards	**263**	**333**	**314**	**315**	**359**	**354**	**350**	**316**	**243**	**199**
Incremental & Codes and Standard Effects as % of Forecast	**1.22%**	**1.50%**	**1.41%**	**1.43%**	**1.61%**	**1.60%**	**1.59%**	**1.46%**	**1.16%**	**0.98%**

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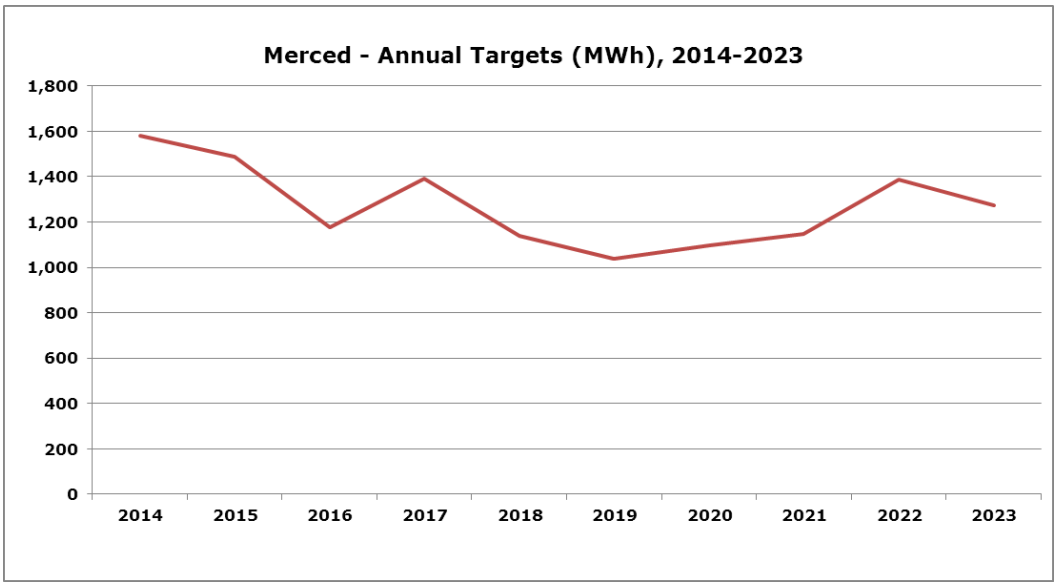
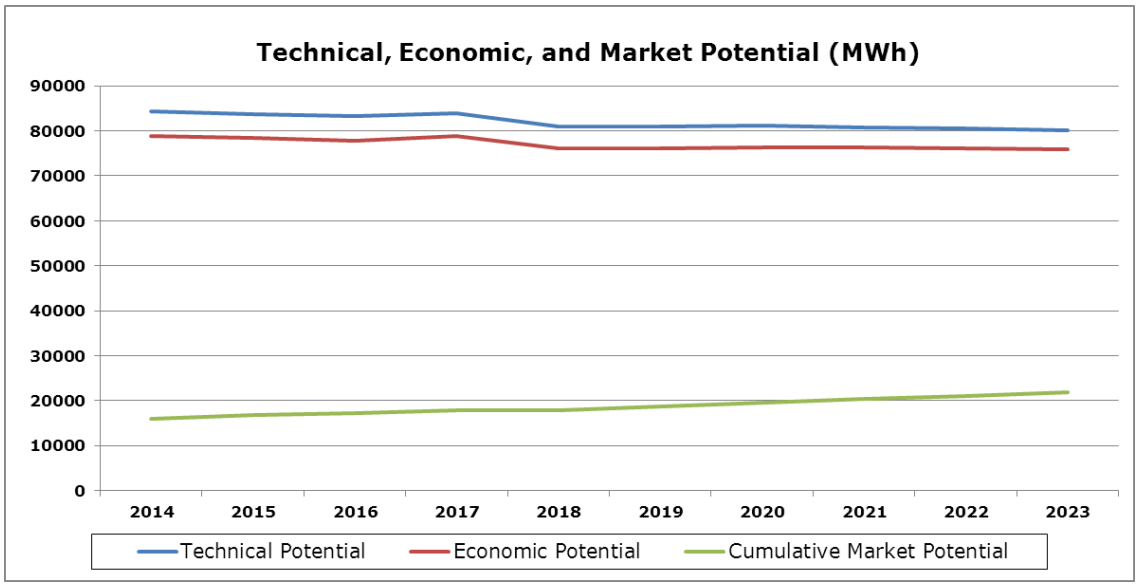


Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**1,581**	**1,486**	**1,179**	**1,392**	**1,140**	**1,040**	**1,099**	**1,148**	**1,386**	**1,274**
Total Energy Use (GWh):	460.21	463.70	467.21	470.76	474.33	477.94	481.58	485.25	488.95	492.73
Residential Sector Energy Use (GWH):	55.80	56.29	56.79	57.29	57.79	58.29	58.79	59.29	59.79	60.34
Commercial Sector Energy Use (GWH):	176.50	178.27	180.05	181.85	183.67	185.51	187.36	189.23	191.13	193.04
Industrial Sector Energy Use (GWH):	117.32	118.49	119.68	120.87	122.08	123.30	124.54	125.78	127.04	128.31
Target as Percent of Total	***0.34%***	***0.32%***	***0.25%***	***0.30%***	***0.24%***	***0.22%***	***0.23%***	***0.24%***	***0.28%***	***0.26%***
Electric Demand										
Adopted Target (MW)	**0.36**	**0.31**	**0.28**	**0.34**	**0.31**	**0.29**	**0.30**	**0.33**	**0.42**	**0.40**
Total Demand (MW):	965.49	975.32	985.25	995.27	1,005.38	1,015.57	1,025.87	1,036.26	1,046.74	1,057.43
Residential Demand (MW):	117.05	118.41	119.76	121.13	122.49	123.86	125.24	126.61	127.99	129.50
Commercial Demand (MW):	426.06	430.32	434.62	438.97	443.37	447.79	452.27	456.79	461.36	465.98
Industrial Demand (MW):	251.73	254.25	256.79	259.36	261.95	264.57	267.21	269.89	272.59	275.32
Target as Percent of Total	***0.04%***	***0.03%***	***0.03%***	***0.03%***	***0.03%***	***0.03%***	***0.03%***	***0.03%***	***0.04%***	***0.04%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	22,108	21,282	20,787	20,787	19,055	18,799	18,784	18,685	18,587	18,489
Commercial	42,432	42,609	42,771	43,503	42,133	42,063	42,037	41,621	41,289	40,827
Industrial	19,819	19,746	19,671	19,742	19,812	20,036	20,262	20,477	20,694	20,913
Total All Buildings	**84,359**	**83,638**	**83,230**	**84,031**	**81,000**	**80,899**	**81,084**	**80,783**	**80,571**	**80,229**
% of Forecast Sales	18.33%	18.04%	17.81%	17.85%	17.08%	16.93%	16.84%	16.65%	16.48%	16.28%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	10,306	9,135	8,372	8,372	8,188	8,169	8,174	8,152	8,137	8,112
Commercial	10,755	10,250	10,274	10,433	10,189	10,202	10,227	10,140	10,076	9,975
Industrial	3,616	3,630	3,643	3,670	3,697	3,739	3,781	3,821	3,862	3,902
Total All Buildings	**24,677**	**23,014**	**22,289**	**22,475**	**22,075**	**22,110**	**22,182**	**22,113**	**22,075**	**21,990**
% of Forecast Sales	2.56%	2.36%	2.26%	2.26%	2.20%	2.18%	2.16%	2.13%	2.11%	2.08%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	20,085	19,620	18,983	19,264	17,323	17,253	17,278	17,173	17,067	16,961
Commercial	39,262	39,382	39,634	40,171	39,130	39,092	39,097	38,712	38,411	37,979
Industrial	19,595	19,520	19,144	19,361	19,580	19,801	20,025	20,381	20,597	20,913
Total All Buildings	**78,942**	**78,522**	**77,761**	**78,796**	**76,032**	**76,146**	**76,401**	**76,267**	**76,075**	**75,853**
% of Forecast Sales	17.15%	16.93%	16.64%	16.74%	16.03%	15.93%	15.86%	15.72%	15.56%	15.39%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,276	6,741	5,748	6,177	5,935	5,957	5,940	5,923	5,903	5,884
Commercial	9,189	8,725	8,786	8,914	8,748	8,776	8,816	8,744	8,695	8,608
Industrial	3,575	3,587	3,572	3,613	3,654	3,695	3,737	3,803	3,843	3,902
Total All Buildings	**20,039**	**19,053**	**18,106**	**18,704**	**18,337**	**18,429**	**18,493**	**18,470**	**18,442**	**18,394**
% of Forecast Sales	2.08%	1.95%	1.84%	1.88%	1.82%	1.81%	1.80%	1.78%	1.76%	1.74%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,115	1,212	1,381	1,620	1,532	1,790	2,113	2,459	2,817	3,194
Commercial	10,016	10,355	10,623	10,994	11,014	11,466	11,914	12,354	12,621	12,930
Industrial	4,896	5,114	5,238	5,245	5,302	5,417	5,523	5,597	5,658	5,726
Total All Buildings	**16,026**	**16,681**	**17,242**	**17,859**	**17,847**	**18,674**	**19,550**	**20,410**	**21,097**	**21,851**
% of Forecast Sales	3.48%	3.60%	3.69%	3.79%	3.76%	3.91%	4.06%	4.21%	4.31%	4.43%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	317	354	395	507	595	736	897	1,074	1,256	1,449
Commercial	2,163	2,229	2,292	2,376	2,381	2,472	2,560	2,646	2,681	2,735
Industrial	882	932	966	973	989	1,011	1,031	1,044	1,056	1,069
Total All Buildings	**3,362**	**3,514**	**3,653**	**3,855**	**3,965**	**4,218**	**4,488**	**4,764**	**4,993**	**5,253**
% of Forecast Sales	0.35%	0.36%	0.37%	0.39%	0.39%	0.42%	0.44%	0.46%	0.48%	0.50%

Incremental Market Potential

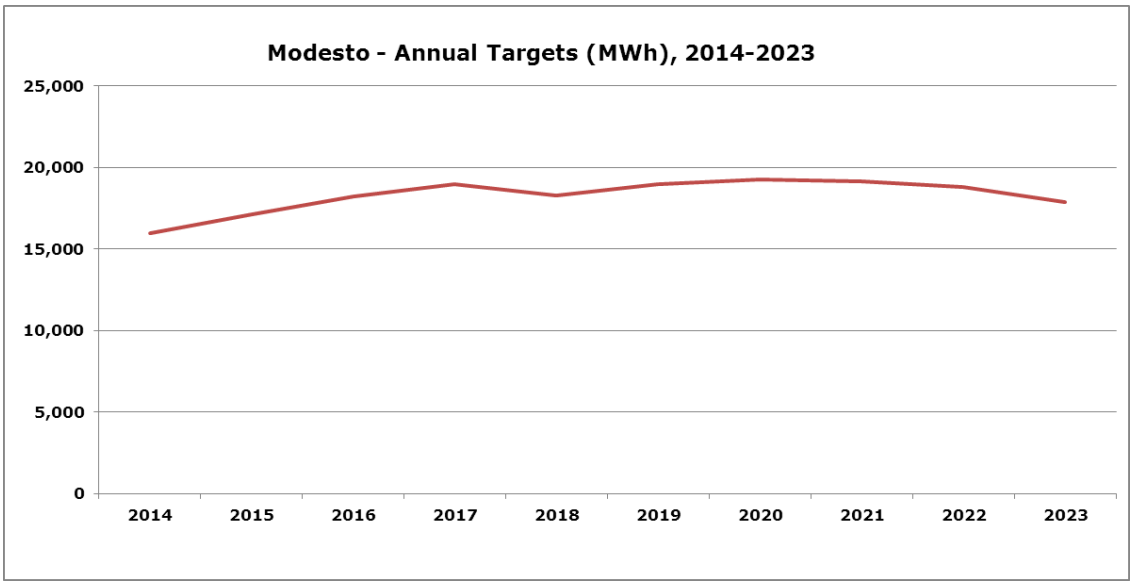
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	155	190	218	259	273	305	337	364	387	404
Commercial	698	638	582	544	491	476	466	460	466	447
Industrial	442	341	262	256	185	151	141	162	129	121
Total All Buildings	**1,295**	**1,168**	**1,063**	**1,059**	**949**	**932**	**944**	**986**	**981**	**972**
% of Forecast Sales	**0.28%**	**0.25%**	**0.23%**	**0.22%**	**0.20%**	**0.19%**	**0.20%**	**0.20%**	**0.20%**	**0.20%**
Utility Re-Participation	286	318	116	334	191	108	155	162	405	302
Total All Buildings (includes Re-participation)	**1,581**	**1,486**	**1,179**	**1,392**	**1,140**	**1,040**	**1,099**	**1,148**	**1,386**	**1,274**
% of Sales with Re-Participation	**0.34%**	**0.32%**	**0.25%**	**0.30%**	**0.24%**	**0.22%**	**0.23%**	**0.24%**	**0.28%**	**0.26%**
Codes & Standards	**418**	**542**	**650**	**660**	**881**	**880**	**862**	**823**	**718**	**610**
Incremental & Codes and Standard Effects as % of Forecast	**0.43%**	**0.44%**	**0.39%**	**0.44%**	**0.43%**	**0.40%**	**0.41%**	**0.41%**	**0.43%**	**0.38%**

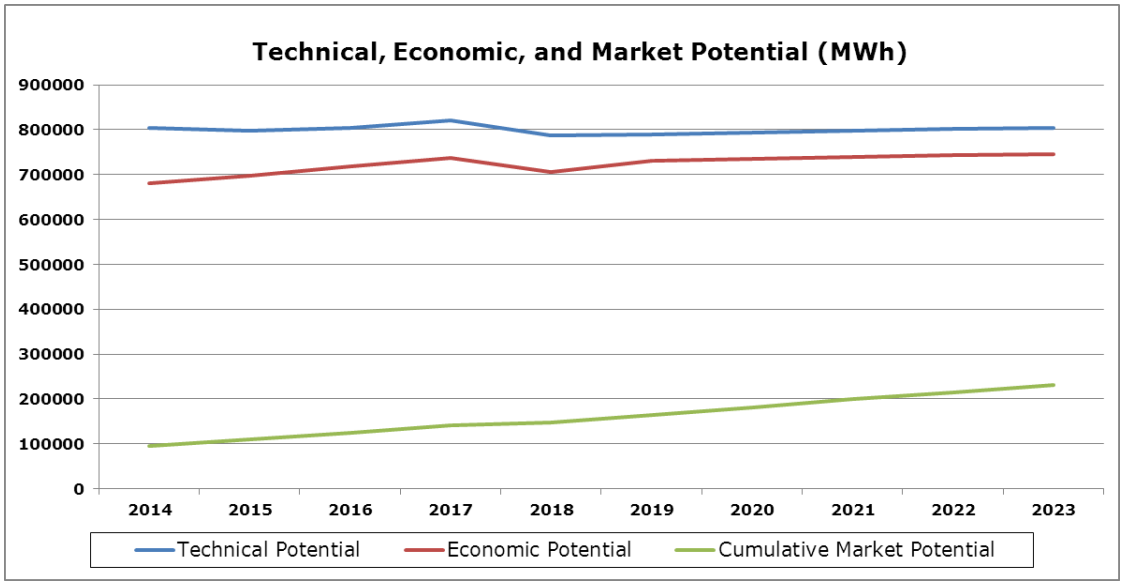
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	72	87	90	115	129	146	163	179	193	205
Commercial	164	146	127	114	100	95	92	90	92	88
Industrial	79	62	49	48	35	28	26	30	24	23
Total All Buildings	**315**	**295**	**266**	**276**	**263**	**269**	**281**	**299**	**309**	**315**
% of Forecast Sales	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**
Utility Re-Participation	45	11	17	59	46	16	22	30	112	82
Total All Buildings (includes Re-participation)	**360**	**306**	**283**	**335**	**309**	**285**	**303**	**329**	**422**	**397**
% of Sales with Re-Participation	**0.04%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.03%**	**0.04%**	**0.04%**
Codes & Standards	**429**	**322**	**396**	**401**	**428**	**427**	**424**	**377**	**280**	**220**
Incremental & Codes and Standard Effects as % of Forecast	**0.08%**	**0.06%**	**0.07%**	**0.07%**	**0.07%**	**0.07%**	**0.07%**	**0.07%**	**0.07%**	**0.06%**

MODESTO IRRGIATION DISTRICT



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**15,950**	**17,104**	**18,196**	**18,986**	**18,254**	**18,974**	**19,233**	**19,162**	**18,770**	**17,862**
Total Energy Use (GWh):	2,559.65	2,585.41	2,612.76	2,646.38	2,686.34	2,726.96	2,768.28	2,825.21	2,885.57	2,949.30
Residential Sector Energy Use (GWH):	927.60	944.54	962.51	983.31	1,004.09	1,025.87	1,047.54	1,073.45	1,100.79	1,129.43
Commercial Sector Energy Use (GWH):	760.64	767.44	775.41	785.00	796.15	808.75	822.23	844.70	868.51	893.52
Industrial Sector Energy Use (GWH):	770.91	771.78	772.02	774.08	780.93	785.98	790.95	798.29	806.29	815.15
Target as Percent of Total	***0.64%***	***0.68%***	***0.71%***	***0.75%***	***0.72%***	***0.80%***	***0.78%***	***0.79%***	***0.83%***	***0.78%***
Electric Demand										
Adopted Target (MW)	**3.64**	**4.05**	**4.46**	**4.84**	**5.03**	**5.45**	**5.76**	**5.96**	**6.02**	**5.87**
Total Demand (MW):	668.59	677.30	686.38	697.56	708.98	720.94	731.35	746.08	761.15	776.99
Residential Demand (MW):	242.29	247.44	252.86	259.19	265.00	271.21	276.75	283.48	290.36	297.55
Commercial Demand (MW):	198.68	201.05	203.70	206.92	210.12	213.81	217.22	223.07	229.09	235.40
Industrial Demand (MW):	201.36	202.18	202.81	204.04	206.10	207.79	208.96	210.81	212.68	214.75
Target as Percent of Total	***0.55%***	***0.61%***	***0.66%***	***0.71%***	***0.73%***	***0.82%***	***0.84%***	***0.87%***	***0.96%***	***0.92%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	310,656	297,982	297,223	300,895	281,155	283,612	289,621	294,973	300,477	306,147
Commercial	363,208	372,332	380,329	394,024	380,329	378,724	377,408	373,655	370,329	366,399
Industrial & Agriculture	129,321	127,612	125,795	125,280	125,531	126,506	127,471	128,730	130,097	131,605
Total All Buildings	**803,185**	**797,925**	**803,347**	**820,199**	**787,015**	**788,841**	**794,500**	**797,358**	**800,903**	**804,151**
% of Forecast Sales	31.38%	30.86%	30.75%	30.99%	29.30%	28.93%	28.70%	28.22%	27.76%	27.27%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	141,176	120,757	112,213	111,693	110,968	112,905	115,276	117,451	119,928	122,254
Commercial	81,693	82,450	83,756	86,569	83,998	83,869	83,806	83,069	82,437	81,653
Industrial & Agricultural	23,568	23,436	23,285	23,283	23,424	23,606	23,786	24,021	24,276	24,558
Total All Buildings	**246,437**	**226,642**	**219,255**	**221,546**	**218,390**	**220,380**	**222,868**	**224,541**	**226,641**	**228,465**
% of Forecast Sales	36.86%	33.46%	31.94%	31.76%	30.80%	30.57%	30.47%	30.10%	29.78%	29.40%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	222,930	232,166	247,423	254,297	232,672	256,127	261,303	266,433	271,267	276,198
Commercial	329,741	340,186	349,185	361,129	349,253	348,900	347,890	344,445	341,436	337,803
Industrial & Agriculture	127,580	125,868	122,034	122,520	123,767	125,747	126,707	128,644	130,010	131,517
Total All Buildings	**680,251**	**698,220**	**718,643**	**737,946**	**705,691**	**730,774**	**735,900**	**739,522**	**742,713**	**745,518**
% of Forecast Sales	26.58%	27.01%	27.51%	27.89%	26.27%	26.80%	26.58%	26.18%	25.74%	25.28%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	69,782	70,948	72,237	73,693	71,432	75,859	77,128	79,210	80,721	82,261
Commercial	69,417	70,864	72,867	75,433	73,278	73,387	73,433	72,806	72,283	71,605
Industrial & Agriculture	23,243	23,111	22,772	22,862	23,095	23,464	23,644	24,005	24,260	24,541
Total All Buildings	**162,442**	**164,923**	**167,876**	**171,988**	**167,804**	**172,711**	**174,205**	**176,021**	**177,265**	**178,407**
% of Forecast Sales	24.30%	24.35%	24.46%	24.66%	23.67%	23.96%	23.82%	23.59%	23.29%	22.96%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	15,201	19,722	26,245	32,610	34,355	41,232	49,831	58,768	67,519	75,782
Commercial	46,922	50,646	54,228	58,707	59,140	64,186	69,138	73,465	77,359	81,201
Industrial & Agriculture	33,774	39,118	44,216	49,349	54,099	58,513	62,731	66,947	70,530	73,877
Total All Buildings	**95,897**	**109,486**	**124,688**	**140,665**	**147,595**	**163,931**	**181,700**	**199,179**	**215,408**	**230,860**
% of Forecast Sales	3.75%	4.23%	4.77%	5.32%	5.49%	6.01%	6.56%	7.05%	7.46%	7.83%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,771	5,299	7,368	9,793	11,985	15,214	18,922	22,915	26,884	30,762
Commercial	9,571	10,307	11,082	12,037	12,147	13,194	14,218	15,127	15,957	16,753
Industrial & Agriculture	6,114	7,162	8,182	9,174	10,095	10,919	11,706	12,492	13,161	13,785
Total All Buildings	**19,456**	**22,768**	**26,633**	**31,004**	**34,227**	**39,326**	**44,846**	**50,534**	**56,002**	**61,300**
% of Forecast Sales	2.91%	3.36%	3.88%	4.44%	4.83%	5.45%	6.13%	6.77%	7.36%	7.89%

Incremental Market Potential

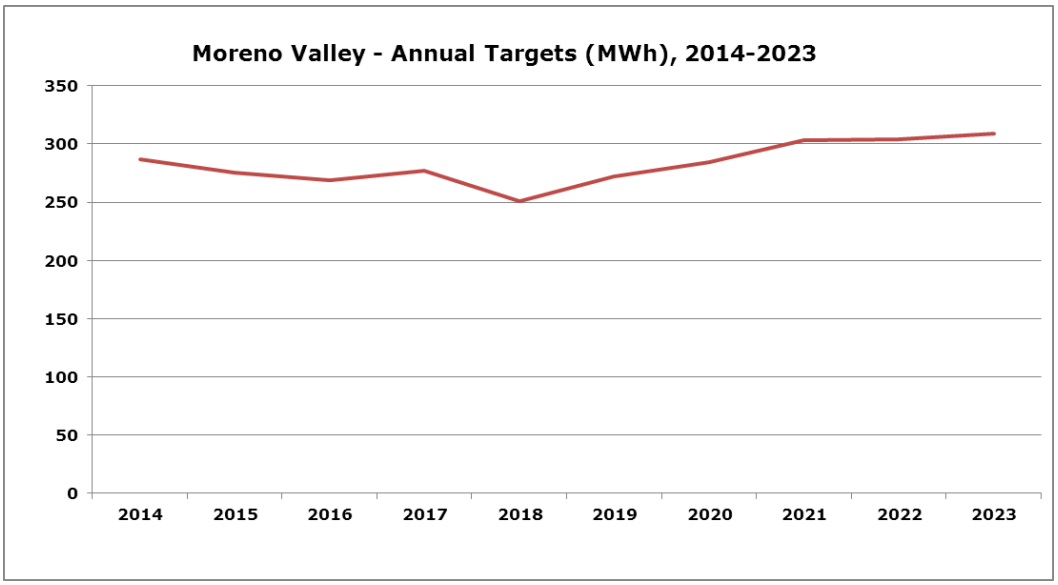
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,472	5,448	6,758	7,795	7,689	8,675	9,336	9,707	9,722	9,359
Commercial	5,497	5,576	5,557	5,563	5,254	5,219	5,121	4,970	4,766	4,434
Industrial & Agriculture	5,982	6,080	5,881	5,628	5,311	5,081	4,776	4,485	4,282	4,070
Total All Buildings	**15,950**	**17,104**	**18,196**	**18,986**	**18,254**	**18,974**	**19,233**	**19,162**	**18,770**	**17,862**
% of Forecast Sales	**0.62%**	**0.66%**	**0.70%**	**0.72%**	**0.68%**	**0.70%**	**0.69%**	**0.68%**	**0.65%**	**0.61%**
Utility Re-Participation	489	603	340	781	1,023	2,750	2,289	3,178	5,312	5,228
Total All Buildings (includes Re-participation)	**16,440**	**17,707**	**18,536**	**19,767**	**19,276**	**21,725**	**21,521**	**22,340**	**24,082**	**23,091**
% of Sales with Re-Participation	**0.64%**	**0.68%**	**0.71%**	**0.75%**	**0.72%**	**0.80%**	**0.78%**	**0.79%**	**0.83%**	**0.78%**
Codes & Standards	**5,295**	**7,379**	**8,658**	**8,898**	**12,302**	**12,519**	**12,498**	**12,191**	**11,077**	**9,812**
Incremental & Codes and Standard Effects as % of Forecast	**0.85%**	**0.97%**	**1.04%**	**1.08%**	**1.18%**	**1.26%**	**1.23%**	**1.22%**	**1.22%**	**1.12%**

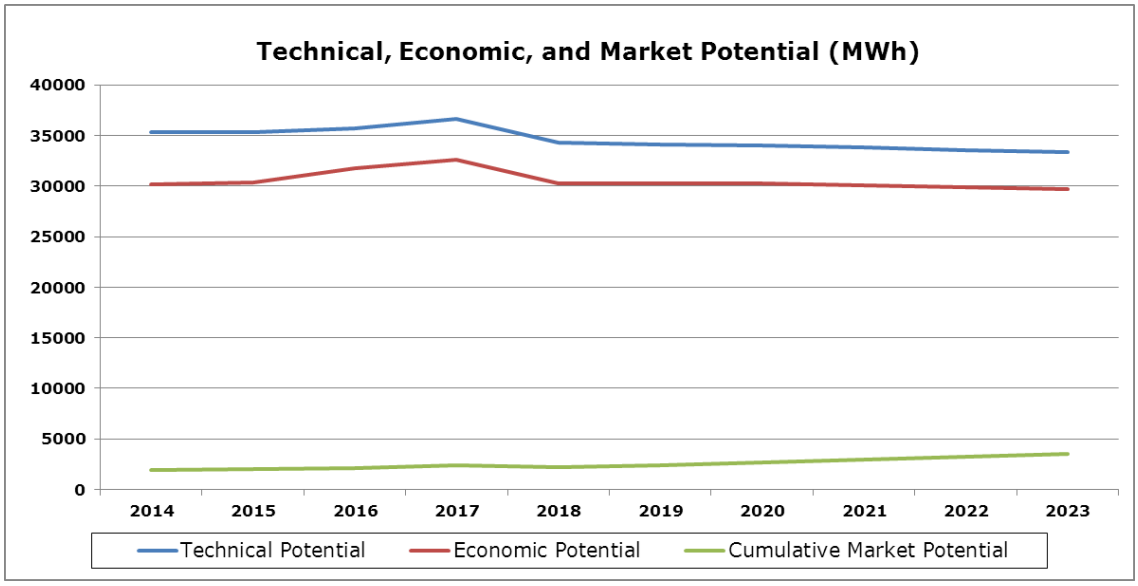
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,380	1,752	2,191	2,636	2,956	3,425	3,811	4,097	4,235	4,190
Commercial	1,169	1,178	1,168	1,158	1,087	1,074	1,053	1,024	985	916
Industrial & Agriculture	1,092	1,123	1,097	1,050	991	948	891	837	799	759
Total All Buildings	**3,641**	**4,053**	**4,457**	**4,844**	**5,034**	**5,447**	**5,755**	**5,958**	**6,018**	**5,866**
% of Forecast Sales	**0.54%**	**0.60%**	**0.65%**	**0.69%**	**0.71%**	**0.76%**	**0.79%**	**0.80%**	**0.79%**	**0.75%**
Utility Re-Participation	57	92	51	104	149	461	390	537	1,273	1,318
Total All Buildings (includes Re-participation)	**3,698**	**4,145**	**4,508**	**4,948**	**5,183**	**5,908**	**6,145**	**6,494**	**7,291**	**7,184**
% of Sales with Re-Participation	**0.55%**	**0.61%**	**0.66%**	**0.71%**	**0.73%**	**0.82%**	**0.84%**	**0.87%**	**0.96%**	**0.92%**
Codes & Standards	**3,543**	**4,893**	**5,913**	**6,160**	**6,716**	**6,849**	**6,963**	**6,473**	**5,278**	**4,539**
Incremental & Codes and Standard Effects as % of Forecast	**1.08%**	**1.33%**	**1.52%**	**1.59%**	**1.68%**	**1.77%**	**1.79%**	**1.74%**	**1.65%**	**1.51%**

MORENO VALLEY UTILITY



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**286**	**276**	**269**	**277**	**251**	**272**	**284**	**303**	**304**	**309**
Total Energy Use (GWh):	156.80	159.16	161.54	163.97	166.43	168.92	171.46	174.03	176.64	179.29
Residential Sector Energy Use (GWH):	38.78	39.36	39.95	40.55	41.16	41.77	42.40	43.04	43.68	44.34
Commercial Sector Energy Use (GWH):	104.44	106.00	107.59	109.21	110.85	112.51	114.20	115.91	117.65	119.41
Industrial Sector Energy Use (GWH):	13.59	13.79	14.00	14.21	14.42	14.64	14.86	15.08	15.31	15.54
Target as Percent of Total	***0.18%***	***0.17%***	***0.17%***	***0.17%***	***0.15%***	***0.16%***	***0.17%***	***0.17%***	***0.17%***	***0.17%***
Electric Demand										
Adopted Target (MW)	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.08**	**0.09**	**0.10**	**0.10**	**0.11**
Total Demand (MW):	43.97	44.63	45.30	45.98	46.67	47.37	48.08	48.80	49.53	50.28
Residential Demand (MW):	10.87	11.04	11.20	11.37	11.54	11.71	11.89	12.07	12.25	12.43
Commercial Demand (MW):	29.29	29.73	30.17	30.62	31.08	31.55	32.02	32.50	32.99	33.49
Industrial Demand (MW):	3.81	3.87	3.93	3.99	4.05	4.11	4.17	4.23	4.29	4.36
Target as Percent of Total	***0.17%***	***0.16%***	***0.15%***	***0.16%***	***0.16%***	***0.17%***	***0.18%***	***0.20%***	***0.21%***	***0.21%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	12,806	12,173	11,886	11,889	10,579	10,418	10,436	10,379	10,324	10,268
Commercial	20,372	21,004	21,667	22,602	21,562	21,433	21,329	21,130	20,937	20,746
Industrial & Agriculture	2,143	2,143	2,143	2,161	2,178	2,214	2,250	2,285	2,321	2,358
Total All Buildings	**35,321**	**35,320**	**35,697**	**36,652**	**34,319**	**34,065**	**34,016**	**33,795**	**33,582**	**33,372**
% of Forecast Sales	22.53%	22.19%	22.10%	22.35%	20.62%	20.17%	19.84%	19.42%	19.01%	18.61%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,521	4,776	4,266	4,250	4,148	4,176	4,196	4,185	4,173	4,165
Commercial	4,724	4,373	4,495	4,687	4,481	4,469	4,461	4,423	4,386	4,350
Industrial & Agricultural	390	394	397	402	406	413	420	426	433	440
Total All Buildings	**10,636**	**9,542**	**9,158**	**9,339**	**9,036**	**9,057**	**9,077**	**9,035**	**8,993**	**8,955**
% of Forecast Sales	24.19%	21.38%	20.22%	20.31%	19.36%	19.12%	18.88%	18.51%	18.15%	17.81%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	9,617	9,288	10,040	10,068	8,683	8,643	8,641	8,588	8,534	8,481
Commercial	18,419	18,958	19,614	20,424	19,470	19,456	19,373	19,195	19,022	18,851
Industrial & Agriculture	2,117	2,117	2,082	2,116	2,151	2,186	2,239	2,285	2,321	2,358
Total All Buildings	**30,153**	**30,362**	**31,735**	**32,608**	**30,304**	**30,285**	**30,253**	**30,068**	**29,877**	**29,689**
% of Forecast Sales	19.23%	19.08%	19.64%	19.89%	18.21%	17.93%	17.64%	17.28%	16.91%	16.56%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,708	2,295	1,781	1,778	1,645	1,641	1,633	1,627	1,619	1,613
Commercial	4,126	3,779	3,918	4,090	3,902	3,948	3,946	3,914	3,882	3,851
Industrial & Agriculture	385	389	388	395	401	408	418	426	433	440
Total All Buildings	**7,220**	**6,462**	**6,088**	**6,263**	**5,948**	**5,997**	**5,997**	**5,967**	**5,934**	**5,903**
% of Forecast Sales	16.42%	14.48%	13.44%	13.62%	12.75%	12.66%	12.47%	12.23%	11.98%	11.74%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	78	147	229	333	360	475	603	743	888	1,036
Commercial	1,672	1,729	1,774	1,868	1,647	1,769	1,894	2,011	2,134	2,254
Industrial & Agriculture	129	140	145	155	165	177	187	199	211	222
Total All Buildings	**1,880**	**2,017**	**2,149**	**2,356**	**2,172**	**2,420**	**2,684**	**2,953**	**3,232**	**3,512**
% of Forecast Sales	1.20%	1.27%	1.33%	1.44%	1.31%	1.43%	1.57%	1.70%	1.83%	1.96%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	26	53	79	118	152	202	260	323	390	459
Commercial	428	367	379	399	351	377	404	428	454	480
Industrial & Agriculture	22	24	26	29	31	33	35	37	39	41
Total All Buildings	**477**	**444**	**484**	**546**	**534**	**613**	**699**	**789**	**883**	**980**
% of Forecast Sales	1.08%	1.00%	1.07%	1.19%	1.14%	1.29%	1.45%	1.62%	1.78%	1.95%

Incremental Market Potential

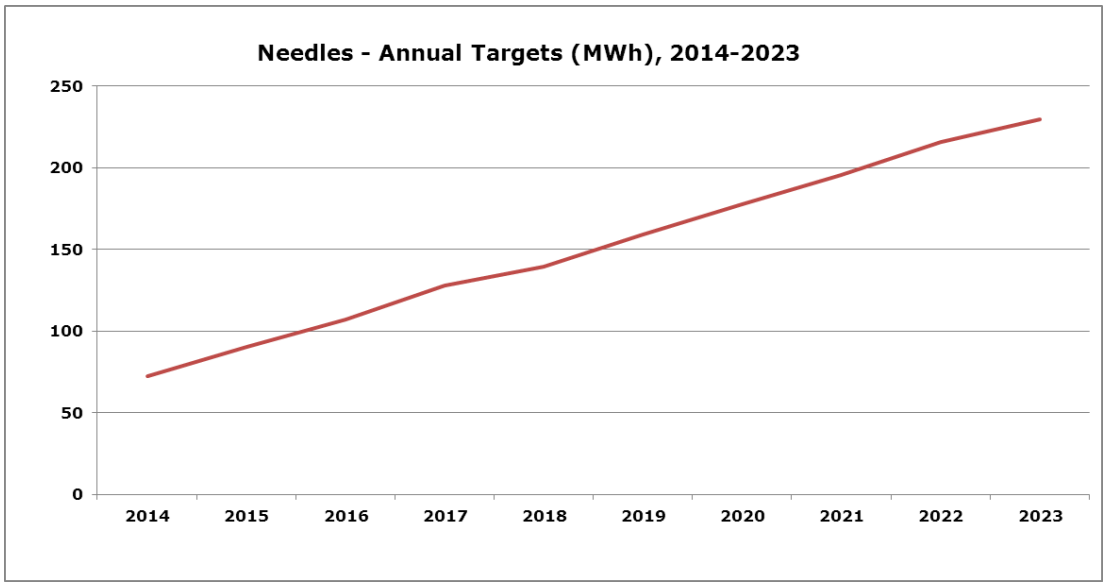
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	55	71	86	104	101	116	130	142	150	155
Commercial	204	179	162	154	130	130	130	130	128	125
Industrial & Agriculture	21	18	16	16	15	14	14	14	13	13
Total All Buildings	**280**	**268**	**264**	**273**	**246**	**260**	**274**	**285**	**292**	**293**
% of Forecast Sales	**0.18%**	**0.17%**	**0.16%**	**0.17%**	**0.15%**	**0.15%**	**0.16%**	**0.16%**	**0.17%**	**0.16%**
Utility Re-Participation	7	7	5	4	5	12	10	17	13	16
Total All Buildings (includes Re-participation)	**286**	**276**	**269**	**277**	**251**	**272**	**284**	**303**	**304**	**309**
% of Sales with Re-Participation	**0.18%**	**0.17%**	**0.17%**	**0.17%**	**0.15%**	**0.16%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**
Codes & Standards	**286**	**347**	**410**	**411**	**600**	**601**	**588**	**570**	**491**	**424**
Incremental & Codes and Standard Effects as % of Forecast	**0.36%**	**0.39%**	**0.42%**	**0.42%**	**0.51%**	**0.52%**	**0.51%**	**0.50%**	**0.45%**	**0.41%**

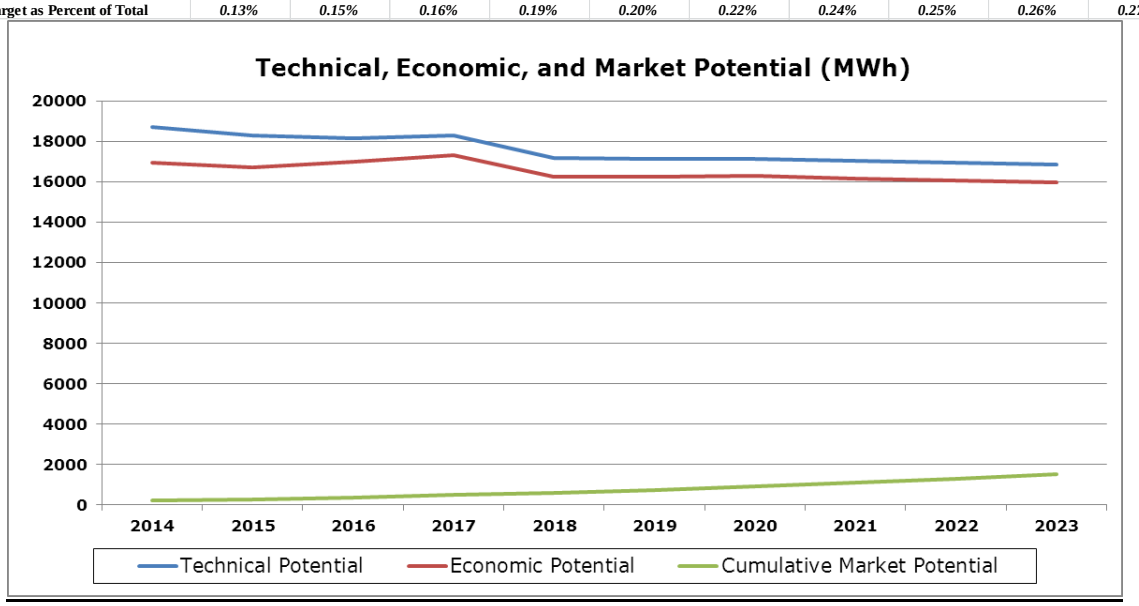
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	25	29	32	39	44	51	57	64	69	72
Commercial	44	38	34	32	27	27	27	27	27	26
Industrial & Agriculture	3	3	3	3	3	3	3	3	2	2
Total All Buildings	**72**	**70**	**69**	**74**	**73**	**80**	**87**	**93**	**98**	**101**
% of Forecast Sales	**0.16%**	**0.16%**	**0.15%**	**0.16%**	**0.16%**	**0.17%**	**0.18%**	**0.19%**	**0.20%**	**0.20%**
Utility Re-Participation	1	1	1	0	1	1	1	4	3	4
Total All Buildings (includes Re-participation)	**73**	**71**	**70**	**75**	**73**	**81**	**88**	**97**	**102**	**105**
% of Sales with Re-Participation	**0.17%**	**0.16%**	**0.15%**	**0.16%**	**0.16%**	**0.17%**	**0.18%**	**0.20%**	**0.21%**	**0.21%**
Codes & Standards	**285**	**153**	**204**	**206**	**230**	**228**	**226**	**212**	**177**	**158**
Incremental & Codes and Standard Effects as % of Forecast	**0.81%**	**0.50%**	**0.60%**	**0.61%**	**0.65%**	**0.65%**	**0.65%**	**0.63%**	**0.56%**	**0.52%**

CITY OF NEEDLES



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**72**	**90**	**107**	**128**	**139**	**159**	**177**	**195**	**215**	**229**
Total Energy Use (GWh):	67.98	70.87	73.89	77.03	80.30	83.72	87.28	90.99	94.86	98.89
Residential Sector Energy Use (GWH):	39.70	41.39	43.15	44.98	46.90	48.89	50.97	53.14	55.40	57.75
Commercial Sector Energy Use (GWH):	28.28	29.48	30.74	32.04	33.41	34.83	36.31	37.85	39.46	41.14
Industrial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.11%***	***0.13%***	***0.14%***	***0.17%***	***0.17%***	***0.19%***	***0.20%***	***0.21%***	***0.23%***	***0.23%***
Electric Demand										
Adopted Target (MW)	**0.03**	**0.04**	**0.04**	**0.05**	**0.05**	**0.06**	**0.07**	**0.07**	**0.08**	**0.09**
Total Demand (MW):	22.56	23.52	24.52	25.56	26.65	27.78	28.96	30.20	31.48	32.82
Residential Demand (MW):	13.18	13.74	14.32	14.93	15.56	16.23	16.92	17.63	18.38	19.17
Commercial Demand (MW):	9.39	9.78	10.20	10.63	11.09	11.56	12.05	12.56	13.10	13.65
Industrial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.13%***	***0.15%***	***0.16%***	***0.19%***	***0.20%***	***0.22%***	***0.24%***	***0.25%***	***0.26%***	***0.27%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	8,648	8,218	8,035	8,032	7,405	7,349	7,381	7,362	7,344	7,327
Commercial	10,069	10,075	10,093	10,268	9,780	9,767	9,763	9,674	9,596	9,501
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**18,717**	**18,293**	**18,128**	**18,299**	**17,185**	**17,116**	**17,145**	**17,036**	**16,940**	**16,828**
% of Forecast Sales	27.53%	25.81%	24.54%	23.76%	21.40%	20.45%	19.64%	18.72%	17.86%	17.02%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,651	3,191	2,940	2,903	2,853	2,866	2,877	2,872	2,865	2,861
Commercial	2,413	2,222	2,224	2,258	2,163	2,163	2,165	2,147	2,132	2,113
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**6,064**	**5,414**	**5,164**	**5,161**	**5,016**	**5,029**	**5,042**	**5,018**	**4,997**	**4,974**
% of Forecast Sales	26.88%	23.02%	21.06%	20.19%	18.82%	18.10%	17.41%	16.62%	15.88%	15.16%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,541	7,353	7,584	7,776	7,119	7,134	7,166	7,147	7,129	7,111
Commercial	9,393	9,357	9,389	9,516	9,105	9,100	9,103	9,020	8,950	8,861
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**16,934**	**16,710**	**16,973**	**17,293**	**16,224**	**16,234**	**16,269**	**16,167**	**16,078**	**15,972**
% of Forecast Sales	24.91%	23.58%	22.97%	22.45%	20.20%	19.39%	18.64%	17.77%	16.95%	16.15%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,967	2,777	2,500	2,600	2,547	2,560	2,570	2,565	2,559	2,554
Commercial	2,097	1,908	1,916	1,945	1,867	1,869	1,874	1,859	1,848	1,831
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**5,063**	**4,685**	**4,417**	**4,545**	**4,414**	**4,429**	**4,444**	**4,424**	**4,407**	**4,386**
% of Forecast Sales	22.44%	19.92%	18.01%	17.78%	16.56%	15.94%	15.34%	14.65%	14.00%	13.36%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	133	164	218	300	364	464	576	698	827	962
Commercial	58	90	127	172	212	267	326	390	459	531
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**191**	**254**	**345**	**471**	**576**	**731**	**902**	**1,088**	**1,286**	**1,493**
% of Forecast Sales	0.28%	0.36%	0.47%	0.61%	0.72%	0.87%	1.03%	1.20%	1.36%	1.51%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	96	91	114	154	196	248	305	366	431	497
Commercial	10	15	22	29	36	46	56	67	79	91
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**105**	**106**	**135**	**183**	**233**	**293**	**361**	**433**	**509**	**589**
% of Forecast Sales	0.47%	0.45%	0.55%	0.72%	0.87%	1.06%	1.24%	1.43%	1.62%	1.79%

Incremental Market Potential

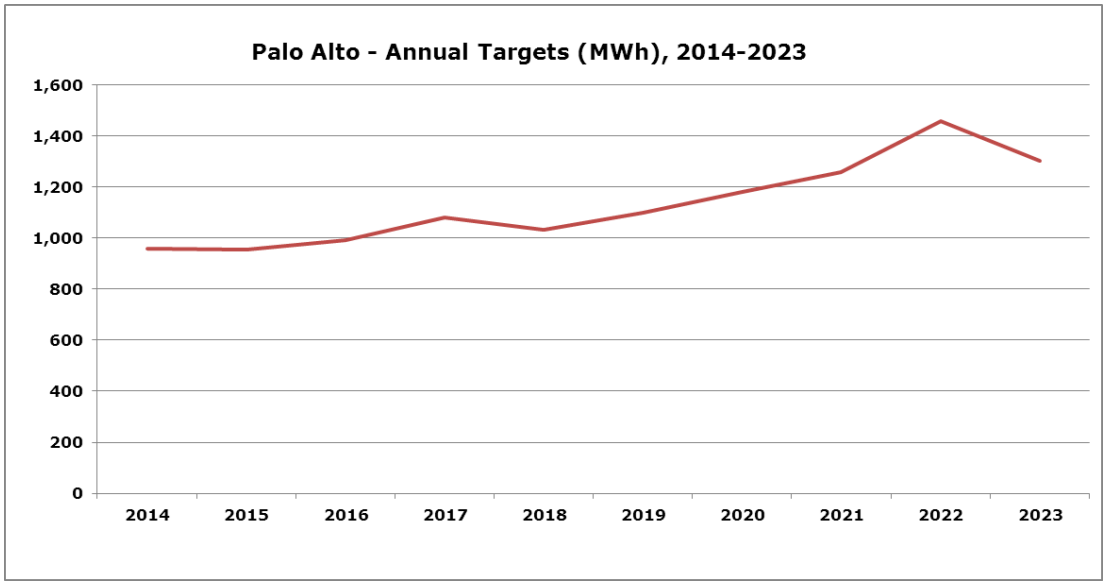
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	46	57	67	82	88	101	113	123	133	140
Commercial	26	32	39	45	50	55	61	66	70	74
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**71**	**90**	**107**	**127**	**138**	**156**	**173**	**189**	**203**	**214**
% of Forecast Sales	**0.11%**	**0.13%**	**0.14%**	**0.17%**	**0.17%**	**0.19%**	**0.20%**	**0.21%**	**0.21%**	**0.22%**
Utility Re-Participation	1	0	0	1	1	3	4	6	12	15
Total All Buildings (includes Re-participation)	**72**	**90**	**107**	**128**	**139**	**159**	**177**	**195**	**215**	**229**
% of Sales with Re-Participation	**0.11%**	**0.13%**	**0.14%**	**0.17%**	**0.17%**	**0.19%**	**0.20%**	**0.21%**	**0.23%**	**0.23%**
Codes & Standards	**156**	**204**	**245**	**249**	**344**	**346**	**341**	**331**	**295**	**263**
Incremental & Codes and Standard Effects as % of Forecast	**0.34%**	**0.42%**	**0.48%**	**0.49%**	**0.60%**	**0.60%**	**0.59%**	**0.58%**	**0.54%**	**0.50%**

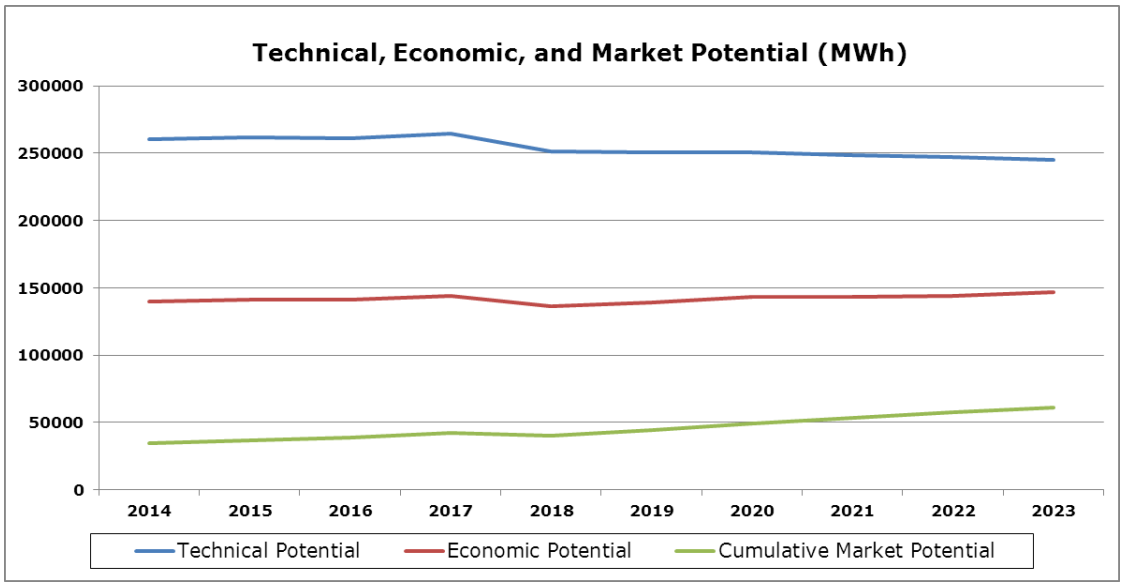
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	25	30	33	40	45	51	57	62	66	69
Commercial	4	6	7	8	9	10	10	11	12	13
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**29**	**35**	**40**	**48**	**54**	**61**	**68**	**73**	**78**	**82**
% of Forecast Sales	**0.13%**	**0.15%**	**0.16%**	**0.19%**	**0.20%**	**0.22%**	**0.23%**	**0.24%**	**0.25%**	**0.25%**
Utility Re-Participation	1	0	0	0	0	0	1	1	4	5
Total All Buildings (includes Re-participation)	**30**	**35**	**40**	**48**	**54**	**61**	**68**	**75**	**83**	**87**
% of Sales with Re-Participation	**0.13%**	**0.15%**	**0.16%**	**0.19%**	**0.20%**	**0.22%**	**0.24%**	**0.25%**	**0.26%**	**0.27%**
Codes & Standards	**148**	**108**	**133**	**137**	**149**	**149**	**149**	**138**	**112**	**99**
Incremental & Codes and Standard Effects as % of Forecast	**0.79%**	**0.61%**	**0.71%**	**0.72%**	**0.76%**	**0.76%**	**0.75%**	**0.70%**	**0.62%**	**0.57%**

CITY OF PALO ALTO UTILITIES



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**6,078**	**6,257**	**6,248**	**6,245**	**6,248**	**6,260**	**6,809**	**6,846**	**7,412**	**7,452**
Total Energy Use (GWh):	1,013.01	1,042.82	1,041.32	1,040.78	1,041.33	1,043.38	1,047.53	1,053.20	1,058.89	1,064.61
Residential Sector Energy Use (GWH):	206.81	212.90	212.60	212.48	212.60	213.02	213.86	215.02	216.18	217.35
Commercial Sector Energy Use (GWH):	529.41	544.99	544.21	543.93	544.21	545.28	547.45	550.41	553.39	556.38
Industrial Sector Energy Use (GWH):	276.78	284.93	284.52	284.37	284.52	285.08	286.22	287.76	289.32	290.88
Target as Percent of Total	***0.60%***	***0.60%***	***0.60%***	***0.60%***	***0.60%***	***0.60%***	***0.65%***	***0.65%***	***0.70%***	***0.70%***
Electric Demand										
Adopted Target (MW)	**0.96**	**0.95**	**0.99**	**1.08**	**1.03**	**1.10**	**1.18**	**1.26**	**1.46**	**1.30**
Total Demand (MW):	196.00	198.00	197.00	197.00	196.00	195.00	195.00	194.00	193.01	192.02
Residential Demand (MW):	40.02	40.42	40.22	40.22	40.02	39.81	39.81	39.61	39.40	39.20
Commercial Demand (MW):	102.43	103.48	102.95	102.95	102.43	101.91	101.91	101.39	100.87	100.35
Industrial Demand (MW):	53.55	54.10	53.83	53.83	53.55	53.28	53.28	53.01	52.73	52.46
Target as Percent of Total	***0.49%***	***0.48%***	***0.50%***	***0.55%***	***0.53%***	***0.56%***	***0.61%***	***0.65%***	***0.76%***	***0.68%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	47,639	47,086	46,278	46,127	40,797	39,872	39,671	39,544	39,283	38,973
Commercial	177,101	179,228	180,793	184,841	177,983	177,719	177,556	175,857	174,357	172,474
Industrial & Agriculture	35,304	35,154	33,916	33,334	32,787	32,911	33,101	33,308	33,516	33,725
Total All Buildings	**260,044**	**261,468**	**260,986**	**264,301**	**251,567**	**250,503**	**250,329**	**248,709**	**247,156**	**245,172**
% of Forecast Sales	25.67%	25.07%	25.06%	25.39%	24.16%	24.01%	23.90%	23.61%	23.34%	23.03%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	17,336	17,241	16,012	15,980	15,388	15,285	15,283	15,227	15,193	15,139
Commercial	162,169	174,163	186,029	185,358	182,516	181,078	179,680	177,893	176,175	174,363
Industrial & Agricultural	6,248	6,327	6,212	6,162	6,118	6,141	6,177	6,215	6,254	6,293
Total All Buildings	**185,753**	**197,730**	**208,253**	**207,500**	**204,022**	**202,504**	**201,140**	**199,336**	**197,622**	**195,795**
% of Forecast Sales	94.77%	99.86%	105.71%	105.33%	104.09%	103.85%	103.15%	102.75%	102.39%	101.97%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	33,155	32,518	32,558	32,679	27,913	27,510	30,629	30,508	30,983	30,689
Commercial	79,509	80,763	80,494	83,157	80,632	83,356	84,363	84,183	83,959	86,984
Industrial & Agriculture	27,076	27,932	27,951	27,996	28,070	28,184	28,356	28,537	28,719	28,902
Total All Buildings	**139,740**	**141,214**	**141,004**	**143,832**	**136,614**	**139,050**	**143,349**	**143,228**	**143,661**	**146,575**
% of Forecast Sales	13.79%	13.54%	13.54%	13.82%	13.12%	13.33%	13.68%	13.60%	13.57%	13.77%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,701	7,609	7,599	7,601	7,048	7,020	7,526	7,499	7,459	7,421
Commercial	17,776	17,916	17,843	18,547	17,924	18,254	18,578	18,491	18,496	19,093
Industrial & Agriculture	5,052	5,212	5,216	5,224	5,238	5,259	5,291	5,325	5,359	5,393
Total All Buildings	**30,529**	**30,737**	**30,658**	**31,373**	**30,210**	**30,533**	**31,396**	**31,315**	**31,314**	**31,907**
% of Forecast Sales	15.58%	15.52%	15.56%	15.93%	15.41%	15.66%	16.10%	16.14%	16.22%	16.62%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6,877	7,314	7,916	8,628	7,542	8,522	9,771	11,101	12,412	13,623
Commercial	20,719	22,097	23,382	25,402	24,233	26,792	29,325	31,765	33,952	35,994
Industrial & Agriculture	7,133	7,318	7,506	7,962	8,391	9,120	9,754	10,334	10,869	11,370
Total All Buildings	**34,729**	**36,729**	**38,804**	**41,992**	**40,167**	**44,434**	**48,850**	**53,200**	**57,233**	**60,987**
% of Forecast Sales	3.43%	3.52%	3.73%	4.03%	3.86%	4.26%	4.66%	5.05%	5.40%	5.73%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,063	1,171	1,318	1,521	1,564	1,880	2,247	2,647	3,048	3,434
Commercial	4,058	4,227	4,480	4,907	4,614	5,163	5,712	6,238	6,703	7,147
Industrial & Agriculture	1,132	1,233	1,334	1,453	1,566	1,702	1,820	1,928	2,028	2,122
Total All Buildings	**6,253**	**6,632**	**7,132**	**7,881**	**7,744**	**8,744**	**9,778**	**10,813**	**11,779**	**12,703**
% of Forecast Sales	3.19%	3.35%	3.62%	4.00%	3.95%	4.48%	5.01%	5.57%	6.10%	6.62%

Incremental Market Potential

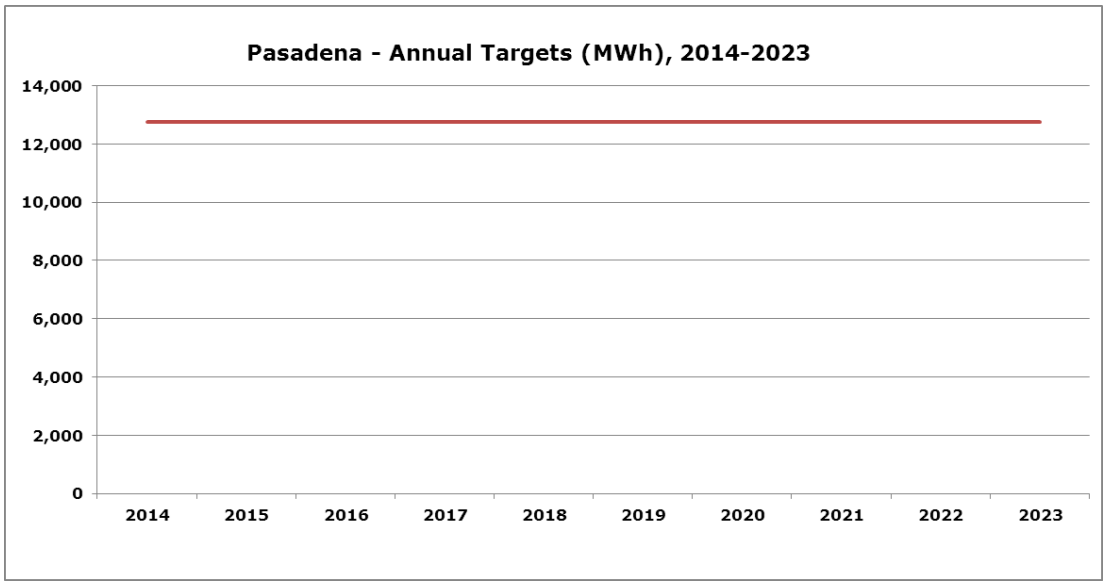
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,002	2,004	2,105	2,241	2,230	2,406	2,600	2,706	2,723	2,641
Commercial	2,587	2,517	2,502	2,614	2,535	2,571	2,551	2,520	2,388	2,180
Industrial & Agriculture	881	897	926	892	835	781	735	693	654	618
Total All Buildings	**5,470**	**5,418**	**5,532**	**5,747**	**5,599**	**5,758**	**5,886**	**5,918**	**5,765**	**5,439**
% of Forecast Sales	**0.54%**	**0.52%**	**0.53%**	**0.55%**	**0.54%**	**0.55%**	**0.56%**	**0.56%**	**0.54%**	**0.51%**
Utility Re-Participation	439	405	429	756	454	603	730	1,200	1,840	1,887
Total All Buildings (includes Re-participation)	**5,909**	**5,823**	**5,961**	**6,503**	**6,053**	**6,361**	**6,615**	**7,118**	**7,605**	**7,327**
% of Sales with Re-Participation	**0.58%**	**0.56%**	**0.57%**	**0.62%**	**0.58%**	**0.61%**	**0.63%**	**0.68%**	**0.72%**	**0.69%**
Codes & Standards	**1,048**	**1,536**	**1,999**	**2,088**	**2,924**	**2,766**	**2,565**	**2,399**	**2,039**	**1,764**
Incremental & Codes and Standard Effects as % of Forecast	**0.69%**	**0.71%**	**0.76%**	**0.83%**	**0.86%**	**0.87%**	**0.88%**	**0.90%**	**0.91%**	**0.85%**

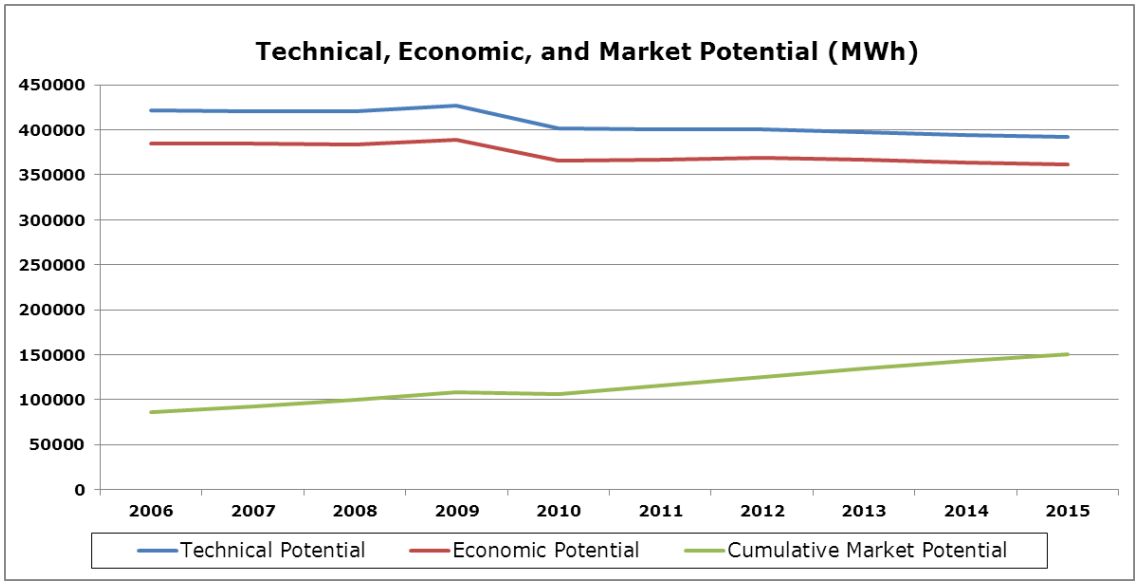
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	177	186	216	258	288	339	392	426	440	427
Commercial	565	553	545	570	537	551	553	540	516	471
Industrial & Agriculture	164	167	173	167	156	146	137	129	122	115
Total All Buildings	**906**	**906**	**934**	**994**	**981**	**1,035**	**1,082**	**1,096**	**1,077**	**1,013**
% of Forecast Sales	**0.46%**	**0.46%**	**0.47%**	**0.50%**	**0.50%**	**0.53%**	**0.55%**	**0.56%**	**0.56%**	**0.53%**
Utility Re-Participation	53	47	57	87	53	65	99	163	382	289
Total All Buildings (includes Re-participation)	**958**	**954**	**992**	**1,081**	**1,034**	**1,100**	**1,181**	**1,258**	**1,459**	**1,302**
% of Sales with Re-Participation	**0.49%**	**0.48%**	**0.50%**	**0.55%**	**0.53%**	**0.56%**	**0.61%**	**0.65%**	**0.76%**	**0.68%**
Codes & Standards	**331**	**406**	**594**	**621**	**753**	**716**	**673**	**648**	**569**	**524**
Incremental & Codes and Standard Effects as % of Forecast	**0.66%**	**0.69%**	**0.80%**	**0.86%**	**0.91%**	**0.93%**	**0.95%**	**0.98%**	**1.05%**	**0.95%**

PASADENA WATER & POWER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**12,750**	**12,750**	**12,750**	**12,750**	**12,750**	**12,750**	**12,750**	**12,750**	**12,750**	**12,750**
Total Energy Use (GWh):	1,225.00	1,255.96	1,265.38	1,271.70	1,278.06	1,284.45	1,290.88	1,297.33	1,303.82	1,310.34
Residential Sector Energy Use (GWH):	335.00	336.01	337.01	338.02	339.02	340.03	341.03	342.04	343.04	344.05
Commercial Sector Energy Use (GWH):	890.00	919.95	928.37	933.69	939.04	944.43	949.85	955.30	960.78	966.29
Industrial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***1.04%***	***1.02%***	***1.01%***	***1.00%***	***1.00%***	***0.99%***	***0.99%***	***0.98%***	***0.98%***	***0.97%***
Electric Demand										
Adopted Target (MW)	**2.30**	**2.30**	**2.30**	**2.30**	**2.30**	**2.30**	**2.30**	**2.30**	**2.30**	**2.30**
Total Demand (MW):	315.45	318.61	321.00	322.60	324.22	325.84	327.47	329.10	330.75	332.40
Residential Demand (MW):	86.27	85.24	85.49	85.75	86.00	86.26	86.51	86.77	87.02	87.28
Commercial Demand (MW):	229.19	233.37	235.51	236.86	238.21	239.58	240.96	242.34	243.73	245.13
Industrial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	114,714	110,173	108,478	108,734	96,568	95,382	95,522	95,028	94,524	94,028
Commercial	307,161	310,015	312,138	318,481	305,647	304,922	305,058	302,557	300,182	297,862
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**421,875**	**420,189**	**420,616**	**427,215**	**402,214**	**400,305**	**400,580**	**397,585**	**394,706**	**391,890**
% of Forecast Sales	34.44%	33.46%	33.24%	33.59%	31.47%	31.17%	31.03%	30.65%	30.27%	29.91%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	37,645	32,746	29,664	29,587	28,262	28,372	28,422	28,347	28,272	28,192
Commercial	71,442	71,111	71,521	72,900	70,406	70,427	70,685	70,220	69,790	69,371
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**109,088**	**103,857**	**101,186**	**102,486**	**98,668**	**98,799**	**99,107**	**98,567**	**98,062**	**97,563**
% of Forecast Sales	34.58%	32.60%	31.52%	31.77%	30.43%	30.32%	30.26%	29.95%	29.65%	29.35%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	99,667	96,229	94,275	94,613	81,458	81,341	83,463	82,984	82,497	82,011
Commercial	285,441	288,406	289,738	294,755	284,091	285,518	285,858	283,559	281,384	279,262
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**385,108**	**384,636**	**384,013**	**389,368**	**365,550**	**366,859**	**369,321**	**366,543**	**363,881**	**361,274**
% of Forecast Sales	31.44%	30.62%	30.35%	30.62%	28.60%	28.56%	28.61%	28.25%	27.91%	27.57%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	21,836	19,182	16,303	16,276	14,817	14,797	14,721	14,670	14,605	14,541
Commercial	61,165	61,065	61,551	62,727	60,749	61,825	62,173	61,798	61,457	61,126
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**83,001**	**80,247**	**77,855**	**79,003**	**75,566**	**76,622**	**76,894**	**76,468**	**76,062**	**75,667**
% of Forecast Sales	26.31%	25.19%	24.25%	24.49%	23.31%	23.52%	23.48%	23.24%	23.00%	22.76%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	20,642	21,353	23,712	26,763	23,449	26,052	29,745	33,488	36,927	39,818
Commercial	65,370	70,864	75,599	81,637	82,933	89,298	95,490	101,009	105,918	110,183
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**86,012**	**92,217**	**99,311**	**108,400**	**106,382**	**115,351**	**125,235**	**134,497**	**142,845**	**150,001**
% of Forecast Sales	7.02%	7.34%	7.85%	8.52%	8.32%	8.98%	9.70%	10.37%	10.96%	11.45%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,752	2,661	3,043	3,667	3,761	4,695	5,731	6,801	7,787	8,619
Commercial	15,848	16,868	17,837	19,037	19,213	20,506	21,751	22,868	23,867	24,759
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**18,601**	**19,530**	**20,880**	**22,703**	**22,974**	**25,201**	**27,481**	**29,670**	**31,654**	**33,378**
% of Forecast Sales	5.90%	6.13%	6.50%	7.04%	7.09%	7.73%	8.39%	9.02%	9.57%	10.04%

Incremental Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,198	4,526	4,888	5,748	6,278	6,686	6,995	7,085	6,884	6,403
Commercial	8,721	8,173	7,724	7,480	6,835	6,637	6,358	5,932	5,296	4,567
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**12,919**	**12,699**	**12,612**	**13,228**	**13,114**	**13,323**	**13,353**	**13,017**	**12,179**	**10,970**
% of Forecast Sales	**1.05%**	**1.01%**	**1.00%**	**1.04%**	**1.03%**	**1.04%**	**1.03%**	**1.00%**	**0.93%**	**0.84%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**12,919**	**12,699**	**12,612**	**13,228**	**13,114**	**13,323**	**13,353**	**13,017**	**12,179**	**10,970**
% of Sales with Re-Participation	**1.05%**	**1.01%**	**1.00%**	**1.04%**	**1.03%**	**1.04%**	**1.03%**	**1.00%**	**0.93%**	**0.84%**
Codes & Standards	**2,739**	**3,813**	**4,596**	**4,685**	**6,452**	**6,429**	**6,298**	**6,101**	**5,345**	**4,707**
Incremental & Codes and Standard Effects as % of Forecast	**1.28%**	**1.31%**	**1.36%**	**1.41%**	**1.53%**	**1.54%**	**1.52%**	**1.47%**	**1.34%**	**1.20%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	462	540	615	752	845	988	1,095	1,130	1,071	925
Commercial	1,920	1,739	1,584	1,488	1,339	1,307	1,266	1,191	1,077	945
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**2,381**	**2,278**	**2,199**	**2,240**	**2,184**	**2,295**	**2,361**	**2,321**	**2,148**	**1,871**
% of Forecast Sales	**0.75%**	**0.72%**	**0.68%**	**0.69%**	**0.67%**	**0.70%**	**0.72%**	**0.71%**	**0.65%**	**0.56%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**2,381**	**2,278**	**2,199**	**2,240**	**2,184**	**2,295**	**2,361**	**2,321**	**2,148**	**1,871**
% of Sales with Re-Participation	**0.75%**	**0.72%**	**0.68%**	**0.69%**	**0.67%**	**0.70%**	**0.72%**	**0.71%**	**0.65%**	**0.56%**
Codes & Standards	**1,339**	**1,513**	**1,902**	**1,937**	**2,199**	**2,177**	**2,154**	**1,989**	**1,609**	**1,349**
Incremental & Codes and Standard Effects as % of Forecast	**1.18%**	**1.19%**	**1.28%**	**1.29%**	**1.35%**	**1.37%**	**1.38%**	**1.31%**	**1.14%**	**0.97%**

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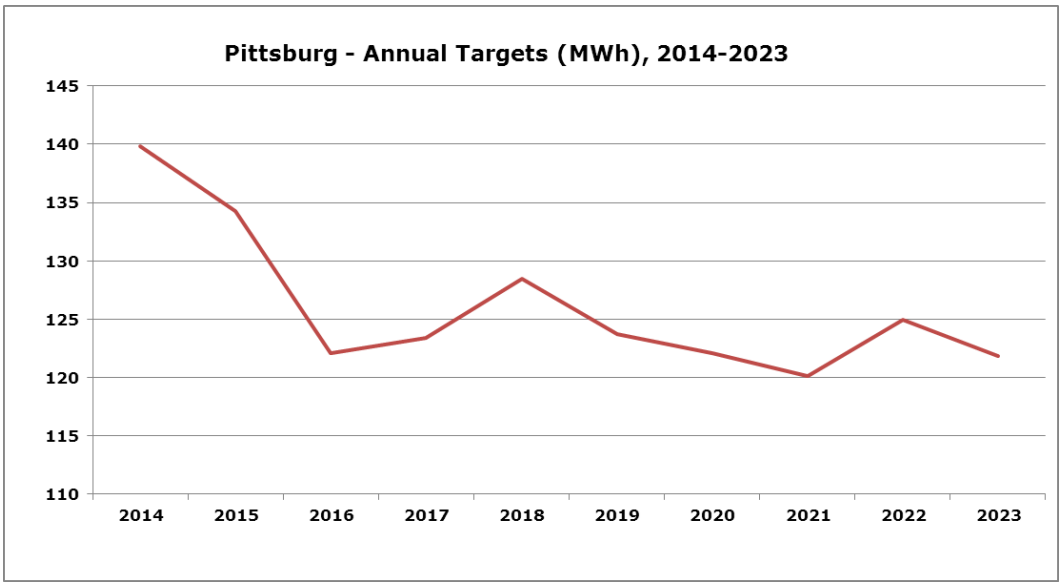
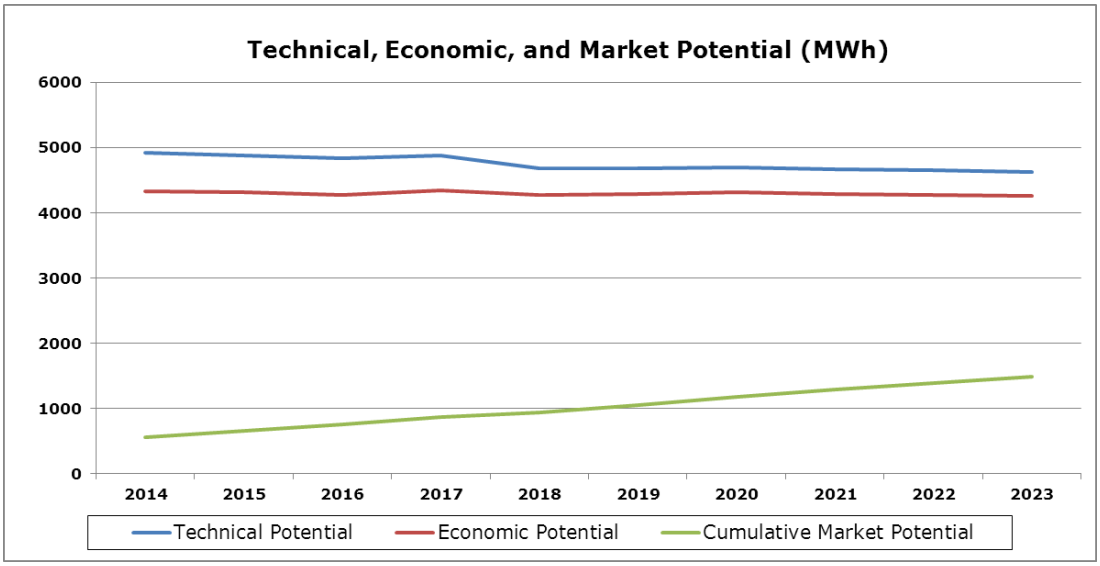


Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**140**	**134**	**122**	**123**	**128**	**124**	**122**	**120**	**125**	**122**
Total Energy Use (GWh):	17.95	18.28	18.61	18.95	19.30	19.66	20.02	20.38	20.76	21.14
Residential Sector Energy Use (GWH):	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61
Commercial Sector Energy Use (GWH):	13.08	13.34	13.61	13.88	14.16	14.44	14.73	15.02	15.32	15.63
Industrial Sector Energy Use (GWH):	3.27	3.33	3.40	3.47	3.54	3.61	3.68	3.76	3.83	3.91
Target as Percent of Total	***0.78%***	***0.73%***	***0.66%***	***0.65%***	***0.67%***	***0.63%***	***0.61%***	***0.59%***	***0.60%***	***0.58%***
Electric Demand										
Adopted Target (MW)	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**
Total Demand (MW):	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Residential Demand (MW):	0.39	0.38	0.37	0.36	0.36	0.35	0.34	0.33	0.32	0.31
Commercial Demand (MW):	3.29	3.30	3.30	3.31	3.32	3.33	3.34	3.35	3.35	3.36
Industrial Demand (MW):	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.84
Target as Percent of Total	***0.76%***	***0.67%***	***0.65%***	***0.65%***	***0.70%***	***0.65%***	***0.65%***	***0.64%***	***0.65%***	***0.61%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	714	686	666	667	588	575	575	570	566	562
Commercial	3,729	3,717	3,698	3,720	3,599	3,598	3,609	3,578	3,552	3,520
Industrial & Agriculture	471	474	477	484	490	501	512	522	533	544
Total All Buildings	**4,914**	**4,876**	**4,841**	**4,871**	**4,677**	**4,675**	**4,695**	**4,671**	**4,651**	**4,626**
% of Forecast Sales	27.37%	26.68%	26.01%	25.70%	24.23%	23.78%	23.46%	22.91%	22.41%	21.88%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	252	215	182	183	175	174	175	174	174	173
Commercial	1,093	1,074	1,070	1,075	1,050	1,052	1,058	1,051	1,046	1,038
Industrial & Agricultural	86	87	88	90	92	93	96	97	100	102
Total All Buildings	**1,431**	**1,376**	**1,340**	**1,348**	**1,316**	**1,320**	**1,329**	**1,323**	**1,319**	**1,313**
% of Forecast Sales	31.80%	30.58%	29.78%	29.95%	29.25%	29.33%	29.53%	29.40%	29.31%	29.17%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	329	316	294	359	360	360	363	363	363	362
Commercial	3,540	3,532	3,511	3,517	3,423	3,424	3,437	3,408	3,384	3,353
Industrial & Agriculture	462	466	462	472	482	496	507	518	531	542
Total All Buildings	**4,332**	**4,313**	**4,267**	**4,348**	**4,265**	**4,280**	**4,307**	**4,289**	**4,278**	**4,258**
% of Forecast Sales	24.13%	23.59%	22.92%	22.94%	22.10%	21.78%	21.52%	21.04%	20.60%	20.14%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	100	77	32	36	52	52	52	52	52	52
Commercial	934	918	916	918	901	904	912	907	903	896
Industrial & Agriculture	84	86	86	88	90	93	95	97	99	101
Total All Buildings	**1,118**	**1,080**	**1,034**	**1,042**	**1,043**	**1,049**	**1,059**	**1,055**	**1,054**	**1,050**
% of Forecast Sales	24.85%	24.00%	22.97%	23.15%	23.17%	23.32%	23.53%	23.45%	23.41%	23.32%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	14	19	24	32	29	37	49	62	77	92
Commercial	469	545	621	704	761	846	930	1,010	1,083	1,148
Industrial & Agriculture	68	90	111	132	152	172	191	209	224	238
Total All Buildings	**551**	**653**	**756**	**869**	**941**	**1,054**	**1,169**	**1,281**	**1,384**	**1,479**
% of Forecast Sales	3.07%	3.57%	4.06%	4.58%	4.88%	5.36%	5.84%	6.28%	6.67%	6.99%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2	3	3	4	4	6	8	10	13	16
Commercial	121	141	162	184	200	222	244	266	285	303
Industrial & Agriculture	12	16	21	25	28	32	36	39	42	44
Total All Buildings	**136**	**161**	**186**	**213**	**233**	**260**	**288**	**315**	**340**	**363**
% of Forecast Sales	3.01%	3.58%	4.13%	4.73%	5.17%	5.79%	6.40%	7.00%	7.56%	8.07%

Incremental Market Potential

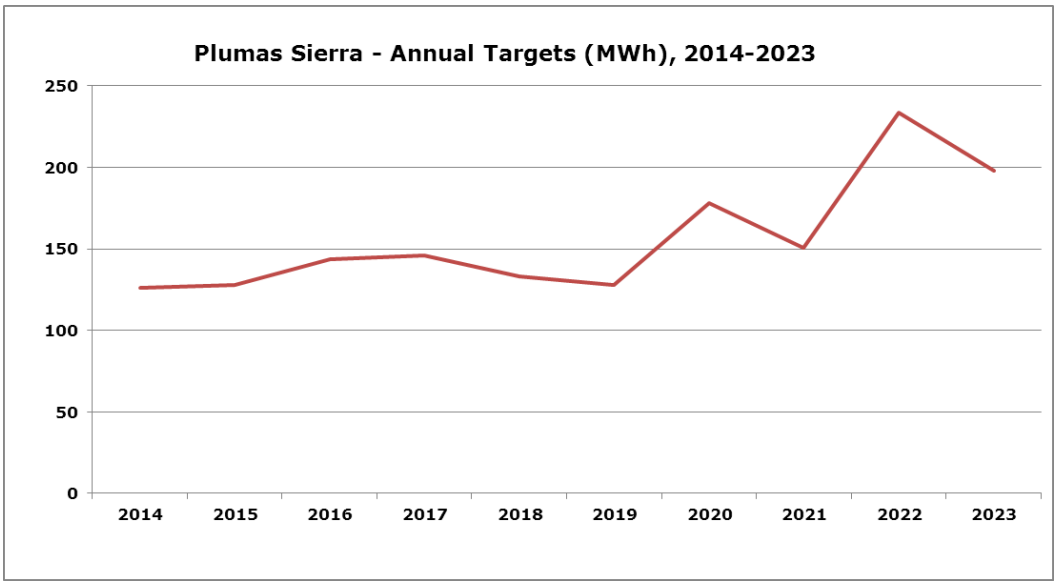
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4	5	6	8	8	10	12	14	15	15
Commercial	87	89	90	91	88	87	85	81	76	68
Industrial & Agriculture	23	23	23	22	21	20	19	18	18	17
Total All Buildings	**114**	**117**	**119**	**122**	**117**	**117**	**116**	**114**	**109**	**101**
% of Forecast Sales	**0.64%**	**0.64%**	**0.64%**	**0.64%**	**0.61%**	**0.60%**	**0.58%**	**0.56%**	**0.52%**	**0.48%**
Utility Re-Participation	25	17	3	2	11	7	6	6	16	21
Total All Buildings (includes Re-participation)	**140**	**134**	**122**	**123**	**128**	**124**	**122**	**120**	**125**	**122**
% of Sales with Re-Participation	**0.78%**	**0.73%**	**0.66%**	**0.65%**	**0.67%**	**0.63%**	**0.61%**	**0.59%**	**0.60%**	**0.58%**
Codes & Standards	**18**	**26**	**34**	**35**	**48**	**48**	**47**	**46**	**42**	**38**
Incremental & Codes and Standard Effects as % of Forecast	**0.88%**	**0.88%**	**0.84%**	**0.84%**	**0.91%**	**0.87%**	**0.84%**	**0.81%**	**0.80%**	**0.76%**

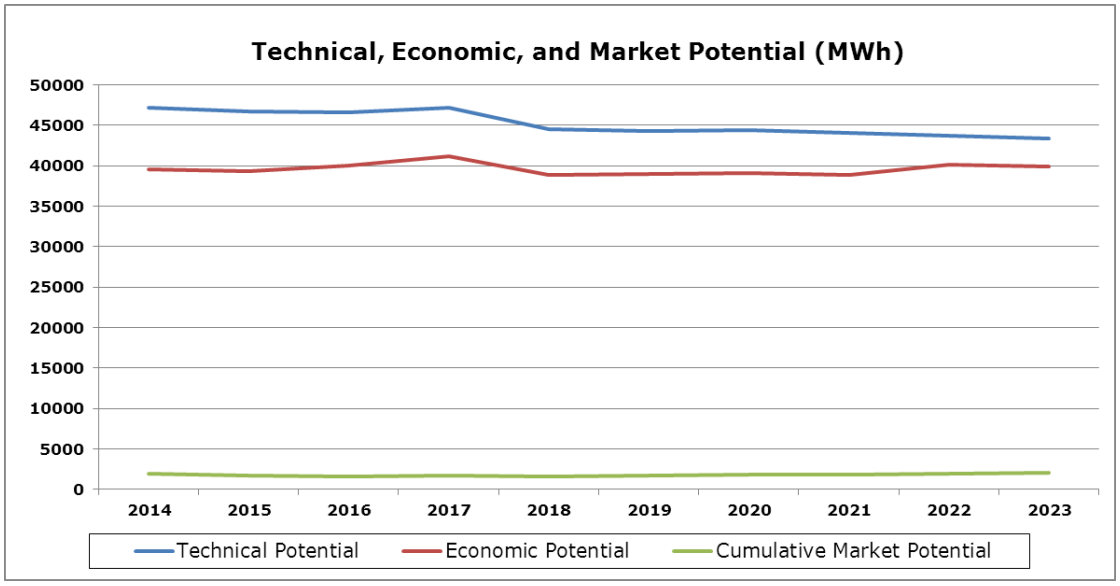
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1	1	1	1	1	2	2	2	3	3
Commercial	24	24	24	24	23	23	22	22	20	18
Industrial & Agriculture	4	4	4	4	4	4	4	3	3	3
Total All Buildings	**30**	**30**	**29**	**29**	**28**	**28**	**28**	**27**	**26**	**24**
% of Forecast Sales	**0.66%**	**0.66%**	**0.64%**	**0.64%**	**0.63%**	**0.63%**	**0.62%**	**0.61%**	**0.58%**	**0.54%**
Utility Re-Participation	5	0	0	0	3	1	1	2	3	3
Total All Buildings (includes Re-participation)	**34**	**30**	**29**	**29**	**31**	**29**	**29**	**29**	**29**	**27**
% of Sales with Re-Participation	**0.76%**	**0.67%**	**0.65%**	**0.65%**	**0.70%**	**0.65%**	**0.65%**	**0.64%**	**0.65%**	**0.61%**
Codes & Standards	**12**	**9**	**13**	**14**	**16**	**15**	**15**	**15**	**13**	**12**
Incremental & Codes and Standard Effects as % of Forecast	**1.02%**	**0.87%**	**0.95%**	**0.95%**	**1.04%**	**1.00%**	**0.99%**	**0.97%**	**0.95%**	**0.88%**

PLUMAS-SIERRA RURAL ELECTRIC COOP



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**126**	**128**	**144**	**146**	**133**	**128**	**178**	**150**	**233**	**198**
Total Energy Use (GWh):	161.12	161.39	162.17	162.19	161.76	161.78	161.80	161.81	161.82	161.84
Residential Sector Energy Use (GWH):	67.67	67.78	68.11	68.12	67.94	67.95	67.96	67.96	67.96	67.97
Commercial Sector Energy Use (GWH):	83.78	83.92	84.33	84.34	84.11	84.13	84.14	84.14	84.14	84.15
Industrial Sector Energy Use (GWH):	9.67	9.68	9.73	9.73	9.71	9.71	9.71	9.71	9.71	9.71
Target as Percent of Total	***0.08%***	***0.08%***	***0.09%***	***0.09%***	***0.08%***	***0.08%***	***0.11%***	***0.09%***	***0.14%***	***0.12%***
Electric Demand										
Adopted Target (MW)	**0.07**	**0.07**	**0.08**	**0.08**	**0.07**	**0.07**	**0.07**	**0.07**	**0.11**	**0.11**
Total Demand (MW):	31.00	31.30	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50
Residential Demand (MW):	13.02	13.15	13.23	13.23	13.23	13.23	13.23	13.23	13.23	13.23
Commercial Demand (MW):	16.12	16.28	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
Industrial Demand (MW):	1.86	1.88	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89
Target as Percent of Total	***0.22%***	***0.22%***	***0.24%***	***0.24%***	***0.23%***	***0.21%***	***0.23%***	***0.23%***	***0.36%***	***0.35%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	16,489	15,819	15,644	15,801	14,079	13,900	13,978	13,927	13,875	13,826
Commercial	29,273	29,473	29,621	30,075	29,133	29,111	29,125	28,827	28,587	28,269
Industrial & Agriculture	1,420	1,381	1,347	1,328	1,304	1,307	1,309	1,310	1,311	1,312
Total All Buildings	**47,181**	**46,674**	**46,612**	**47,204**	**44,516**	**44,318**	**44,412**	**44,063**	**43,773**	**43,407**
% of Forecast Sales	29.28%	28.92%	28.74%	29.10%	27.52%	27.39%	27.45%	27.23%	27.05%	26.82%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	9,304	8,404	7,673	7,893	7,943	8,173	8,396	8,551	8,710	8,869
Commercial	8,120	8,056	8,089	8,201	8,021	8,051	8,091	8,023	7,973	7,897
Industrial & Agricultural	253	250	247	246	243	244	244	244	245	245
Total All Buildings	**17,677**	**16,710**	**16,009**	**16,340**	**16,207**	**16,468**	**16,731**	**16,818**	**16,927**	**17,011**
% of Forecast Sales	57.02%	53.39%	50.82%	51.87%	51.45%	52.28%	53.11%	53.39%	53.74%	54.00%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	10,732	10,302	10,929	11,709	10,180	10,254	10,419	10,440	11,886	11,969
Commercial	27,460	27,652	27,849	28,206	27,446	27,442	27,473	27,193	26,970	26,669
Industrial & Agriculture	1,380	1,341	1,263	1,266	1,264	1,266	1,269	1,270	1,292	1,307
Total All Buildings	**39,572**	**39,295**	**40,041**	**41,181**	**38,890**	**38,962**	**39,161**	**38,903**	**40,148**	**39,945**
% of Forecast Sales	24.56%	24.35%	24.69%	25.39%	24.04%	24.08%	24.20%	24.04%	24.81%	24.68%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,139	6,453	5,766	6,052	6,290	6,512	6,728	6,898	7,069	7,241
Commercial	7,038	6,981	7,049	7,144	7,013	7,053	7,104	7,046	7,006	6,941
Industrial & Agriculture	246	242	236	236	236	236	237	237	241	244
Total All Buildings	**14,422**	**13,676**	**13,050**	**13,432**	**13,538**	**13,801**	**14,069**	**14,181**	**14,316**	**14,426**
% of Forecast Sales	46.52%	43.69%	41.43%	42.64%	42.98%	43.81%	44.66%	45.02%	45.45%	45.80%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,545	1,362	1,220	1,243	1,121	1,206	1,298	1,393	1,490	1,591
Commercial	272	279	285	293	297	304	310	315	321	325
Industrial & Agriculture	111	124	135	147	158	168	168	177	183	189
Total All Buildings	**1,929**	**1,765**	**1,640**	**1,682**	**1,575**	**1,677**	**1,776**	**1,885**	**1,994**	**2,105**
% of Forecast Sales	1.20%	1.09%	1.01%	1.04%	0.97%	1.04%	1.10%	1.17%	1.23%	1.30%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,747	3,090	2,434	2,484	2,512	2,573	2,635	2,696	2,756	2,816
Commercial	46	46	47	47	47	47	48	48	49	49
Industrial & Agriculture	21	23	25	27	29	31	31	33	34	35
Total All Buildings	**3,815**	**3,159**	**2,506**	**2,558**	**2,588**	**2,652**	**2,714**	**2,777**	**2,839**	**2,901**
% of Forecast Sales	12.31%	10.09%	7.96%	8.12%	8.22%	8.42%	8.62%	8.82%	9.01%	9.21%

Incremental Market Potential

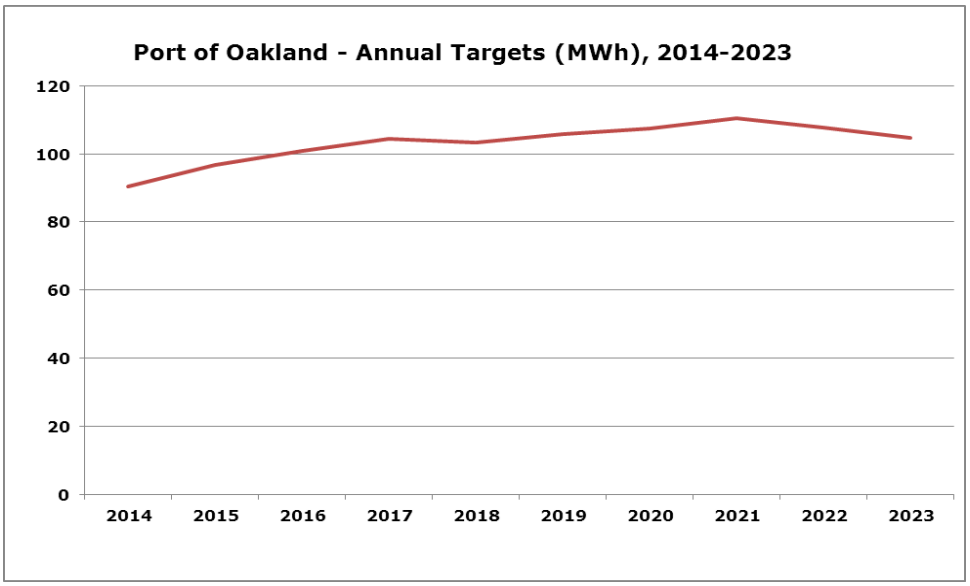
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	67	73	83	100	85	91	97	101	105	108
Commercial	7	8	9	8	8	8	7	7	6	6
Industrial & Agriculture	12	13	13	12	11	10	10	9	8	7
Total All Buildings	**86**	**94**	**105**	**120**	**104**	**109**	**114**	**117**	**119**	**121**
% of Forecast Sales	**0.05%**	**0.06%**	**0.06%**	**0.07%**	**0.06%**	**0.07%**	**0.07%**	**0.07%**	**0.07%**	**0.07%**
Utility Re-Participation	41	33	39	26	29	19	64	34	114	77
Total All Buildings (includes Re-participation)	**126**	**128**	**144**	**146**	**133**	**128**	**178**	**150**	**233**	**198**
% of Sales with Re-Participation	**0.08%**	**0.08%**	**0.09%**	**0.09%**	**0.08%**	**0.08%**	**0.11%**	**0.09%**	**0.14%**	**0.12%**
Codes & Standards	**247**	**353**	**425**	**430**	**652**	**654**	**638**	**614**	**564**	**491**
Incremental & Codes and Standard Effects as % of Forecast	**0.23%**	**0.30%**	**0.35%**	**0.36%**	**0.49%**	**0.48%**	**0.50%**	**0.47%**	**0.49%**	**0.43%**

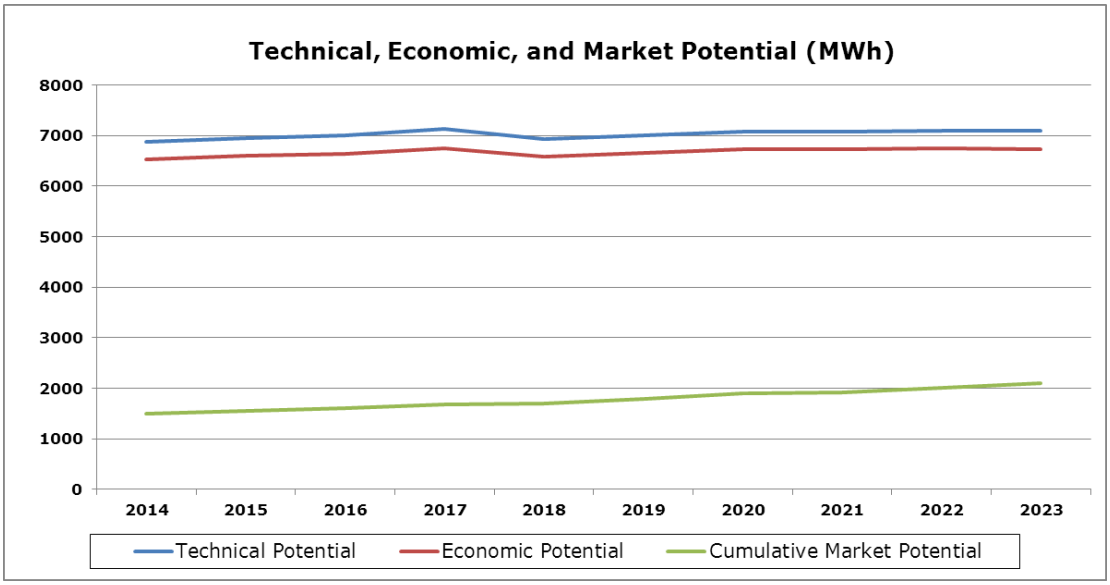
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	62	62	62	64	61	62	62	62	62	62
Commercial	0	1	1	1	1	1	0	0	0	0
Industrial & Agriculture	2	2	2	2	2	2	2	2	2	1
Total All Buildings	**65**	**65**	**64**	**66**	**64**	**64**	**64**	**64**	**64**	**64**
% of Forecast Sales	**0.21%**	**0.21%**	**0.20%**	**0.21%**	**0.20%**	**0.20%**	**0.20%**	**0.20%**	**0.20%**	**0.20%**
Utility Re-Participation	4	4	11	9	8	2	9	8	49	46
Total All Buildings (includes Re-participation)	**69**	**69**	**75**	**75**	**71**	**66**	**74**	**72**	**113**	**110**
% of Sales with Re-Participation	**0.22%**	**0.22%**	**0.24%**	**0.24%**	**0.23%**	**0.21%**	**0.23%**	**0.23%**	**0.36%**	**0.35%**
Codes & Standards	**139**	**214**	**313**	**319**	**345**	**342**	**340**	**319**	**276**	**252**
Incremental & Codes and Standard Effects as % of Forecast	**0.67%**	**0.91%**	**1.23%**	**1.25%**	**1.32%**	**1.30%**	**1.31%**	**1.24%**	**1.24%**	**1.15%**

PORT OF OAKLAND



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**91**	**97**	**101**	**104**	**103**	**106**	**108**	**111**	**108**	**105**
Total Energy Use (GWh):	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00
Residential Sector Energy Use (GWH):	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28
Commercial Sector Energy Use (GWH):	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69
Industrial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.13%***	***0.14%***	***0.14%***	***0.15%***	***0.15%***	***0.15%***	***0.15%***	***0.16%***	***0.15%***	***0.15%***
Electric Demand										
Adopted Target (MW)	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
Total Demand (MW):	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Residential Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.19%***	***0.20%***	***0.21%***	***0.21%***	***0.21%***	***0.21%***	***0.22%***	***0.23%***	***0.22%***	***0.21%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	6,879	6,951	7,006	7,130	6,934	6,997	7,070	7,074	7,094	7,086
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**6,879**	**6,951**	**7,006**	**7,130**	**6,934**	**6,997**	**7,070**	**7,074**	**7,094**	**7,086**
% of Forecast Sales	10.55%	10.66%	10.74%	10.93%	10.63%	10.73%	10.84%	10.84%	10.87%	10.86%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	1,683	1,699	1,710	1,737	1,702	1,720	1,740	1,744	1,753	1,753
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**1,683**	**1,699**	**1,710**	**1,737**	**1,702**	**1,720**	**1,740**	**1,744**	**1,753**	**1,753**
% of Forecast Sales	14.49%	14.63%	14.72%	14.95%	14.65%	14.80%	14.98%	15.01%	15.09%	15.09%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	6,531	6,594	6,644	6,742	6,584	6,647	6,720	6,723	6,743	6,735
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**6,531**	**6,594**	**6,644**	**6,742**	**6,584**	**6,647**	**6,720**	**6,723**	**6,743**	**6,735**
% of Forecast Sales	10.01%	10.11%	10.19%	10.34%	10.09%	10.19%	10.30%	10.31%	10.34%	10.33%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	1,460	1,472	1,485	1,506	1,480	1,497	1,518	1,522	1,530	1,531
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**1,460**	**1,472**	**1,485**	**1,506**	**1,480**	**1,497**	**1,518**	**1,522**	**1,530**	**1,531**
% of Forecast Sales	12.57%	12.67%	12.79%	12.96%	12.74%	12.89%	13.07%	13.10%	13.17%	13.18%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	1,504	1,555	1,607	1,683	1,695	1,798	1,903	1,923	2,016	2,097
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**1,504**	**1,555**	**1,607**	**1,683**	**1,695**	**1,798**	**1,903**	**1,923**	**2,016**	**2,097**
% of Forecast Sales	2.31%	2.38%	2.46%	2.58%	2.60%	2.76%	2.92%	2.95%	3.09%	3.21%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	371	382	394	411	416	439	462	462	483	501
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**371**	**382**	**394**	**411**	**416**	**439**	**462**	**462**	**483**	**501**
% of Forecast Sales	3.19%	3.29%	3.39%	3.54%	3.58%	3.78%	3.98%	3.98%	4.16%	4.31%

Incremental Market Potential

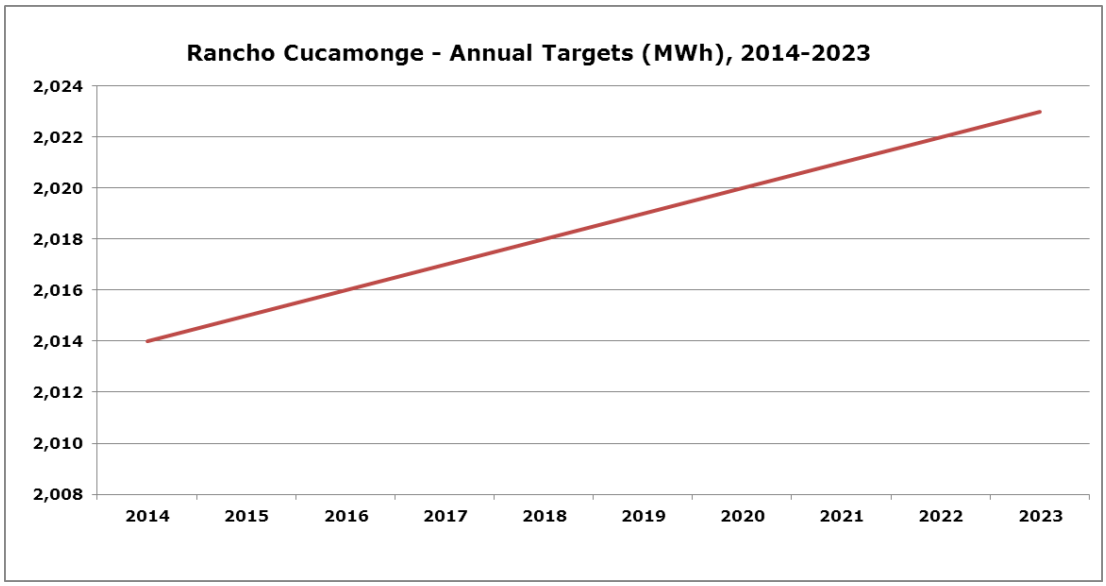
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	91	97	101	104	103	106	108	111	108	105
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**91**	**97**	**101**	**104**	**103**	**106**	**108**	**111**	**108**	**105**
% of Forecast Sales	**0.14%**	**0.15%**	**0.15%**	**0.16%**	**0.16%**	**0.16%**	**0.16%**	**0.17%**	**0.17%**	**0.16%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**91**	**97**	**101**	**104**	**103**	**106**	**108**	**111**	**108**	**105**
% of Sales with Re-Participation	**0.14%**	**0.15%**	**0.15%**	**0.16%**	**0.16%**	**0.16%**	**0.16%**	**0.17%**	**0.17%**	**0.16%**
Codes & Standards	**21**	**32**	**43**	**48**	**60**	**60**	**60**	**60**	**51**	**48**
Incremental & Codes and Standard Effects as % of Forecast	**0.17%**	**0.20%**	**0.22%**	**0.23%**	**0.25%**	**0.25%**	**0.26%**	**0.26%**	**0.24%**	**0.23%**

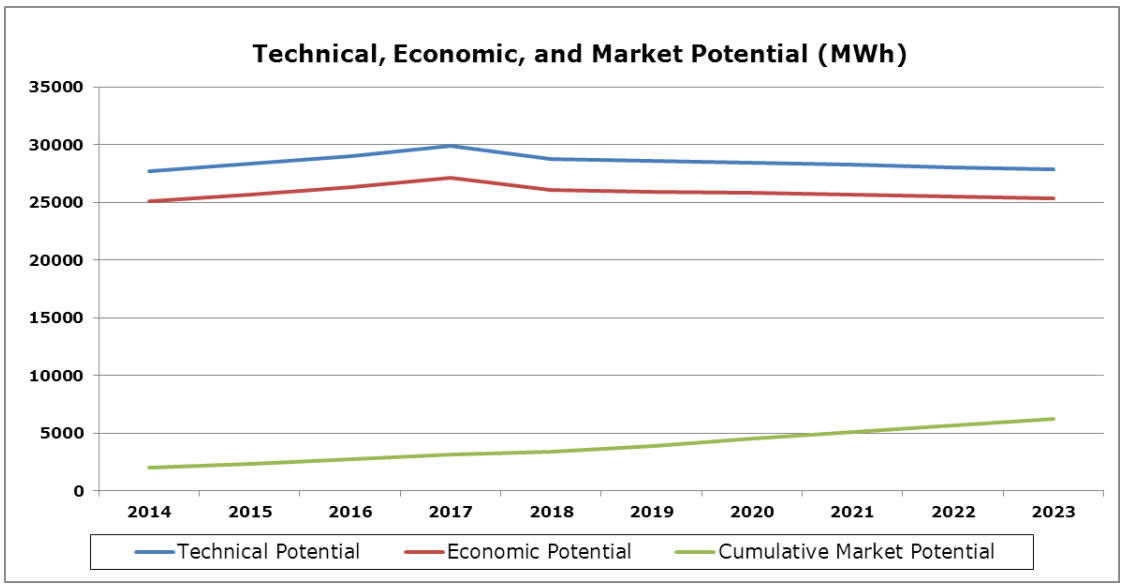
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	21	22	23	23	23	23	24	25	24	24
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**21**	**22**	**23**	**23**	**23**	**23**	**24**	**25**	**24**	**24**
% of Forecast Sales	**0.18%**	**0.19%**	**0.19%**	**0.20%**	**0.20%**	**0.20%**	**0.21%**	**0.21%**	**0.21%**	**0.20%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**21**	**22**	**23**	**23**	**23**	**23**	**24**	**25**	**24**	**24**
% of Sales with Re-Participation	**0.18%**	**0.19%**	**0.19%**	**0.20%**	**0.20%**	**0.20%**	**0.21%**	**0.21%**	**0.21%**	**0.20%**
Codes & Standards	**4**	**7**	**9**	**10**	**13**	**13**	**13**	**13**	**12**	**11**
Incremental & Codes and Standard Effects as % of Forecast	**0.21%**	**0.25%**	**0.28%**	**0.29%**	**0.31%**	**0.32%**	**0.32%**	**0.33%**	**0.31%**	**0.30%**

RANCHO CUCAMONGA MUNCIPAL UTILITY



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**441**	**449**	**470**	**509**	**550**	**598**	**600**	**656**	**634**	**711**
Total Energy Use (GWh):	100.43	102.44	104.49	106.58	108.71	110.88	113.10	115.36	117.67	120.02
Residential Sector Energy Use (GWH):	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Commercial Sector Energy Use (GWH):	67.71	69.04	70.39	71.77	73.18	74.62	76.08	77.57	79.09	80.64
Industrial Sector Energy Use (GWH):	31.30	31.98	32.68	33.39	34.11	34.85	35.60	36.38	37.16	37.96
Target as Percent of Total	***0.44%***	***0.44%***	***0.45%***	***0.48%***	***0.51%***	***0.54%***	***0.53%***	***0.57%***	***0.54%***	***0.59%***
Electric Demand										
Adopted Target (MW)	**0.09**	**0.09**	**0.10**	**0.10**	**0.11**	**0.11**	**0.12**	**0.13**	**0.13**	**0.15**
Total Demand (MW):	24.54	25.02	25.51	26.01	26.52	27.04	27.58	28.12	28.67	29.23
Residential Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Demand (MW):	24.54	25.02	25.51	26.01	26.52	27.04	27.58	28.12	28.67	29.23
Target as Percent of Total	***0.35%***	***0.37%***	***0.38%***	***0.40%***	***0.40%***	***0.42%***	***0.44%***	***0.47%***	***0.44%***	***0.52%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	447	425	417	418	383	382	381	380	378	377
Commercial	25,920	26,588	27,210	28,133	26,951	26,777	26,633	26,382	26,137	25,896
Industrial & Agriculture	1,322	1,332	1,343	1,363	1,384	1,416	1,448	1,480	1,513	1,547
Total All Buildings	**27,689**	**28,345**	**28,971**	**29,915**	**28,719**	**28,574**	**28,462**	**28,243**	**28,029**	**27,820**
% of Forecast Sales	27.57%	27.67%	27.73%	28.07%	26.42%	25.77%	25.17%	24.48%	23.82%	23.18%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	133	116	104	105	101	101	101	101	101	101
Commercial	5,526	5,543	5,659	5,850	5,624	5,604	5,589	5,540	5,493	5,446
Industrial & Agricultural	241	245	249	253	258	264	270	276	282	289
Total All Buildings	**5,901**	**5,904**	**6,012**	**6,208**	**5,983**	**5,969**	**5,961**	**5,918**	**5,876**	**5,835**
% of Forecast Sales	24.04%	23.59%	23.56%	23.86%	22.56%	22.07%	21.62%	21.05%	20.50%	19.96%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	380	382	381	382	343	344	343	342	341	339
Commercial	23,432	23,967	24,655	25,371	24,345	24,198	24,081	23,857	23,639	23,423
Industrial & Agriculture	1,307	1,317	1,307	1,337	1,368	1,399	1,431	1,463	1,496	1,529
Total All Buildings	**25,118**	**25,666**	**26,343**	**27,090**	**26,055**	**25,941**	**25,855**	**25,662**	**25,475**	**25,292**
% of Forecast Sales	25.01%	25.06%	25.21%	25.42%	23.97%	23.40%	22.86%	22.25%	21.65%	21.07%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	75	73	71	71	66	66	66	65	65	65
Commercial	4,802	4,816	4,951	5,107	4,912	4,899	4,891	4,850	4,810	4,770
Industrial & Agriculture	238	242	244	249	255	261	267	273	279	285
Total All Buildings	**5,115**	**5,131**	**5,266**	**5,427**	**5,233**	**5,225**	**5,224**	**5,188**	**5,154**	**5,120**
% of Forecast Sales	20.84%	20.50%	20.64%	20.86%	19.73%	19.32%	18.94%	18.45%	17.98%	17.52%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3	8	14	22	30	41	53	67	81	94
Commercial	1,934	2,236	2,547	2,927	3,051	3,491	3,957	4,427	4,907	5,362
Industrial & Agriculture	51	89	139	202	278	368	467	571	673	764
Total All Buildings	**1,989**	**2,334**	**2,700**	**3,151**	**3,359**	**3,899**	**4,477**	**5,065**	**5,660**	**6,220**
% of Forecast Sales	1.98%	2.28%	2.58%	2.96%	3.09%	3.52%	3.96%	4.39%	4.81%	5.18%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1	2	3	5	7	10	13	16	19	23
Commercial	420	475	541	620	647	739	835	932	1,031	1,123
Industrial & Agriculture	9	16	26	38	52	69	87	106	125	143
Total All Buildings	**430**	**494**	**570**	**663**	**706**	**817**	**935**	**1,055**	**1,176**	**1,288**
% of Forecast Sales	1.75%	1.97%	2.23%	2.55%	2.66%	3.02%	3.39%	3.75%	4.10%	4.41%

Incremental Market Potential

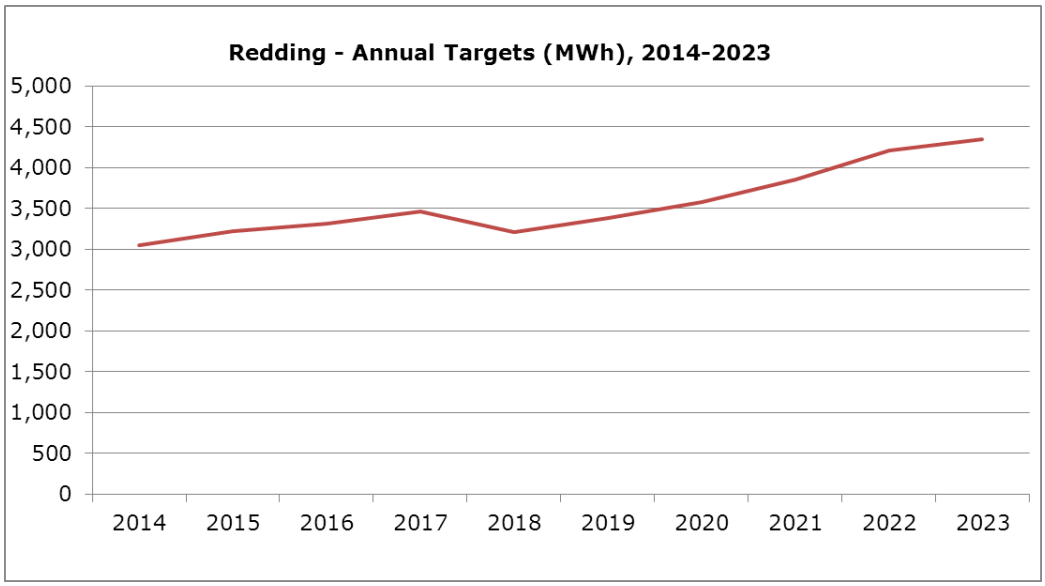
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3	5	6	8	9	11	13	14	15	14
Commercial	376	389	407	429	428	450	469	482	484	477
Industrial & Agriculture	29	39	50	64	77	90	100	105	103	95
Total All Buildings	**408**	**432**	**463**	**501**	**514**	**551**	**582**	**601**	**602**	**586**
% of Forecast Sales	**0.41%**	**0.42%**	**0.44%**	**0.47%**	**0.47%**	**0.50%**	**0.51%**	**0.52%**	**0.51%**	**0.49%**
Utility Re-Participation	33	17	7	8	36	47	18	55	31	126
Total All Buildings (includes Re-participation)	**441**	**449**	**470**	**509**	**550**	**598**	**600**	**656**	**634**	**711**
% of Sales with Re-Participation	**0.44%**	**0.44%**	**0.45%**	**0.48%**	**0.51%**	**0.54%**	**0.53%**	**0.57%**	**0.54%**	**0.59%**
Codes & Standards	**128**	**169**	**218**	**229**	**298**	**295**	**291**	**288**	**218**	**192**
Incremental & Codes and Standard Effects as % of Forecast	**0.53%**	**0.59%**	**0.65%**	**0.69%**	**0.75%**	**0.76%**	**0.77%**	**0.77%**	**0.70%**	**0.65%**

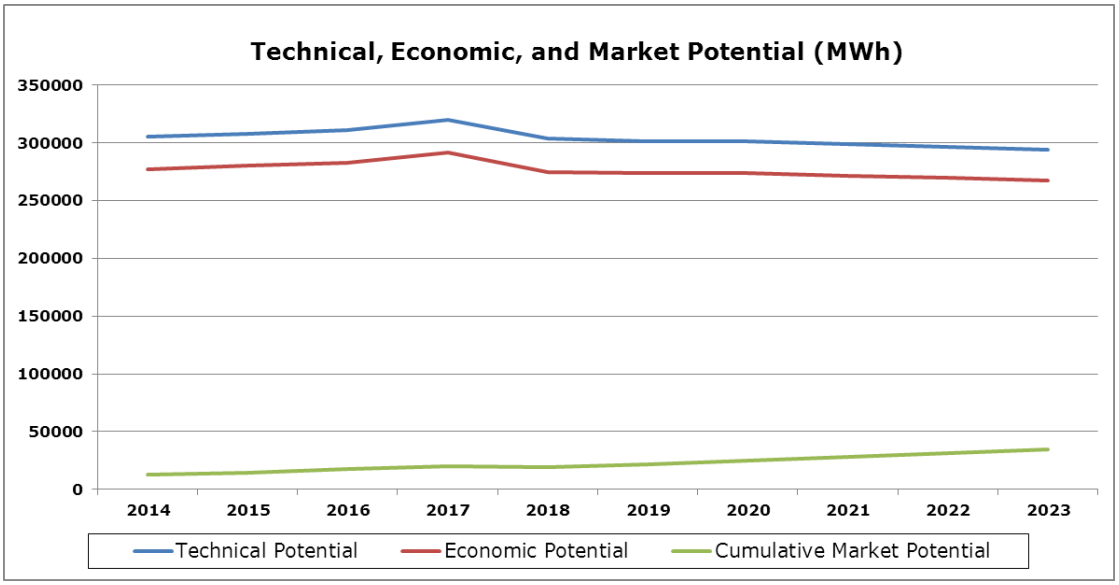
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1	1	1	2	2	3	3	3	3	3
Commercial	78	81	84	89	88	93	97	99	100	98
Industrial & Agriculture	5	7	9	12	14	17	19	20	19	18
Total All Buildings	**84**	**89**	**95**	**102**	**104**	**112**	**118**	**122**	**122**	**119**
% of Forecast Sales	**0.34%**	**0.36%**	**0.37%**	**0.39%**	**0.39%**	**0.41%**	**0.43%**	**0.43%**	**0.43%**	**0.41%**
Utility Re-Participation	3	3	1	2	1	3	2	10	4	33
Total All Buildings (includes Re-participation)	**87**	**92**	**96**	**104**	**106**	**115**	**121**	**132**	**126**	**152**
% of Sales with Re-Participation	**0.35%**	**0.37%**	**0.38%**	**0.40%**	**0.40%**	**0.42%**	**0.44%**	**0.47%**	**0.44%**	**0.52%**
Codes & Standards	**68**	**33**	**45**	**47**	**61**	**61**	**60**	**59**	**49**	**44**
Incremental & Codes and Standard Effects as % of Forecast	**0.62%**	**0.49%**	**0.55%**	**0.57%**	**0.63%**	**0.64%**	**0.65%**	**0.65%**	**0.60%**	**0.56%**

REDDING ELECTRIC UTILITY



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**3,045**	**3,224**	**3,318**	**3,458**	**3,207**	**3,384**	**3,581**	**3,857**	**4,207**	**4,349**
Total Energy Use (GWh):	777.17	781.22	789.75	798.74	808.20	818.17	828.61	839.54	850.97	862.90
Residential Sector Energy Use (GWH):	365.63	367.54	371.55	375.78	380.24	384.92	389.83	394.98	400.36	405.97
Commercial Sector Energy Use (GWH):	351.25	353.08	356.94	361.00	365.28	369.78	374.50	379.44	384.61	390.00
Industrial Sector Energy Use (GWH):	10.69	10.75	10.86	10.99	11.12	11.26	11.40	11.55	11.71	11.87
Target as Percent of Total	***0.39%***	***0.41%***	***0.42%***	***0.43%***	***0.40%***	***0.41%***	***0.43%***	***0.46%***	***0.49%***	***0.50%***
Electric Demand										
Adopted Target (MW)	**0.89**	**0.82**	**0.82**	**0.94**	**0.99**	**1.08**	**1.17**	**1.32**	**1.46**	**1.54**
Total Demand (MW):	252.60	255.70	258.90	262.20	265.50	268.90	272.40	276.00	279.70	284.10
Residential Demand (MW):	118.84	120.30	121.80	123.36	124.91	126.51	128.16	129.85	131.59	133.66
Commercial Demand (MW):	114.17	115.57	117.01	118.51	120.00	121.53	123.12	124.74	126.41	128.40
Industrial Demand (MW):	3.48	3.52	3.56	3.61	3.65	3.70	3.75	3.80	3.85	3.91
Target as Percent of Total	***0.35%***	***0.32%***	***0.32%***	***0.36%***	***0.37%***	***0.40%***	***0.43%***	***0.48%***	***0.52%***	***0.54%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	111,842	108,949	108,318	110,118	101,147	99,790	99,882	99,454	99,029	98,590
Commercial	192,131	196,949	201,182	208,253	201,056	200,262	199,609	197,666	195,921	193,868
Industrial & Agriculture	1,617	1,567	1,524	1,513	1,502	1,523	1,545	1,566	1,588	1,612
Total All Buildings	**305,589**	**307,465**	**311,024**	**319,884**	**303,705**	**301,574**	**301,035**	**298,686**	**296,539**	**294,070**
% of Forecast Sales	39.32%	39.36%	39.38%	40.05%	37.58%	36.86%	36.33%	35.58%	34.85%	34.08%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	50,355	45,855	43,068	43,771	43,486	43,596	43,661	43,618	43,557	43,507
Commercial	43,329	43,771	44,507	45,982	44,648	44,601	44,586	44,203	43,868	43,456
Industrial & Agricultural	285	281	279	279	280	284	288	292	296	301
Total All Buildings	**93,969**	**89,907**	**87,853**	**90,032**	**88,414**	**88,481**	**88,535**	**88,113**	**87,721**	**87,264**
% of Forecast Sales	37.20%	35.16%	33.93%	34.34%	33.30%	32.90%	32.50%	31.92%	31.36%	30.72%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	97,933	96,215	93,676	96,314	85,808	85,414	85,720	85,285	84,859	84,432
Commercial	177,391	182,530	187,525	193,842	187,540	186,887	186,375	184,573	182,966	181,049
Industrial & Agriculture	1,552	1,501	1,397	1,415	1,434	1,454	1,475	1,534	1,556	1,604
Total All Buildings	**276,876**	**280,246**	**282,597**	**291,571**	**274,782**	**273,755**	**273,571**	**271,391**	**269,380**	**267,085**
% of Forecast Sales	35.63%	35.87%	35.78%	36.50%	34.00%	33.46%	33.02%	32.33%	31.66%	30.95%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	33,265	30,957	25,975	28,241	27,562	27,519	27,442	27,369	27,311	27,253
Commercial	37,369	38,125	39,215	40,587	39,456	39,464	39,503	39,173	38,891	38,532
Industrial & Agriculture	273	269	261	264	268	271	275	286	290	299
Total All Buildings	**70,907**	**69,351**	**65,451**	**69,092**	**67,285**	**67,254**	**67,220**	**66,828**	**66,493**	**66,084**
% of Forecast Sales	28.07%	27.12%	25.28%	26.35%	25.34%	25.01%	24.68%	24.21%	23.77%	23.26%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,086	7,780	9,157	10,605	8,890	9,890	11,487	13,188	14,930	16,729
Commercial	5,511	6,682	7,845	9,165	9,819	11,252	12,713	14,198	15,650	17,117
Industrial & Agriculture	165	217	266	316	362	408	451	493	528	562
Total All Buildings	**12,761**	**14,680**	**17,268**	**20,085**	**19,071**	**21,549**	**24,652**	**27,878**	**31,108**	**34,409**
% of Forecast Sales	1.64%	1.88%	2.19%	2.51%	2.36%	2.63%	2.98%	3.32%	3.66%	3.99%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,368	2,651	2,906	3,462	3,811	4,530	5,325	6,195	7,093	8,038
Commercial	1,108	1,341	1,587	1,863	2,007	2,308	2,616	2,930	3,243	3,557
Industrial & Agriculture	30	40	49	59	68	76	84	92	99	105
Total All Buildings	**4,505**	**4,031**	**4,542**	**5,384**	**5,886**	**6,914**	**8,026**	**9,217**	**10,435**	**11,700**
% of Forecast Sales	1.78%	1.58%	1.75%	2.05%	2.22%	2.57%	2.95%	3.34%	3.73%	4.12%

Incremental Market Potential

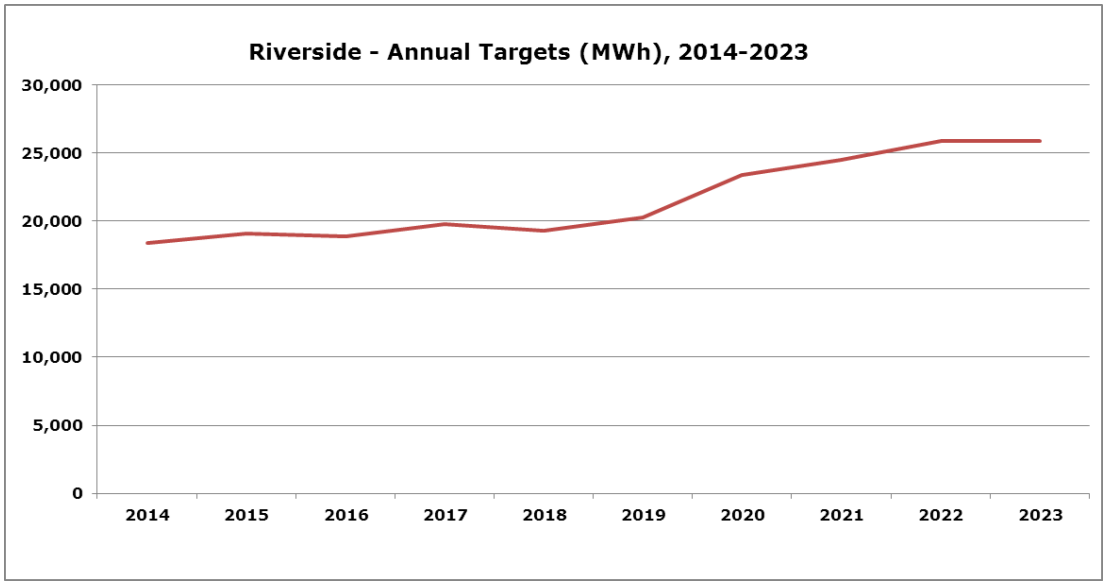
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,420	1,605	1,739	1,907	1,623	1,741	1,874	1,988	2,082	2,149
Commercial	1,306	1,378	1,412	1,456	1,408	1,451	1,493	1,533	1,569	1,587
Industrial & Agriculture	56	57	54	52	50	47	45	43	42	41
Total All Buildings	**2,782**	**3,040**	**3,206**	**3,415**	**3,080**	**3,239**	**3,412**	**3,564**	**3,693**	**3,777**
% of Forecast Sales	**0.36%**	**0.39%**	**0.41%**	**0.43%**	**0.38%**	**0.40%**	**0.41%**	**0.42%**	**0.43%**	**0.44%**
Utility Re-Participation	263	184	112	43	127	145	169	293	515	572
Total All Buildings (includes Re-participation)	**3,045**	**3,224**	**3,318**	**3,458**	**3,207**	**3,384**	**3,581**	**3,857**	**4,207**	**4,349**
% of Sales with Re-Participation	**0.39%**	**0.41%**	**0.42%**	**0.43%**	**0.40%**	**0.41%**	**0.43%**	**0.46%**	**0.49%**	**0.50%**
Codes & Standards	**1,836**	**2,709**	**3,276**	**3,289**	**4,679**	**4,678**	**4,575**	**4,386**	**3,840**	**3,297**
Incremental & Codes and Standard Effects as % of Forecast	**0.63%**	**0.76%**	**0.83%**	**0.84%**	**0.98%**	**0.99%**	**0.98%**	**0.98%**	**0.95%**	**0.89%**

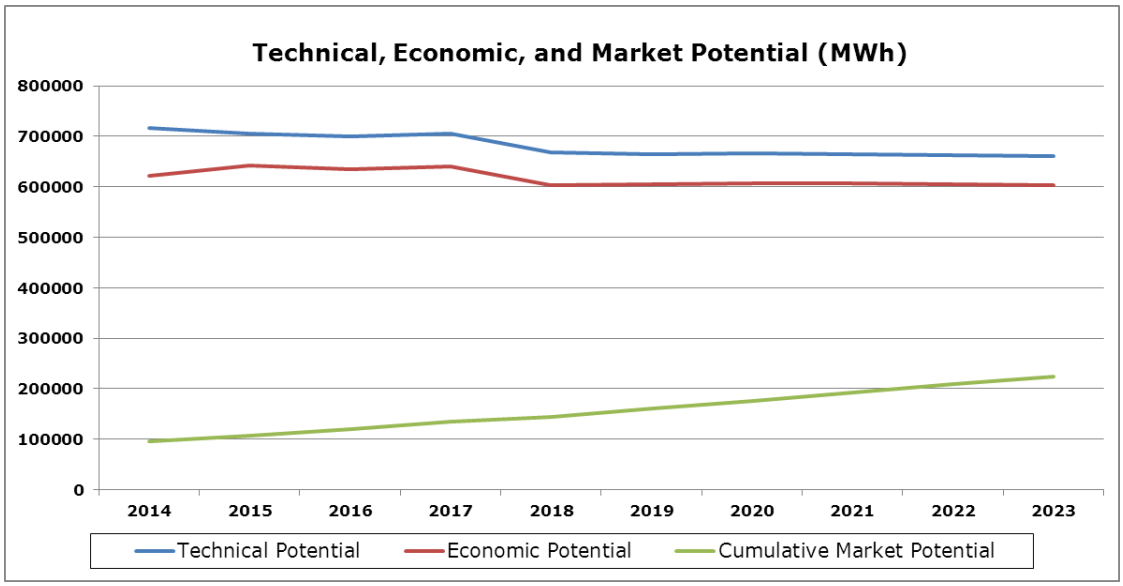
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	416	487	506	619	669	751	831	907	975	1,030
Commercial	273	286	294	303	295	304	314	324	333	338
Industrial & Agriculture	10	10	10	10	9	9	8	8	8	8
Total All Buildings	**699**	**784**	**809**	**932**	**973**	**1,064**	**1,154**	**1,239**	**1,316**	**1,375**
% of Forecast Sales	**0.28%**	**0.31%**	**0.31%**	**0.36%**	**0.37%**	**0.40%**	**0.42%**	**0.45%**	**0.47%**	**0.48%**
Utility Re-Participation	191	32	15	6	12	13	20	78	141	168
Total All Buildings (includes Re-participation)	**890**	**816**	**825**	**937**	**986**	**1,078**	**1,173**	**1,317**	**1,457**	**1,543**
% of Sales with Re-Participation	**0.35%**	**0.32%**	**0.32%**	**0.36%**	**0.37%**	**0.40%**	**0.43%**	**0.48%**	**0.52%**	**0.54%**
Codes & Standards	**960**	**1,351**	**1,723**	**1,750**	**1,931**	**1,914**	**1,897**	**1,696**	**1,272**	**1,038**
Incremental & Codes and Standard Effects as % of Forecast	**0.73%**	**0.85%**	**0.98%**	**1.02%**	**1.10%**	**1.11%**	**1.13%**	**1.09%**	**0.98%**	**0.91%**

RIVERSIDE PUBLIC UTILITIES



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**18,399**	**19,099**	**18,870**	**19,756**	**19,317**	**20,287**	**23,368**	**24,469**	**25,889**	**25,865**
Total Energy Use (GWh):	2,122.99	2,137.94	2,156.63	2,171.58	2,190.27	2,208.96	2,227.65	2,250.07	2,268.76	2,287.61
Residential Sector Energy Use (GWH):	694.88	699.78	705.89	710.79	716.90	723.02	729.14	736.48	742.59	748.76
Commercial Sector Energy Use (GWH):	417.44	420.38	424.05	426.99	430.67	434.34	438.02	442.43	446.10	449.81
Industrial Sector Energy Use (GWH):	979.04	985.93	994.55	1,001.44	1,010.06	1,018.68	1,027.30	1,037.64	1,046.26	1,054.95
Target as Percent of Total	***0.87%***	***0.89%***	***0.87%***	***0.91%***	***0.88%***	***0.92%***	***1.05%***	***1.09%***	***1.14%***	***1.13%***
Electric Demand										
Adopted Target (MW)	**4.66**	**4.41**	**4.44**	**4.86**	**5.15**	**5.65**	**6.50**	**7.09**	**7.93**	**7.88**
Total Demand (MW):	568.00	572.00	577.00	581.00	586.00	591.00	596.00	602.00	607.00	612.04
Residential Demand (MW):	185.91	187.22	188.86	190.17	191.81	193.44	195.08	197.04	198.68	200.33
Commercial Demand (MW):	111.68	112.47	113.45	114.24	115.22	116.21	117.19	118.37	119.35	120.34
Industrial Demand (MW):	261.94	263.78	266.09	267.93	270.24	272.54	274.85	277.62	279.92	282.25
Target as Percent of Total	***0.82%***	***0.77%***	***0.77%***	***0.84%***	***0.88%***	***0.96%***	***1.09%***	***1.18%***	***1.31%***	***1.29%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	306,992	295,489	289,614	290,039	263,518	259,884	260,013	258,768	257,480	256,231
Commercial	256,026	259,255	261,968	267,982	257,200	256,290	256,037	253,873	251,826	249,822
Industrial & Agriculture	153,035	150,616	148,406	147,763	147,348	148,817	150,290	151,902	153,264	154,638
Total All Buildings	**716,054**	**705,360**	**699,988**	**705,785**	**668,066**	**664,991**	**666,340**	**664,543**	**662,570**	**660,691**
% of Forecast Sales	33.73%	32.99%	32.46%	32.50%	30.50%	30.10%	29.91%	29.53%	29.20%	28.88%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	148,313	132,793	122,438	122,869	120,647	121,180	121,498	121,255	121,011	120,772
Commercial	60,518	60,191	60,757	62,099	60,031	60,022	60,189	59,743	59,329	58,925
Industrial & Agricultural	27,528	27,414	27,344	27,397	27,495	27,769	28,044	28,345	28,599	28,855
Total All Buildings	**236,358**	**220,398**	**210,539**	**212,365**	**208,173**	**208,971**	**209,731**	**209,343**	**208,940**	**208,552**
% of Forecast Sales	41.61%	38.53%	36.49%	36.55%	35.52%	35.36%	35.19%	34.77%	34.42%	34.07%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	237,454	257,558	253,828	254,033	224,466	224,323	224,052	222,838	221,606	220,376
Commercial	234,802	236,810	239,492	243,306	234,864	234,190	234,170	233,851	232,015	230,220
Industrial & Agriculture	149,363	146,918	140,941	142,126	143,559	147,119	148,577	150,172	151,520	152,879
Total All Buildings	**621,618**	**641,286**	**634,261**	**639,465**	**602,889**	**605,632**	**606,799**	**606,861**	**605,141**	**603,475**
% of Forecast Sales	29.28%	30.00%	29.41%	29.45%	27.53%	27.42%	27.24%	26.97%	26.67%	26.38%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	91,250	78,349	71,655	71,475	68,745	68,603	68,394	68,229	68,030	67,832
Commercial	51,865	51,560	52,234	53,185	51,630	51,709	51,964	52,532	52,195	51,866
Industrial & Agriculture	26,842	26,724	26,300	26,521	26,788	27,452	27,724	28,022	28,274	28,527
Total All Buildings	**169,958**	**156,633**	**150,189**	**151,181**	**147,163**	**147,764**	**148,083**	**148,784**	**148,499**	**148,225**
% of Forecast Sales	29.92%	27.38%	26.03%	26.02%	25.11%	25.00%	24.85%	24.71%	24.46%	24.22%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	18,910	18,070	21,403	27,039	29,533	37,123	45,897	55,276	64,754	73,803
Commercial	34,266	37,661	40,883	44,673	45,932	49,977	53,886	57,695	61,076	64,207
Industrial & Agriculture	43,392	50,743	57,080	62,996	68,085	72,952	76,798	80,035	82,866	85,356
Total All Buildings	**96,568**	**106,474**	**119,366**	**134,708**	**143,550**	**160,051**	**176,581**	**193,006**	**208,697**	**223,365**
% of Forecast Sales	4.55%	4.98%	5.53%	6.20%	6.55%	7.25%	7.93%	8.58%	9.20%	9.76%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	14,050	7,603	7,715	9,937	12,231	15,573	19,429	23,671	27,960	32,095
Commercial	8,077	8,569	9,362	10,251	10,590	11,499	12,383	13,250	14,019	14,728
Industrial & Agriculture	7,863	9,296	10,565	11,712	12,705	13,613	14,330	14,934	15,463	15,927
Total All Buildings	**29,990**	**25,468**	**27,641**	**31,900**	**35,526**	**40,685**	**46,143**	**51,855**	**57,441**	**62,750**
% of Forecast Sales	5.28%	4.45%	4.79%	5.49%	6.06%	6.88%	7.74%	8.61%	9.46%	10.25%

Incremental Market Potential

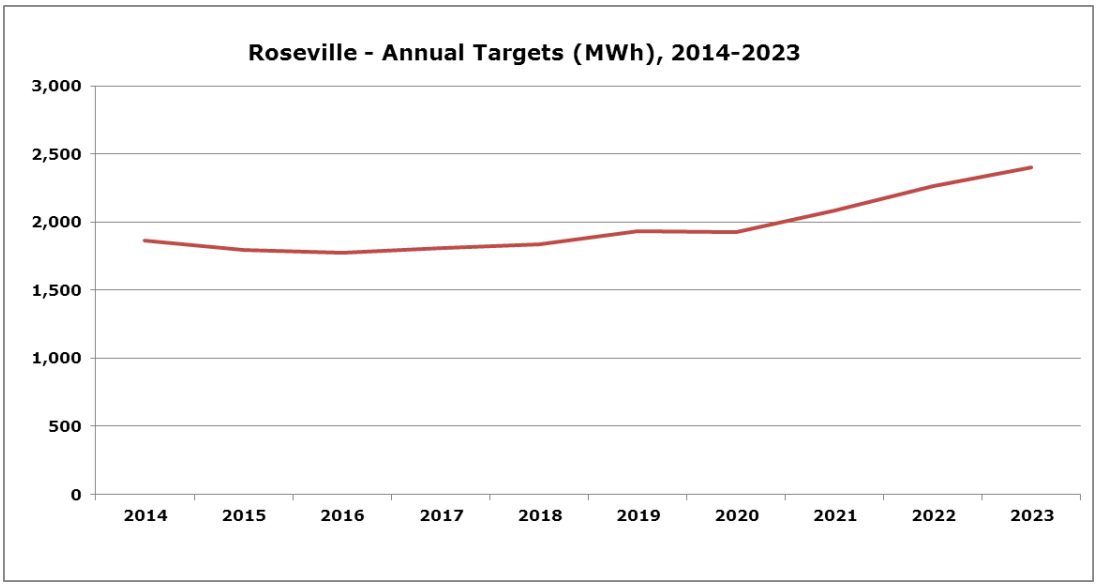
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,331	4,278	5,391	6,655	7,229	8,371	9,336	10,012	10,258	9,943
Commercial	4,822	4,797	4,697	4,593	4,288	4,200	4,113	4,000	3,804	3,530
Industrial & Agriculture	8,773	8,223	7,389	6,616	5,817	5,186	4,745	4,270	3,905	3,577
Total All Buildings	**16,926**	**17,298**	**17,477**	**17,864**	**17,334**	**17,757**	**18,193**	**18,281**	**17,967**	**17,049**
% of Forecast Sales	**0.80%**	**0.81%**	**0.81%**	**0.82%**	**0.79%**	**0.80%**	**0.82%**	**0.81%**	**0.79%**	**0.75%**
Utility Re-Participation	1,472	1,801	1,394	1,891	1,983	2,529	5,175	6,187	7,922	8,816
Total All Buildings (includes Re-participation)	**18,399**	**19,099**	**18,870**	**19,756**	**19,317**	**20,287**	**23,368**	**24,469**	**25,889**	**25,865**
Program Goal % of Sales	**0.87%**	**0.89%**	**0.87%**	**0.91%**	**0.88%**	**0.92%**	**1.05%**	**1.09%**	**1.14%**	**1.13%**
Codes & Standards	**4,164**	**5,807**	**6,691**	**6,614**	**9,746**	**9,768**	**9,537**	**9,054**	**7,958**	**6,657**
Incremental & Codes and Standard Effects as % of Forecast	**0.99%**	**1.08%**	**1.12%**	**1.13%**	**1.24%**	**1.25%**	**1.24%**	**1.21%**	**1.14%**	**1.04%**

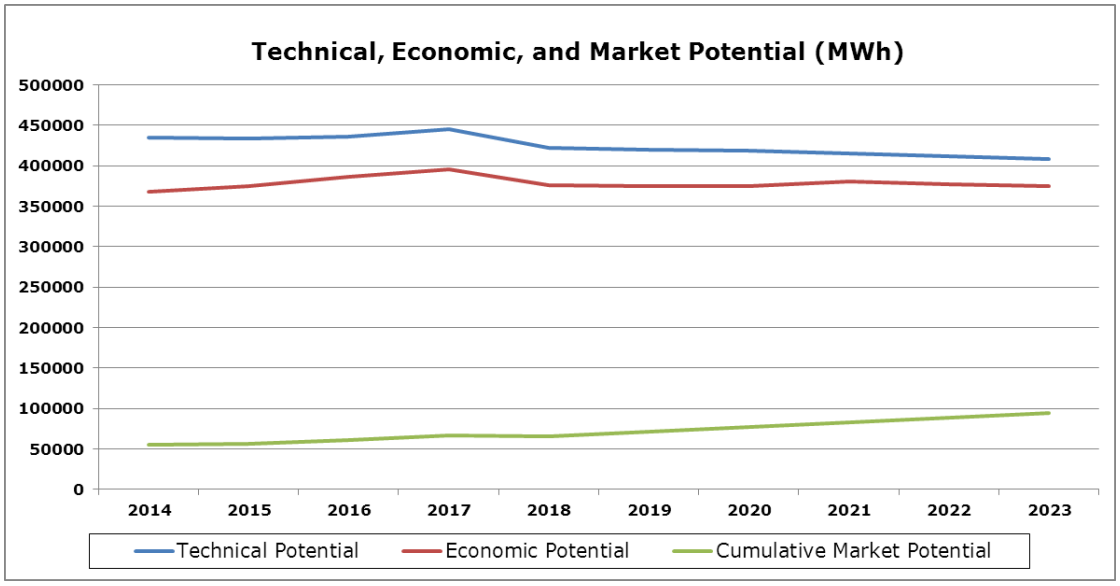
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,341	1,502	1,846	2,359	2,837	3,399	3,916	4,303	4,470	4,358
Commercial	1,113	1,104	1,068	1,028	952	927	905	889	846	784
Industrial & Agriculture	1,602	1,517	1,379	1,235	1,085	968	885	797	729	667
Total All Buildings	**4,056**	**4,123**	**4,293**	**4,621**	**4,874**	**5,294**	**5,707**	**5,989**	**6,045**	**5,810**
% of Forecast Sales	**0.71%**	**0.72%**	**0.74%**	**0.80%**	**0.83%**	**0.90%**	**0.96%**	**0.99%**	**1.00%**	**0.95%**
Utility Re-Participation	601	283	148	244	275	359	795	1,100	1,884	2,067
Total All Buildings (includes Re-participation)	**4,657**	**4,406**	**4,440**	**4,865**	**5,148**	**5,652**	**6,501**	**7,089**	**7,928**	**7,877**
Program Goal % of Sales	**0.82%**	**0.77%**	**0.77%**	**0.84%**	**0.88%**	**0.96%**	**1.09%**	**1.18%**	**1.31%**	**1.29%**
Codes & Standards	**2,605**	**3,729**	**4,656**	**4,666**	**5,006**	**4,964**	**4,922**	**4,349**	**3,190**	**2,565**
Incremental & Codes and Standard Effects as % of Forecast	**1.17%**	**1.37%**	**1.55%**	**1.60%**	**1.69%**	**1.74%**	**1.78%**	**1.72%**	**1.52%**	**1.37%**

ROSEVILLE ELECTRIC UTILITY



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**7,713**	**7,768**	**8,037**	**8,007**	**7,499**	**7,790**	**7,260**	**7,697**	**8,094**	**8,479**
Total Energy Use (GWh):	1,210.05	1,216.40	1,223.05	1,227.31	1,226.90	1,226.49	1,226.08	1,225.68	1,225.27	1,224.86
Residential Sector Energy Use (GWH):	437.42	441.70	445.79	449.74	453.67	457.63	461.62	465.65	469.71	473.81
Commercial Sector Energy Use (GWH):	443.12	446.09	449.22	450.65	450.29	449.94	449.58	449.23	448.87	448.51
Industrial Sector Energy Use (GWH):	329.51	328.61	328.04	326.92	322.94	319.01	315.13	311.30	307.51	303.77
Target as Percent of Total	***0.64%***	***0.64%***	***0.66%***	***0.65%***	***0.61%***	***0.64%***	***0.59%***	***0.63%***	***0.66%***	***0.69%***
Electric Demand										
Adopted Target (MW)	**1.87**	**1.80**	**1.77**	**1.81**	**1.83**	**1.93**	**1.93**	**2.09**	**2.26**	**2.40**
Total Demand (MW):	384.02	394.22	404.38	414.41	424.46	434.14	442.66	442.66	442.66	442.66
Residential Demand (MW):	138.82	143.15	147.39	151.86	156.95	161.98	166.66	168.17	169.69	171.23
Commercial Demand (MW):	140.63	144.57	148.53	152.16	155.78	159.26	162.31	162.24	162.16	162.09
Industrial Demand (MW):	104.57	106.50	108.46	110.38	111.72	112.92	113.77	112.43	111.10	109.78
Target as Percent of Total	***0.49%***	***0.46%***	***0.44%***	***0.44%***	***0.43%***	***0.45%***	***0.44%***	***0.47%***	***0.51%***	***0.54%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	121,150	115,048	112,846	112,727	101,836	100,527	100,751	100,342	99,922	99,515
Commercial	270,798	277,502	283,399	293,327	283,114	281,981	281,083	278,320	275,881	272,977
Industrial & Agriculture	42,491	41,015	39,586	38,808	37,701	37,308	36,920	36,501	36,086	35,677
Total All Buildings	**434,438**	**433,565**	**435,831**	**444,862**	**422,650**	**419,817**	**418,754**	**415,163**	**411,889**	**408,168**
% of Forecast Sales	35.90%	35.64%	35.63%	36.25%	34.45%	34.23%	34.15%	33.87%	33.62%	33.32%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	53,812	47,004	43,433	42,958	42,009	42,128	42,198	42,104	42,019	41,924
Commercial	61,538	62,131	63,144	65,222	63,300	63,232	63,219	62,671	62,202	61,617
Industrial & Agricultural	7,528	7,387	7,254	7,175	7,035	6,962	6,889	6,811	6,734	6,657
Total All Buildings	**122,878**	**116,522**	**113,831**	**115,355**	**112,344**	**112,322**	**112,306**	**111,586**	**110,954**	**110,198**
% of Forecast Sales	32.00%	29.56%	28.15%	27.84%	26.47%	25.87%	25.37%	25.21%	25.07%	24.89%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	77,893	78,576	85,891	86,869	76,569	76,927	77,043	85,302	84,956	84,990
Commercial	249,371	256,991	263,641	272,450	263,510	262,583	261,889	259,329	257,090	254,384
Industrial & Agriculture	40,773	39,301	36,449	36,392	36,016	35,644	36,267	35,856	35,449	35,658
Total All Buildings	**368,037**	**374,868**	**385,981**	**395,711**	**376,095**	**375,155**	**375,199**	**380,487**	**377,495**	**375,033**
% of Forecast Sales	30.42%	30.82%	31.56%	32.24%	30.65%	30.59%	30.60%	31.04%	30.81%	30.62%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	31,938	29,697	25,758	25,728	26,455	26,420	26,348	26,278	26,207	26,137
Commercial	52,934	54,015	55,538	57,460	55,829	55,840	55,905	55,434	55,042	54,532
Industrial & Agriculture	7,207	7,067	6,801	6,791	6,721	6,651	6,767	6,691	6,615	6,654
Total All Buildings	**92,079**	**90,778**	**88,097**	**89,979**	**89,005**	**88,911**	**89,020**	**88,402**	**87,864**	**87,323**
% of Forecast Sales	23.98%	23.03%	21.79%	21.71%	20.97%	20.48%	20.11%	19.97%	19.85%	19.73%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	10,034	8,612	10,236	11,569	9,461	10,769	12,835	14,817	16,869	18,999
Commercial	35,140	37,336	39,360	42,105	41,538	44,698	47,841	50,798	53,642	56,194
Industrial & Agriculture	9,722	10,947	11,990	13,258	14,375	15,536	16,739	17,765	18,611	19,366
Total All Buildings	**54,895**	**56,895**	**61,586**	**66,931**	**65,374**	**71,003**	**77,415**	**83,380**	**89,122**	**94,558**
% of Forecast Sales	4.54%	4.68%	5.04%	5.45%	5.33%	5.79%	6.31%	6.80%	7.27%	7.72%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,573	2,027	2,358	2,867	3,127	3,957	4,881	5,838	6,834	7,882
Commercial	7,722	8,134	8,588	9,180	9,074	9,740	10,391	10,994	11,581	12,098
Industrial & Agriculture	1,659	1,931	2,181	2,446	2,682	2,899	3,123	3,315	3,473	3,614
Total All Buildings	**13,954**	**12,093**	**13,128**	**14,493**	**14,883**	**16,596**	**18,396**	**20,146**	**21,889**	**23,594**
% of Forecast Sales	3.63%	3.07%	3.25%	3.50%	3.51%	3.82%	4.16%	4.55%	4.94%	5.33%

Incremental Market Potential

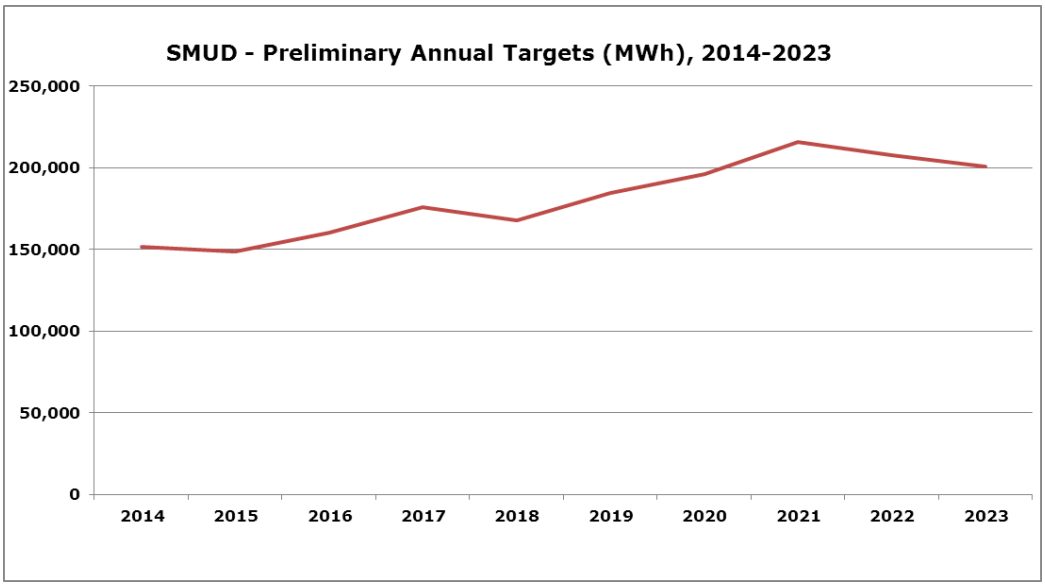
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,157	1,440	2,142	2,263	1,865	1,990	2,142	2,428	2,531	2,599
Commercial	3,713	3,707	3,633	3,566	3,326	3,273	3,226	3,183	3,134	3,027
Industrial & Agriculture	1,888	1,813	1,687	1,601	1,495	1,375	1,254	1,147	1,049	963
Total All Buildings	**6,758**	**6,960**	**7,462**	**7,430**	**6,687**	**6,637**	**6,623**	**6,757**	**6,714**	**6,589**
% of Forecast Sales	**0.56%**	**0.57%**	**0.61%**	**0.61%**	**0.55%**	**0.54%**	**0.54%**	**0.55%**	**0.55%**	**0.54%**
Utility Re-Participation	732	598	499	598	1,134	1,954	959	1,703	2,529	3,596
Total All Buildings (includes Re-participation)	**7,490**	**7,558**	**7,961**	**8,028**	**7,821**	**8,591**	**7,582**	**8,460**	**9,243**	**10,185**
% of Sales with Re-Participation	**0.62%**	**0.62%**	**0.65%**	**0.65%**	**0.64%**	**0.70%**	**0.62%**	**0.69%**	**0.75%**	**0.83%**
Codes & Standards	**2,403**	**3,467**	**4,200**	**4,256**	**5,863**	**5,868**	**5,765**	**5,581**	**4,911**	**4,319**
Incremental & Codes and Standard Effects as % of Forecast	**0.82%**	**0.91%**	**0.99%**	**1.00%**	**1.12%**	**1.18%**	**1.09%**	**1.15%**	**1.16%**	**1.18%**

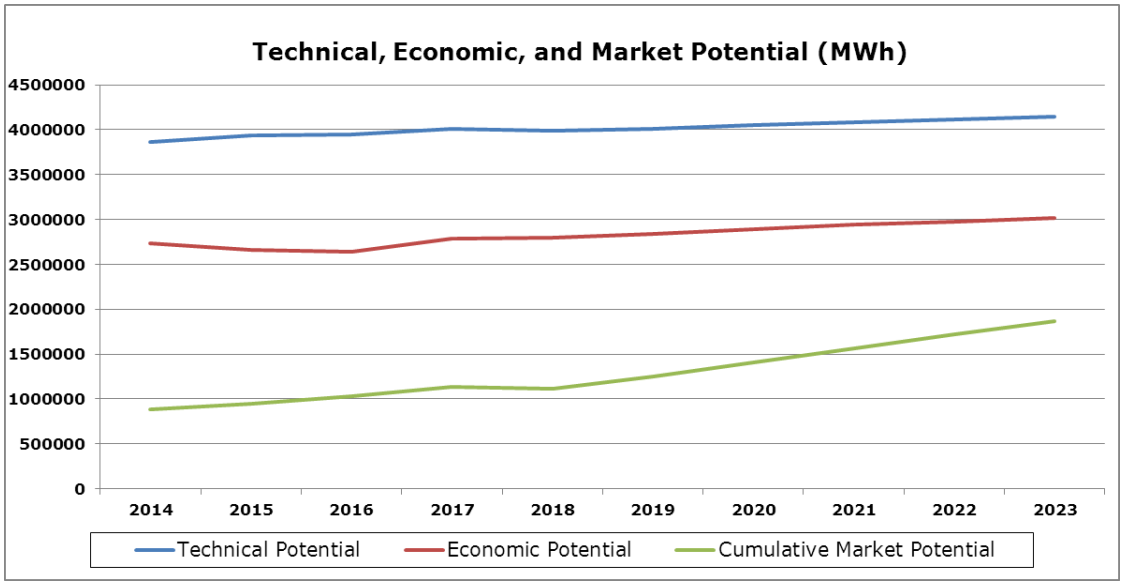
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	413	504	563	645	734	832	928	1,018	1,095	1,153
Commercial	788	785	767	747	691	676	664	654	645	623
Industrial & Agriculture	334	330	315	299	279	257	234	214	196	180
Total All Buildings	**1,536**	**1,619**	**1,644**	**1,690**	**1,705**	**1,764**	**1,826**	**1,886**	**1,936**	**1,955**
% of Forecast Sales	**0.40%**	**0.41%**	**0.41%**	**0.41%**	**0.40%**	**0.41%**	**0.41%**	**0.43%**	**0.44%**	**0.44%**
Utility Re-Participation	398	123	69	75	129	237	121	330	575	834
Total All Buildings (includes Re-participation)	**1,934**	**1,741**	**1,713**	**1,765**	**1,834**	**2,001**	**1,946**	**2,216**	**2,511**	**2,789**
% of Sales with Re-Participation	**0.50%**	**0.44%**	**0.42%**	**0.43%**	**0.43%**	**0.46%**	**0.44%**	**0.50%**	**0.57%**	**0.63%**
Codes & Standards	**1,299**	**1,669**	**2,076**	**2,116**	**2,326**	**2,314**	**2,302**	**2,114**	**1,690**	**1,466**
Incremental & Codes and Standard Effects as % of Forecast	**0.84%**	**0.87%**	**0.94%**	**0.94%**	**0.98%**	**0.99%**	**0.96%**	**0.98%**	**0.95%**	**0.96%**

SACRAMENTO MUNICIPAL UTILITY DISTRICT



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Preliminary Target (MWh)	**151,534**	**148,703**	**160,063**	**175,936**	**167,620**	**184,253**	**195,745**	**215,432**	**207,313**	**200,738**
Total Energy Use (GWh):	11,186.98	11,369.52	11,558.71	11,741.28	11,907.58	12,096.24	12,276.32	12,462.75	12,656.95	12,854.17
Residential Sector Energy Use (GWH):	4,916.98	5,005.84	5,116.85	5,230.75	5,334.06	5,457.92	5,571.74	5,691.84	5,817.06	5,945.03
Commercial Sector Energy Use (GWH):	4,446.69	4,530.05	4,605.33	4,672.07	4,730.65	4,789.73	4,850.33	4,910.43	4,973.80	5,037.98
Industrial Sector Energy Use (GWH):	890.88	890.46	884.41	878.07	874.19	871.59	868.72	865.89	862.43	858.98
Target as Percent of Total	***1.35%***	***1.31%***	***1.38%***	***1.50%***	***1.41%***	***1.52%***	***1.59%***	***1.73%***	***1.64%***	***1.56%***
Electric Demand										
Preliminary Target (MW)	**43.45**	**42.21**	**45.02**	**53.31**	**62.18**	**59.24**	**64.63**	**151.50**	**67.84**	**70.11**
Total Demand (MW):	2,937.03	2,980.54	3,026.46	3,072.38	3,116.28	3,160.28	3,202.93	3,247.16	3,294.81	3,343.16
Residential Demand (MW):	1,731.92	1,756.90	1,786.75	1,818.71	1,849.24	1,879.83	1,908.96	1,939.77	1,973.21	2,007.22
Commercial Demand (MW):	961.97	978.20	993.22	1,006.44	1,018.72	1,030.96	1,043.35	1,055.44	1,068.58	1,081.88
Industrial Demand (MW):	147.91	148.99	148.98	148.72	148.81	148.99	149.11	149.32	149.28	149.25
Target as Percent of Total	***1.48%***	***1.42%***	***1.49%***	***1.73%***	***2.00%***	***1.87%***	***2.02%***	***4.67%***	***2.06%***	***2.10%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,251,125	2,327,122	2,333,493	2,371,312	2,392,729	2,415,078	2,454,672	2,488,354	2,522,304	2,556,636
Commercial	1,471,742	1,476,420	1,480,306	1,509,142	1,469,808	1,469,907	1,472,085	1,467,684	1,464,890	1,460,989
Industrial & Agriculture	139,468	136,853	133,392	131,270	129,529	129,325	129,080	128,742	128,310	127,879
Total All Buildings	**3,862,335**	**3,940,395**	**3,947,192**	**4,011,724**	**3,992,066**	**4,014,310**	**4,055,836**	**4,084,780**	**4,115,503**	**4,145,504**
% of Forecast Sales	34.53%	34.66%	34.15%	34.17%	33.53%	33.19%	33.04%	32.78%	32.52%	32.25%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,306,447	1,253,231	1,226,345	1,250,497	1,180,684	1,203,239	1,227,057	1,249,540	1,272,462	1,295,009
Commercial	671,706	692,436	724,879	726,747	715,217	712,075	709,512	705,091	701,186	696,942
Industrial & Agricultural	25,259	25,026	24,638	24,369	24,170	24,132	24,086	24,023	23,943	23,862
Total All Buildings	**2,003,412**	**1,970,694**	**1,975,861**	**2,001,613**	**1,920,071**	**1,939,446**	**1,960,656**	**1,978,654**	**1,997,590**	**2,015,813**
% of Forecast Sales	68.21%	66.12%	65.29%	65.15%	61.61%	61.37%	61.21%	60.93%	60.63%	60.30%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,618,765	1,557,338	1,552,128	1,682,342	1,722,115	1,760,883	1,795,145	1,822,679	1,850,835	1,896,551
Commercial	996,620	980,738	965,038	986,152	960,665	965,196	974,240	1,001,379	1,003,404	1,004,511
Industrial & Agriculture	118,653	118,782	118,160	117,495	117,157	116,990	116,785	116,488	116,105	115,722
Total All Buildings	**2,734,039**	**2,656,858**	**2,635,325**	**2,785,989**	**2,799,937**	**2,843,069**	**2,886,171**	**2,940,546**	**2,970,344**	**3,016,785**
% of Forecast Sales	24.44%	23.37%	22.80%	23.73%	23.51%	23.50%	23.51%	23.59%	23.47%	23.47%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	936,533	840,078	807,892	910,735	863,083	875,317	890,643	902,637	914,783	928,080
Commercial	552,989	570,713	600,335	600,599	591,831	589,459	588,107	588,038	585,334	582,362
Industrial & Agriculture	22,141	22,165	22,049	21,925	21,862	21,830	21,792	21,737	21,665	21,594
Total All Buildings	**1,511,662**	**1,432,956**	**1,430,276**	**1,533,259**	**1,476,776**	**1,486,606**	**1,500,541**	**1,512,412**	**1,521,781**	**1,532,036**
% of Forecast Sales	51.47%	48.08%	47.26%	49.90%	47.39%	47.04%	46.85%	46.58%	46.19%	45.83%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	385,378	419,729	471,007	528,060	502,799	586,254	691,171	797,632	900,516	996,375
Commercial	386,588	412,061	434,095	467,663	471,393	518,733	568,500	619,339	669,321	717,460
Industrial & Agriculture	107,160	118,565	128,321	135,595	140,975	145,043	147,201	147,374	147,906	147,872
Total All Buildings	**879,126**	**950,356**	**1,033,422**	**1,131,318**	**1,115,167**	**1,250,030**	**1,406,872**	**1,564,345**	**1,717,743**	**1,861,707**
% of Forecast Sales	7.86%	8.36%	8.94%	9.64%	9.37%	10.33%	11.46%	12.55%	13.57%	14.48%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	130,752	143,570	166,690	198,243	223,861	263,626	306,061	348,624	389,345	426,622
Commercial	212,837	218,954	228,711	241,269	246,959	263,284	280,431	283,256	300,758	317,067
Industrial & Agriculture	19,996	22,124	23,945	25,302	26,306	27,065	27,468	27,500	27,599	27,593
Total All Buildings	**363,586**	**384,649**	**419,346**	**464,814**	**497,126**	**553,976**	**613,959**	**659,380**	**717,702**	**771,281**
% of Forecast Sales	12.38%	12.91%	13.86%	15.13%	15.95%	17.53%	19.17%	20.31%	21.78%	23.07%

Incremental Market Potential

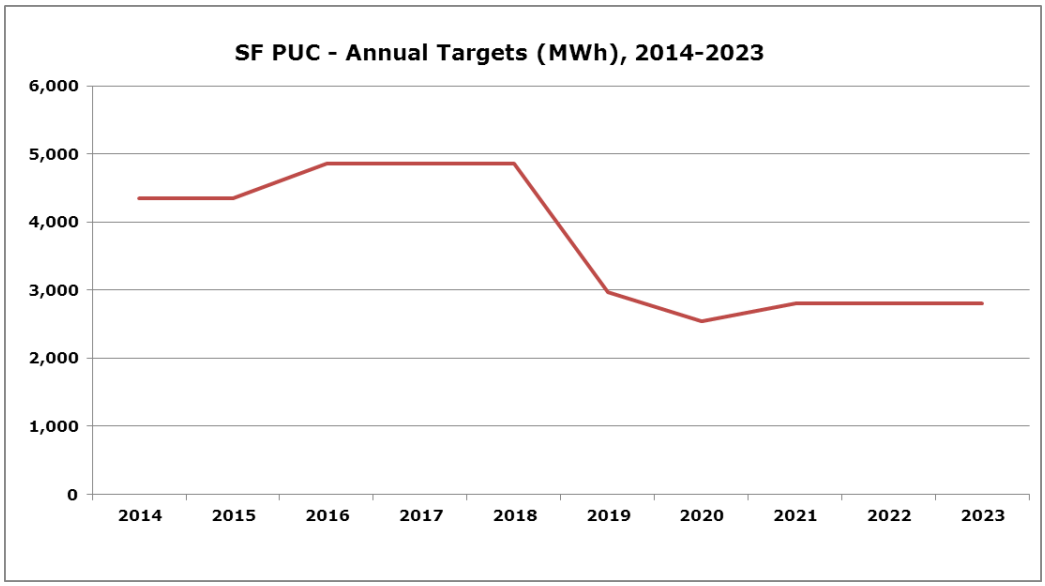
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	66,727	67,961	79,160	94,738	105,750	115,275	121,407	122,679	118,922	111,708
Commercial	43,756	40,091	36,569	37,907	38,681	40,455	41,251	40,723	38,456	35,070
Industrial & Agriculture	12,559	11,643	10,066	8,353	6,650	5,204	4,309	3,640	2,439	1,807
Total All Buildings	**123,043**	**119,695**	**125,796**	**140,997**	**151,082**	**160,933**	**166,966**	**167,042**	**159,818**	**148,585**
% of Forecast Sales	**1.10%**	**1.05%**	**1.09%**	**1.20%**	**1.27%**	**1.33%**	**1.36%**	**1.34%**	**1.26%**	**1.16%**
Utility Re-Participation	28,491	29,008	34,267	34,939	16,539	23,320	28,779	48,390	47,495	52,153
Total All Buildings (includes Re-participation)	**151,534**	**148,703**	**160,063**	**175,936**	**167,620**	**184,253**	**195,745**	**215,432**	**207,313**	**200,738**
% of Sales with Re-Participation	**1.35%**	**1.31%**	**1.38%**	**1.50%**	**1.41%**	**1.52%**	**1.59%**	**1.73%**	**1.64%**	**1.56%**
Codes & Standards	**22,124**	**30,179**	**35,021**	**34,741**	**38,158**	**39,183**	**38,888**	**37,061**	**33,039**	**28,973**
Incremental & Codes and Standard Effects as % of Forecast	**1.55%**	**1.57%**	**1.69%**	**1.79%**	**1.73%**	**1.85%**	**1.91%**	**2.03%**	**1.90%**	**1.79%**

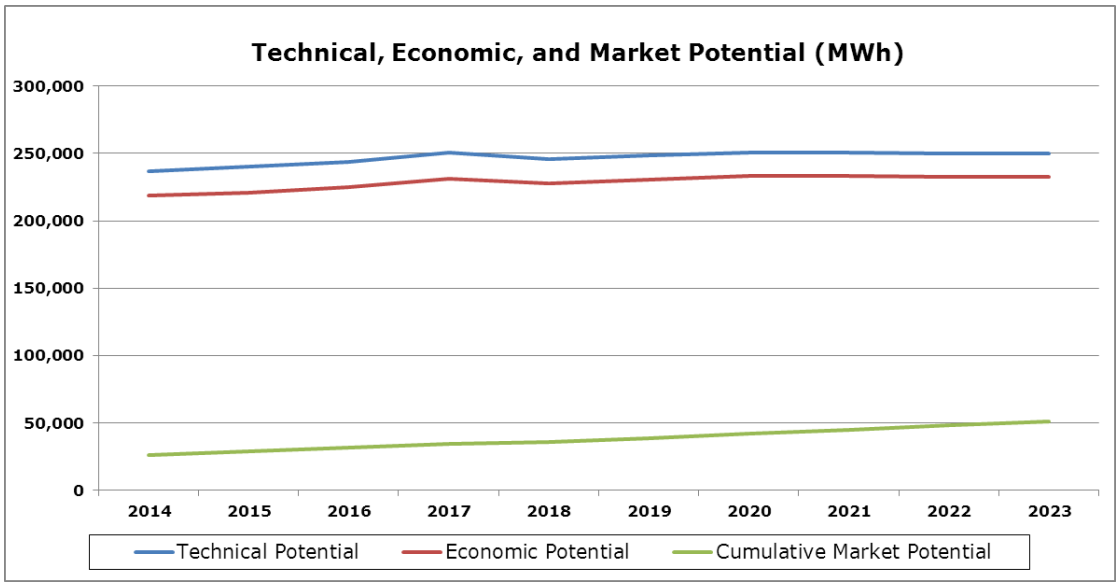
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	22,510	23,558	26,753	34,341	37,267	40,683	42,856	43,138	41,571	38,493
Commercial	14,282	13,311	12,644	13,215	13,761	14,426	14,802	14,795	14,355	13,611
Industrial & Agriculture	2,344	2,173	1,878	1,559	1,241	971	804	679	455	337
Total All Buildings	**39,136**	**39,041**	**41,276**	**49,114**	**52,269**	**56,080**	**58,462**	**58,612**	**56,382**	**52,441**
% of Forecast Sales	**1.33%**	**1.31%**	**1.36%**	**1.60%**	**1.68%**	**1.77%**	**1.83%**	**1.81%**	**1.71%**	**1.57%**
Utility Re-Participation	4,313	3,171	3,742	4,191	9,916	3,163	6,165	92,890	11,455	17,666
Total All Buildings (includes Re-participation)	**43,449**	**42,212**	**45,018**	**53,305**	**62,185**	**59,244**	**64,628**	**151,501**	**67,837**	**70,107**
% of Sales with Re-Participation	**1.48%**	**1.42%**	**1.49%**	**1.73%**	**2.00%**	**1.87%**	**2.02%**	**4.67%**	**2.06%**	**2.10%**
Codes & Standards	**21,718**	**24,253**	**28,832**	**28,857**	**38,601**	**38,661**	**38,126**	**34,780**	**28,918**	**23,035**
Incremental & Codes and Standard Effects as % of Forecast	**2.22%**	**2.23%**	**2.44%**	**2.67%**	**3.23%**	**3.10%**	**3.21%**	**5.74%**	**2.94%**	**2.79%**

SAN FRANCISCO PUBLIC UTILITIES COMMISSION



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**4,353**	**4,353**	**4,857**	**4,857**	**4,857**	**2,970**	**2,536**	**2,806**	**2,806**	**2,806**
Total Energy Use (GWh):	983.18	1,000.39	1,011.06	1,027.36	1,051.94	1,066.28	1,079.87	1,096.95	1,104.79	1,124.98
Residential Sector Energy Use (GWH):	29.96	34.08	39.07	46.74	59.99	63.40	65.11	69.16	69.02	76.32
Commercial Sector Energy Use (GWH):	804.63	810.47	814.24	817.66	823.27	828.38	832.12	838.07	839.76	844.05
Industrial Sector Energy Use (GWH):	148.6	155.8	157.8	163.0	168.7	174.5	182.6	189.7	196.0	204.6
Target as Percent of Total	***0.40%***	***0.39%***	***0.38%***	***0.36%***	***0.32%***	***0.31%***	***0.31%***	***0.30%***	***0.29%***	***0.28%***
Electric Demand										
Adopted Target (MW)	**0.83**	**0.82**	**0.78**	**0.73**	**0.66**	**0.63**	**0.62**	**0.60**	**0.59**	**0.57**
Total Demand (MW):	143.2	145.5	147.1	150.3	153.1	157.3	159.7	161.5	163.7	171.5
Target as Percent of Total	***0.58%***	***0.56%***	***0.53%***	***0.49%***	***0.43%***	***0.40%***	***0.39%***	***0.37%***	***0.36%***	***0.33%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,398	5,825	6,751	8,177	9,558	10,126	10,502	11,121	11,079	12,208
Commercial	231,424	234,429	236,737	242,604	236,051	238,131	240,129	239,715	238,810	237,985
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**236,822**	**240,254**	**243,488**	**250,781**	**245,609**	**248,257**	**250,630**	**250,836**	**249,889**	**250,193**
% of Forecast Sales	24.09%	24.02%	24.08%	24.41%	23.35%	23.28%	23.21%	22.87%	22.62%	22.24%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	675	641	657	740	773	816	831	866	865	928
Commercial	56,008	56,636	57,078	58,382	57,277	57,899	58,509	58,496	58,388	58,276
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**56,683**	**57,277**	**57,735**	**59,122**	**58,051**	**58,715**	**59,340**	**59,362**	**59,252**	**59,205**
% of Forecast Sales	39.58%	39.36%	39.26%	39.33%	37.92%	37.32%	37.15%	36.75%	36.19%	34.53%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,073	5,507	6,437	7,846	9,016	9,751	10,120	10,728	10,686	11,795
Commercial	213,389	215,002	218,342	223,191	218,552	220,844	222,935	222,602	221,800	221,064
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**218,462**	**220,510**	**224,779**	**231,037**	**227,568**	**230,595**	**233,055**	**233,331**	**232,486**	**232,859**
% of Forecast Sales	22.22%	22.04%	22.23%	22.49%	21.63%	21.63%	21.58%	21.27%	21.04%	20.70%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	355	364	418	502	532	572	586	619	616	677
Commercial	46,143	46,580	47,386	48,530	47,910	48,617	49,284	49,326	49,275	49,219
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**46,498**	**46,943**	**47,804**	**49,032**	**48,442**	**49,189**	**49,869**	**49,944**	**49,891**	**49,896**
% of Forecast Sales	32.46%	32.26%	32.50%	32.62%	31.65%	31.27%	31.22%	30.92%	30.47%	29.10%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	624	842	1,098	1,327	1,355	1,631	1,972	2,330	2,708	3,095
Commercial	25,759	28,310	30,617	33,387	34,367	37,255	40,093	42,848	45,430	47,898
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**26,383**	**29,153**	**31,715**	**34,714**	**35,722**	**38,886**	**42,065**	**45,178**	**48,138**	**50,993**
% of Forecast Sales	2.68%	2.91%	3.14%	3.38%	3.40%	3.65%	3.90%	4.12%	4.36%	4.53%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	57	73	93	107	99	120	142	165	189	213
Commercial	6,287	6,843	7,334	7,917	8,127	8,727	9,305	9,859	10,369	10,861
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**6,344**	**6,917**	**7,426**	**8,024**	**8,226**	**8,847**	**9,447**	**10,024**	**10,557**	**11,074**
% of Forecast Sales	4.43%	4.75%	5.05%	5.34%	5.37%	5.62%	5.91%	6.21%	6.45%	6.46%

Incremental Market Potential

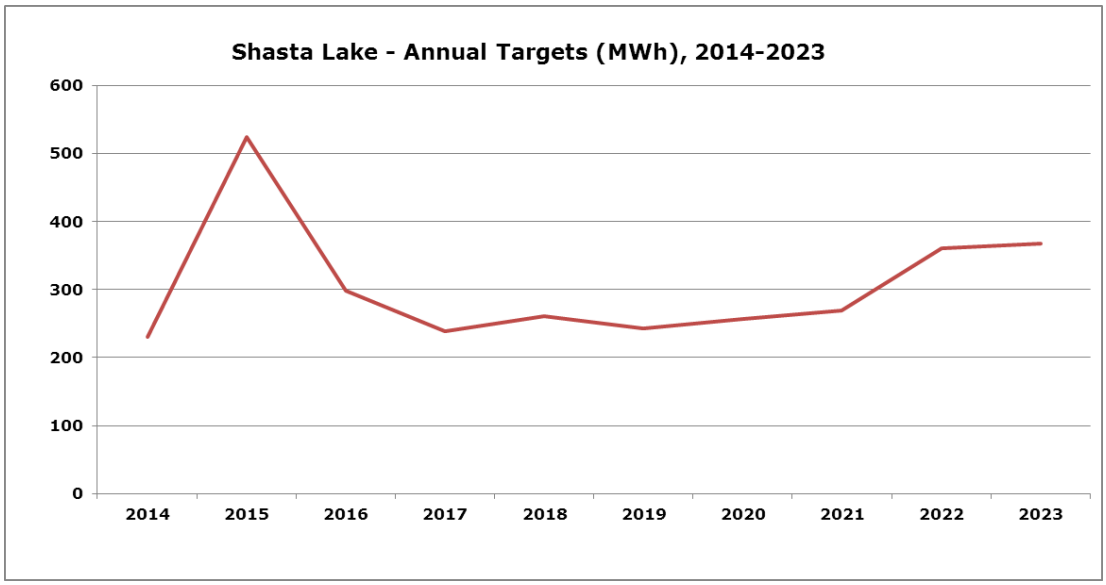
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	213	234	261	297	309	360	383	402	425	434
Commercial	3,721	3,680	3,555	3,372	3,082	2,980	2,915	2,858	2,810	2,706
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**3,934**	**3,914**	**3,816**	**3,669**	**3,391**	**3,340**	**3,299**	**3,260**	**3,235**	**3,139**
% of Forecast Sales	**0.40%**	**0.39%**	**0.38%**	**0.36%**	**0.32%**	**0.31%**	**0.31%**	**0.30%**	**0.29%**	**0.28%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**3,934**	**3,914**	**3,816**	**3,669**	**3,391**	**3,340**	**3,299**	**3,260**	**3,235**	**3,139**
% of Sales with Re-Participation	**0.40%**	**0.39%**	**0.38%**	**0.36%**	**0.32%**	**0.31%**	**0.31%**	**0.30%**	**0.29%**	**0.28%**
Codes & Standards	**778**	**1,328**	**1,845**	**2,012**	**2,536**	**2,541**	**2,525**	**2,522**	**2,233**	**2,190**
Incremental & Codes and Standard Effects as % of Forecast	**0.48%**	**0.52%**	**0.56%**	**0.55%**	**0.56%**	**0.55%**	**0.54%**	**0.53%**	**0.49%**	**0.47%**

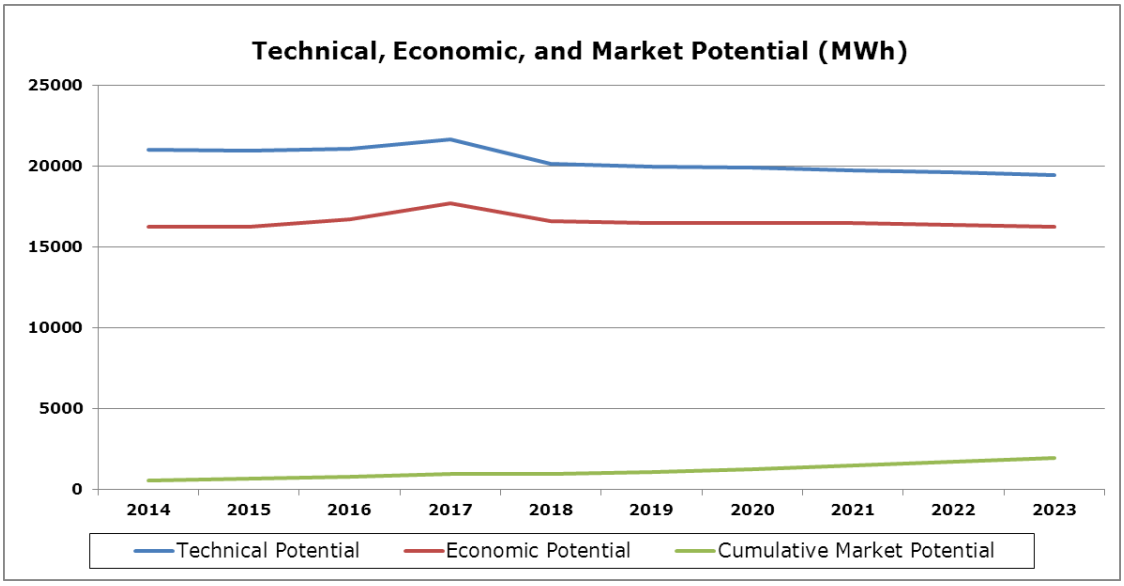
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	17	18	20	23	23	26	27	28	29	29
Commercial	816	800	759	707	638	608	589	575	565	542
Industrial	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**833**	**818**	**779**	**730**	**660**	**633**	**616**	**603**	**594**	**571**
% of Forecast Sales	**0.58%**	**0.56%**	**0.53%**	**0.49%**	**0.43%**	**0.40%**	**0.39%**	**0.37%**	**0.36%**	**0.33%**
Utility Re-Participation	0	0	0	0	0	0	0	0	0	0
Total All Buildings (includes Re-participation)	**833**	**818**	**779**	**730**	**660**	**633**	**616**	**603**	**594**	**571**
% of Sales with Re-Participation	**0.58%**	**0.56%**	**0.53%**	**0.49%**	**0.43%**	**0.40%**	**0.39%**	**0.37%**	**0.36%**	**0.33%**
Codes & Standards	**150**	**279**	**403**	**440**	**541**	**538**	**535**	**532**	**485**	**475**
Incremental & Codes and Standard Effects as % of Forecast	**0.69%**	**0.75%**	**0.80%**	**0.78%**	**0.78%**	**0.74%**	**0.72%**	**0.70%**	**0.66%**	**0.61%**

CITY OF SHASTA LAKE



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**230**	**524**	**299**	**239**	**261**	**243**	**256**	**269**	**361**	**368**
Total Energy Use (GWh):	185.00	185.00	185.00	185.00	185.00	185.00	185.00	185.00	185.00	185.00
Residential Sector Energy Use (GWH):	103.07	103.07	103.07	103.07	103.07	103.07	103.07	103.07	103.07	103.07
Commercial Sector Energy Use (GWH):	81.93	81.93	81.93	81.93	81.93	81.93	81.93	81.93	81.93	81.93
Industrial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.06%***	***0.07%***	***0.08%***	***0.11%***	***0.10%***	***0.11%***	***0.12%***	***0.13%***	***0.15%***	***0.16%***
Electric Demand										
Adopted Target (MW)	**0.07**	**0.14**	**0.09**	**0.07**	**0.09**	**0.09**	**0.10**	**0.11**	**0.15**	**0.16**
Total Demand (MW):	31.60	31.60	31.60	31.60	31.60	31.60	31.60	31.60	31.60	31.60
Residential Demand (MW):	19.53	19.53	19.53	19.53	19.53	19.53	19.53	19.53	19.53	19.53
Commercial Demand (MW):	12.07	12.07	12.07	12.07	12.07	12.07	12.07	12.07	12.07	12.07
Industrial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.22%***	***0.46%***	***0.28%***	***0.22%***	***0.27%***	***0.29%***	***0.32%***	***0.35%***	***0.46%***	***0.49%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	11,456	11,012	10,788	10,820	9,718	9,570	9,578	9,525	9,471	9,419
Commercial	9,551	9,942	10,294	10,818	10,433	10,369	10,310	10,206	10,109	10,003
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**21,007**	**20,953**	**21,081**	**21,638**	**20,151**	**19,939**	**19,889**	**19,731**	**19,580**	**19,422**
% of Forecast Sales	11.36%	11.33%	11.40%	11.70%	10.89%	10.78%	10.75%	10.67%	10.58%	10.50%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,520	4,976	4,614	4,628	4,531	4,539	4,547	4,536	4,526	4,516
Commercial	2,072	2,124	2,180	2,286	2,207	2,198	2,191	2,170	2,151	2,130
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**7,592**	**7,099**	**6,794**	**6,914**	**6,737**	**6,737**	**6,737**	**6,706**	**6,678**	**6,647**
% of Forecast Sales	24.03%	22.47%	21.50%	21.88%	21.32%	21.32%	21.32%	21.22%	21.13%	21.03%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,615	7,196	7,239	7,738	6,963	6,930	6,931	7,063	7,023	6,983
Commercial	8,606	9,049	9,466	9,958	9,616	9,561	9,511	9,415	9,333	9,236
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**16,221**	**16,246**	**16,706**	**17,696**	**16,578**	**16,490**	**16,441**	**16,477**	**16,356**	**16,219**
% of Forecast Sales	8.77%	8.78%	9.03%	9.57%	8.96%	8.91%	8.89%	8.91%	8.84%	8.77%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,533	3,133	2,692	2,717	2,837	2,835	2,825	2,830	2,823	2,815
Commercial	1,770	1,849	1,937	2,039	1,968	1,962	1,957	1,939	1,924	1,906
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**5,303**	**4,982**	**4,629**	**4,756**	**4,806**	**4,797**	**4,782**	**4,769**	**4,747**	**4,721**
% of Forecast Sales	16.78%	15.77%	14.65%	15.05%	15.21%	15.18%	15.13%	15.09%	15.02%	14.94%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	391	452	544	693	643	746	907	1,088	1,278	1,478
Commercial	187	214	243	275	301	334	369	404	430	461
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**578**	**666**	**788**	**968**	**944**	**1,081**	**1,276**	**1,492**	**1,708**	**1,940**
% of Forecast Sales	0.31%	0.36%	0.43%	0.52%	0.51%	0.58%	0.69%	0.81%	0.92%	1.05%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	151	147	183	238	284	358	439	530	623	722
Commercial	34	38	43	49	54	60	67	73	79	85
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**185**	**185**	**226**	**286**	**338**	**418**	**506**	**603**	**702**	**806**
% of Forecast Sales	0.58%	0.58%	0.72%	0.91%	1.07%	1.32%	1.60%	1.91%	2.22%	2.55%

Incremental Market Potential

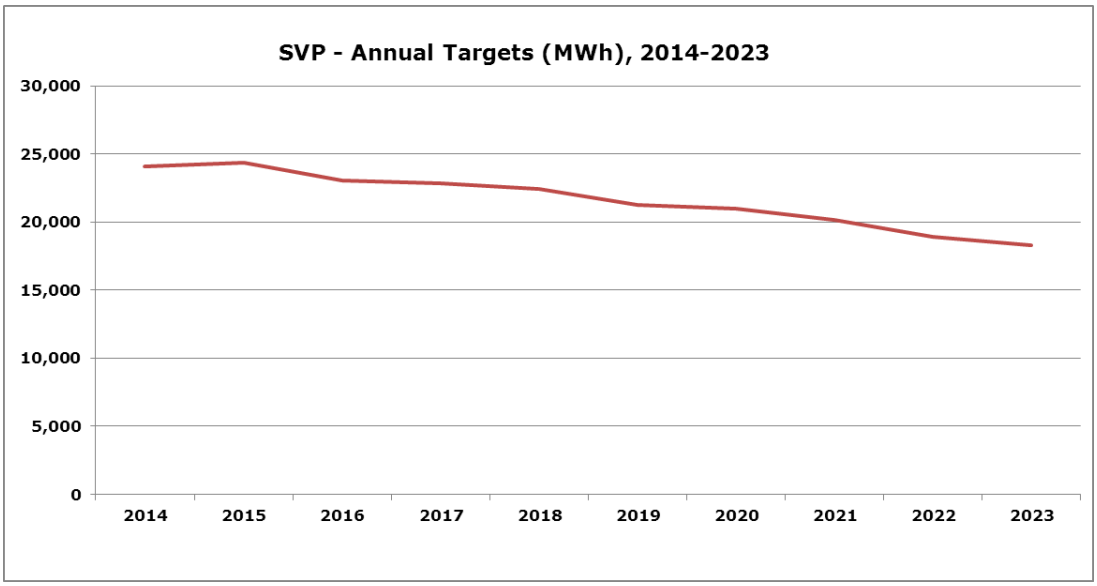
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	89	103	121	162	140	154	171	191	205	217
Commercial	26	29	31	33	33	34	35	36	36	36
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**114**	**132**	**152**	**195**	**173**	**188**	**206**	**227**	**242**	**253**
% of Forecast Sales	**0.06%**	**0.07%**	**0.08%**	**0.11%**	**0.09%**	**0.10%**	**0.11%**	**0.12%**	**0.13%**	**0.14%**
Utility Re-Participation	2	1	2	11	6	6	12	8	43	36
Total All Buildings (includes Re-participation)	**116**	**133**	**154**	**206**	**179**	**195**	**219**	**235**	**284**	**288**
% of Sales with Re-Participation	**0.06%**	**0.07%**	**0.08%**	**0.11%**	**0.10%**	**0.11%**	**0.12%**	**0.13%**	**0.15%**	**0.16%**
Codes & Standards	**158**	**236**	**280**	**277**	**409**	**404**	**388**	**364**	**319**	**264**
Incremental & Codes and Standard Effects as % of Forecast	**0.15%**	**0.20%**	**0.23%**	**0.26%**	**0.32%**	**0.32%**	**0.33%**	**0.32%**	**0.33%**	**0.30%**

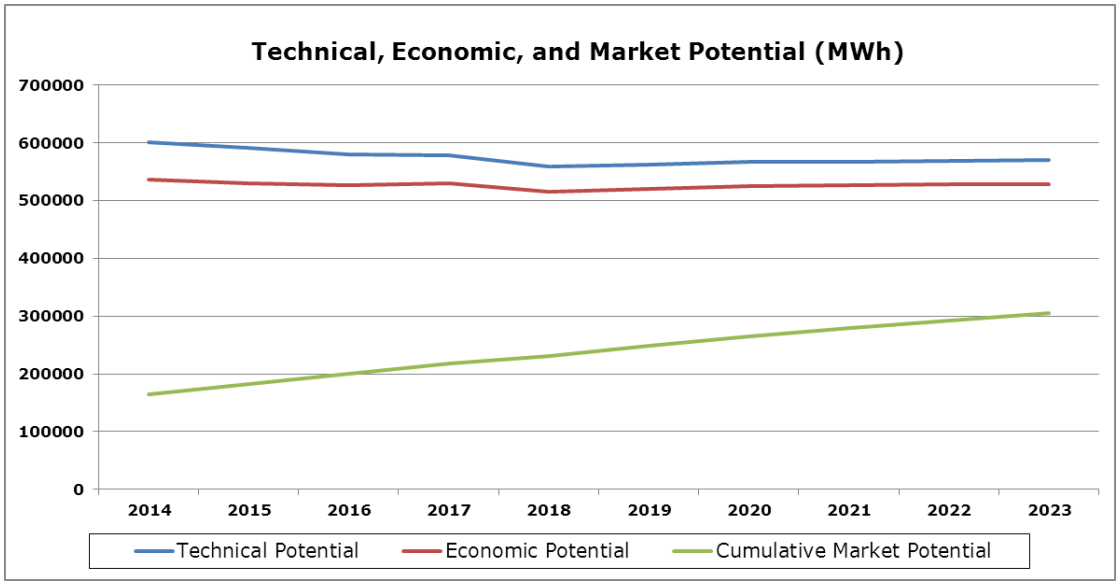
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	40	45	47	56	66	75	83	92	99	105
Commercial	4	5	5	6	6	6	7	7	7	7
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**44**	**50**	**53**	**62**	**72**	**81**	**90**	**98**	**106**	**112**
% of Forecast Sales	**0.14%**	**0.16%**	**0.17%**	**0.20%**	**0.23%**	**0.26%**	**0.28%**	**0.31%**	**0.33%**	**0.35%**
Utility Re-Participation	1	0	0	1	0	1	1	1	13	14
Total All Buildings (includes Re-participation)	**46**	**50**	**53**	**63**	**72**	**81**	**91**	**99**	**119**	**126**
% of Sales with Re-Participation	**0.14%**	**0.16%**	**0.17%**	**0.20%**	**0.23%**	**0.26%**	**0.29%**	**0.31%**	**0.38%**	**0.40%**
Codes & Standards	**86**	**137**	**171**	**172**	**186**	**183**	**181**	**158**	**116**	**92**
Incremental & Codes and Standard Effects as % of Forecast	**0.41%**	**0.59%**	**0.71%**	**0.74%**	**0.82%**	**0.84%**	**0.86%**	**0.81%**	**0.74%**	**0.69%**

SILICON VALLEY POWER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**24,076**	**24,387**	**23,079**	**22,848**	**22,407**	**21,274**	**20,961**	**20,174**	**18,923**	**18,282**
Total Energy Use (GWh):	3,107.26	3,175.59	3,206.24	3,238.30	3,270.69	3,303.39	3,336.43	3,369.79	3,403.49	3,437.52
Residential Sector Energy Use (GWH):	270.25	276.19	278.85	281.64	284.46	287.30	290.18	293.08	296.01	298.97
Commercial Sector Energy Use (GWH):	96.09	98.20	99.15	100.14	101.14	102.15	103.17	104.21	105.25	106.30
Industrial Sector Energy Use (GWH):	2,717.44	2,777.20	2,804.00	2,832.04	2,860.36	2,888.97	2,917.86	2,947.03	2,976.50	3,006.27
Target as Percent of Total	***0.77%***	***0.77%***	***0.72%***	***0.71%***	***0.69%***	***0.64%***	***0.63%***	***0.60%***	***0.56%***	***0.53%***
Electric Demand										
Adopted Target (MW)	**4.76**	**4.87**	**4.69**	**4.61**	**4.49**	**4.27**	**4.17**	**4.05**	**3.85**	**3.73**
Total Demand (MW):	506.30	519.50	524.30	529.50	534.80	540.20	545.60	551.00	556.50	562.10
Residential Demand (MW):	44.03	45.18	45.60	46.05	46.51	46.98	47.45	47.92	48.40	48.89
Commercial Demand (MW):	15.66	16.06	16.21	16.37	16.54	16.70	16.87	17.04	17.21	17.38
Industrial Demand (MW):	442.78	454.33	458.52	463.07	467.71	472.43	477.15	481.87	486.68	491.58
Target as Percent of Total	***0.94%***	***0.94%***	***0.90%***	***0.87%***	***0.84%***	***0.79%***	***0.76%***	***0.73%***	***0.69%***	***0.66%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	54,046	51,494	51,220	51,370	42,961	42,178	42,178	41,844	41,513	41,182
Commercial	251,002	246,506	242,436	242,387	232,146	232,558	233,858	232,101	230,440	228,897
Industrial & Agriculture	295,455	292,890	286,566	285,105	283,586	287,022	290,498	293,686	296,908	300,165
Total All Buildings	**600,503**	**590,889**	**580,222**	**578,861**	**558,693**	**561,758**	**566,535**	**567,630**	**568,861**	**570,243**
% of Forecast Sales	19.33%	18.61%	18.10%	17.88%	17.08%	17.01%	16.98%	16.84%	16.71%	16.59%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	10,861	9,076	8,444	8,427	7,537	7,452	7,442	7,395	7,343	7,291
Commercial	71,400	64,629	63,634	63,651	61,517	61,768	62,282	61,949	61,645	61,373
Industrial & Agricultural	52,492	52,854	52,565	52,742	52,917	53,558	54,207	54,802	55,403	56,011
Total All Buildings	**134,752**	**126,559**	**124,644**	**124,819**	**121,971**	**122,778**	**123,931**	**124,145**	**124,391**	**124,675**
% of Forecast Sales	26.62%	24.36%	23.77%	23.57%	22.81%	22.73%	22.71%	22.53%	22.35%	22.18%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	42,867	45,245	45,298	46,578	37,598	37,572	37,534	37,206	36,880	36,554
Commercial	212,436	207,088	217,636	215,815	207,956	208,623	210,176	208,668	207,255	205,955
Industrial & Agriculture	280,829	277,942	263,958	267,186	270,452	273,757	277,101	280,154	283,241	286,361
Total All Buildings	**536,132**	**530,275**	**526,892**	**529,579**	**516,007**	**519,951**	**524,810**	**526,028**	**527,375**	**528,870**
% of Forecast Sales	17.25%	16.70%	16.43%	16.35%	15.78%	15.74%	15.73%	15.61%	15.50%	15.39%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,279	4,215	3,884	4,040	3,205	3,196	3,152	3,107	3,063	3,019
Commercial	54,778	48,154	52,345	52,041	50,480	50,847	51,476	51,256	51,066	50,905
Industrial & Agriculture	49,763	50,065	49,255	49,857	50,466	51,083	51,707	52,277	52,853	53,435
Total All Buildings	**108,820**	**102,434**	**105,484**	**105,939**	**104,151**	**105,126**	**106,335**	**106,640**	**106,982**	**107,359**
% of Forecast Sales	21.49%	19.72%	20.12%	20.01%	19.47%	19.46%	19.49%	19.35%	19.22%	19.10%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	3,973	3,380	3,656	4,009	3,299	3,512	3,878	4,243	4,607	4,944
Commercial	52,722	57,188	61,596	66,765	68,490	73,827	78,959	83,728	88,376	92,456
Industrial & Agriculture	108,082	121,815	134,771	147,948	159,183	170,972	181,391	190,936	199,589	207,248
Total All Buildings	**164,777**	**182,384**	**200,022**	**218,722**	**230,972**	**248,312**	**264,228**	**278,908**	**292,571**	**304,648**
% of Forecast Sales	5.30%	5.74%	6.24%	6.75%	7.06%	7.52%	7.92%	8.28%	8.60%	8.86%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	492	392	395	419	317	335	363	392	423	452
Commercial	14,685	14,993	16,181	17,535	18,097	19,467	20,825	22,075	23,246	24,261
Industrial & Agriculture	19,430	22,163	24,864	27,465	29,704	31,903	33,848	35,629	37,243	38,672
Total All Buildings	**34,607**	**37,548**	**41,440**	**45,419**	**48,118**	**51,705**	**55,035**	**58,095**	**60,912**	**63,385**
% of Forecast Sales	6.84%	7.23%	7.90%	8.58%	9.00%	9.57%	10.09%	10.54%	10.95%	11.28%

Incremental Market Potential

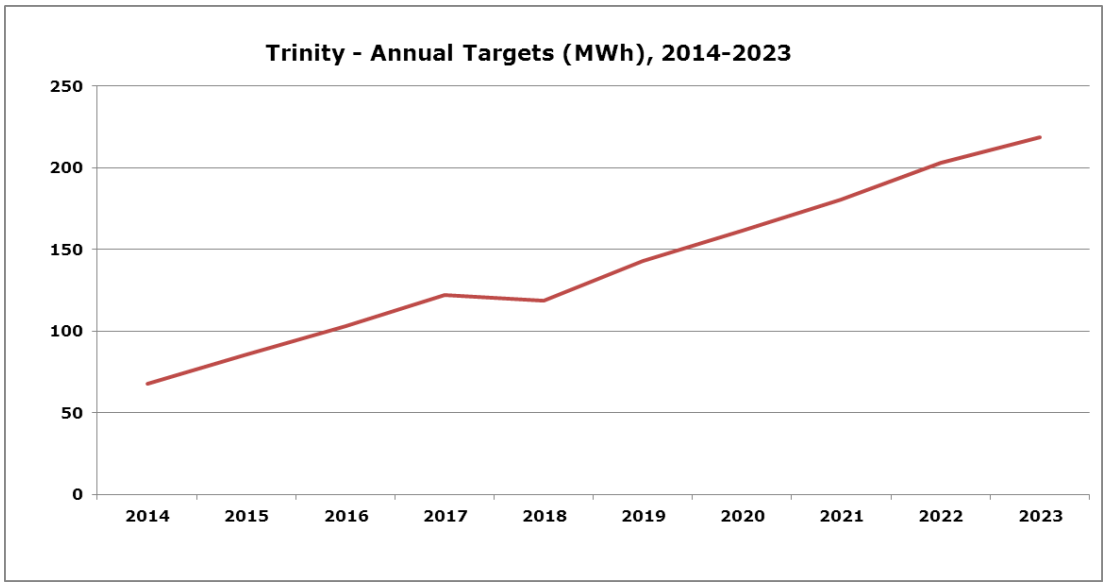
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	350	430	495	594	439	470	503	522	523	503
Commercial	6,579	6,233	6,167	6,007	5,531	5,479	5,477	5,396	5,154	4,809
Industrial & Agriculture	16,794	16,993	16,156	15,418	14,525	13,462	12,498	11,533	10,647	9,855
Total All Buildings	**23,723**	**23,656**	**22,818**	**22,019**	**20,495**	**19,411**	**18,477**	**17,450**	**16,323**	**15,167**
% of Forecast Sales	**0.76%**	**0.74%**	**0.71%**	**0.68%**	**0.63%**	**0.59%**	**0.55%**	**0.52%**	**0.48%**	**0.44%**
Utility Re-Participation	352	731	261	829	1,912	1,863	2,484	2,724	2,600	3,115
Total All Buildings (includes Re-participation)	**24,076**	**24,387**	**23,079**	**22,848**	**22,407**	**21,274**	**20,961**	**20,174**	**18,923**	**18,282**
% of Sales with Re-Participation	**0.77%**	**0.77%**	**0.72%**	**0.71%**	**0.69%**	**0.64%**	**0.63%**	**0.60%**	**0.56%**	**0.53%**
Codes & Standards	**2,324**	**2,705**	**3,302**	**3,387**	**4,700**	**4,669**	**4,568**	**4,432**	**3,896**	**3,516**
Incremental & Codes and Standard Effects as % of Forecast	**0.84%**	**0.83%**	**0.81%**	**0.78%**	**0.77%**	**0.73%**	**0.69%**	**0.65%**	**0.59%**	**0.54%**

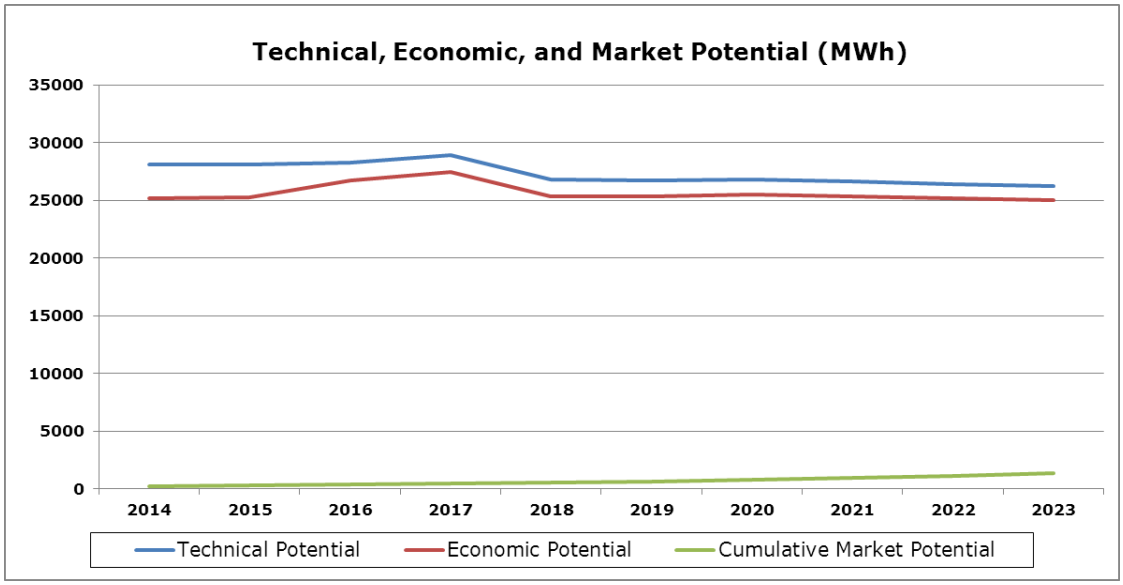
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	39	47	47	58	40	43	47	49	51	50
Commercial	1,673	1,591	1,583	1,527	1,405	1,382	1,376	1,355	1,297	1,212
Industrial & Agriculture	2,984	3,095	3,015	2,877	2,710	2,512	2,332	2,152	1,987	1,839
Total All Buildings	**4,696**	**4,733**	**4,645**	**4,462**	**4,155**	**3,938**	**3,755**	**3,557**	**3,334**	**3,101**
% of Forecast Sales	**0.93%**	**0.91%**	**0.89%**	**0.84%**	**0.78%**	**0.73%**	**0.69%**	**0.65%**	**0.60%**	**0.55%**
Utility Re-Participation	60	137	48	145	340	330	411	489	512	634
Total All Buildings (includes Re-participation)	**4,756**	**4,871**	**4,693**	**4,606**	**4,495**	**4,268**	**4,166**	**4,045**	**3,846**	**3,734**
% of Sales with Re-Participation	**0.94%**	**0.94%**	**0.90%**	**0.87%**	**0.84%**	**0.79%**	**0.76%**	**0.73%**	**0.69%**	**0.66%**
Codes & Standards	**3,011**	**856**	**1,051**	**1,079**	**1,279**	**1,270**	**1,254**	**1,160**	**927**	**792**
Incremental & Codes and Standard Effects as % of Forecast	**1.52%**	**1.08%**	**1.09%**	**1.05%**	**1.02%**	**0.96%**	**0.92%**	**0.86%**	**0.77%**	**0.69%**

TRINITY PUBLIC UTILITY DISTRICT



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**68**	**86**	**103**	**122**	**118**	**143**	**161**	**180**	**203**	**219**
Total Energy Use (GWh):	94.61	95.55	96.51	97.48	98.45	99.43	100.43	101.43	102.45	103.47
Residential Sector Energy Use (GWH):	57.52	58.10	58.68	59.27	59.86	60.46	61.06	61.67	62.29	62.91
Commercial Sector Energy Use (GWH):	37.09	37.46	37.83	38.21	38.59	38.98	39.37	39.76	40.16	40.56
Industrial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.07%***	***0.09%***	***0.11%***	***0.13%***	***0.12%***	***0.14%***	***0.16%***	***0.18%***	***0.20%***	***0.21%***
Electric Demand										
Adopted Target (MW)	**0.02**	**0.02**	**0.02**	**0.03**	**0.03**	**0.03**	**0.04**	**0.04**	**0.05**	**0.05**
Total Demand (MW):	20.18	20.38	20.58	20.79	21.00	21.21	21.42	21.63	21.85	22.07
Residential Demand (MW):	12.27	19.36	19.55	19.74	19.94	20.14	20.34	20.55	20.75	20.96
Commercial Demand (MW):	7.91	16.71	16.87	17.04	17.21	17.38	17.56	17.73	17.91	18.09
Industrial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.09%***	***0.11%***	***0.12%***	***0.14%***	***0.14%***	***0.16%***	***0.17%***	***0.19%***	***0.21%***	***0.23%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	13,081	12,893	12,895	13,124	11,681	11,590	11,724	11,678	11,633	11,588
Commercial	15,037	15,210	15,367	15,767	15,136	15,105	15,078	14,931	14,795	14,644
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**28,118**	**28,104**	**28,262**	**28,890**	**26,817**	**26,695**	**26,802**	**26,610**	**26,428**	**26,231**
% of Forecast Sales	29.72%	29.41%	29.28%	29.64%	27.24%	26.85%	26.69%	26.23%	25.80%	25.35%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	6,070	5,678	5,275	5,540	5,651	5,912	6,167	6,307	6,447	6,587
Commercial	3,755	3,680	3,705	3,800	3,692	3,707	3,723	3,692	3,663	3,631
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**9,824**	**9,358**	**8,980**	**9,340**	**9,343**	**9,619**	**9,890**	**9,999**	**10,110**	**10,218**
% of Forecast Sales	48.69%	45.92%	43.63%	44.93%	44.50%	45.36%	46.18%	46.22%	46.27%	46.30%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	11,044	10,928	12,173	12,584	10,975	11,051	11,180	11,195	11,150	11,106
Commercial	14,097	14,285	14,536	14,880	14,334	14,310	14,292	14,164	14,036	13,893
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**25,141**	**25,212**	**26,709**	**27,465**	**25,309**	**25,361**	**25,472**	**25,360**	**25,186**	**24,998**
% of Forecast Sales	26.57%	26.39%	27.67%	28.18%	25.71%	25.51%	25.36%	25.00%	24.58%	24.16%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,265	4,991	4,538	4,894	5,000	5,255	5,504	5,645	5,786	5,926
Commercial	3,217	3,138	3,205	3,294	3,211	3,231	3,252	3,229	3,205	3,177
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**8,481**	**8,129**	**7,743**	**8,188**	**8,211**	**8,486**	**8,756**	**8,874**	**8,991**	**9,104**
% of Forecast Sales	42.03%	39.89%	37.62%	39.38%	39.10%	40.01%	40.88%	41.02%	41.15%	41.25%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	111	157	212	280	277	344	420	505	598	697
Commercial	70	107	151	202	244	307	377	452	531	614
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**181**	**264**	**363**	**482**	**521**	**652**	**797**	**957**	**1,129**	**1,311**
% of Forecast Sales	0.19%	0.28%	0.38%	0.49%	0.53%	0.66%	0.79%	0.94%	1.10%	1.27%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	99	113	125	142	151	169	188	210	233	257
Commercial	15	23	32	44	54	68	84	101	119	139
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**114**	**135**	**158**	**186**	**205**	**237**	**273**	**311**	**352**	**396**
% of Forecast Sales	0.56%	0.66%	0.77%	0.89%	0.98%	1.12%	1.27%	1.44%	1.61%	1.79%

Incremental Market Potential

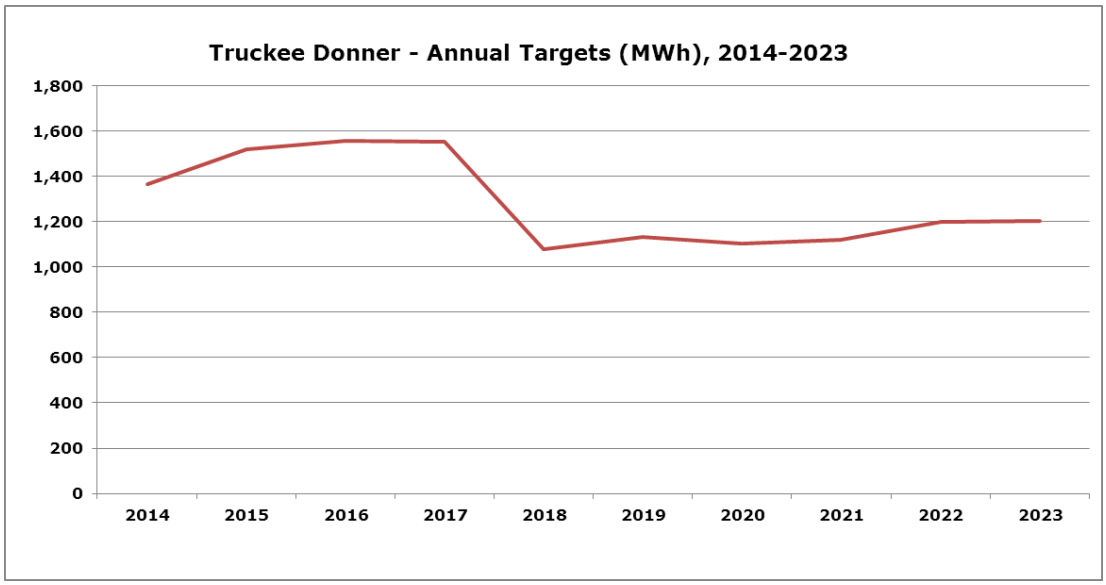
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	36	47	56	68	60	69	78	88	96	104
Commercial	31	39	46	53	57	64	70	76	81	85
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**68**	**85**	**102**	**121**	**117**	**133**	**148**	**164**	**178**	**189**
% of Forecast Sales	**0.07%**	**0.09%**	**0.11%**	**0.12%**	**0.12%**	**0.13%**	**0.15%**	**0.16%**	**0.17%**	**0.18%**
Utility Re-Participation	0	1	1	1	1	10	13	16	25	30
Total All Buildings (includes Re-participation)	**68**	**86**	**103**	**122**	**118**	**143**	**161**	**180**	**203**	**219**
Codes & Standards	**192**	**265**	**314**	**310**	**496**	**497**	**484**	**469**	**435**	**379**
Incremental & Codes and Standard Effects as % of Forecast	**0.27%**	**0.37%**	**0.43%**	**0.44%**	**0.62%**	**0.63%**	**0.63%**	**0.62%**	**0.60%**	**0.55%**

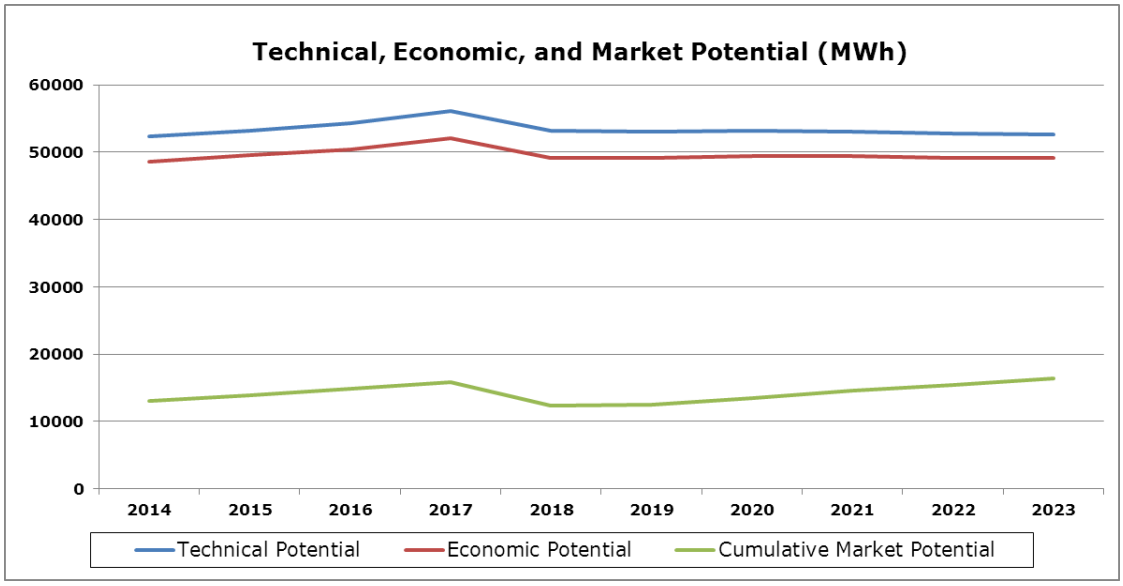
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	12	14	14	17	16	18	20	22	23	25
Commercial	7	8	10	12	13	14	16	17	19	20
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**19**	**22**	**24**	**28**	**29**	**32**	**36**	**39**	**42**	**45**
% of Forecast Sales	**0.09%**	**0.11%**	**0.12%**	**0.14%**	**0.14%**	**0.15%**	**0.17%**	**0.18%**	**0.19%**	**0.20%**
Utility Re-Participation	0	0	0	0	0	1	2	2	5	6
Total All Buildings (includes Re-participation)	**19**	**22**	**24**	**28**	**29**	**34**	**37**	**41**	**47**	**50**
Codes & Standards	**92**	**130**	**201**	**202**	**222**	**220**	**218**	**210**	**192**	**182**
Incremental & Codes and Standard Effects as % of Forecast	**0.55%**	**0.74%**	**1.09%**	**1.11%**	**1.20%**	**1.19%**	**1.19%**	**1.15%**	**1.07%**	**1.03%**

TRUCKEE DONNER PUBLIC UTILITY DISTRICT



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**1,367**	**1,521**	**1,558**	**1,552**	**1,080**	**1,134**	**1,103**	**1,121**	**1,198**	**1,204**
Total Energy Use (GWh):	154.52	156.07	157.63	159.20	160.80	162.40	164.03	165.67	167.33	169.00
Residential Sector Energy Use (GWH):	82.94	83.77	84.61	85.45	86.31	87.17	88.04	88.92	89.81	90.71
Commercial Sector Energy Use (GWH):	71.58	72.30	73.02	73.75	74.49	75.23	75.99	76.75	77.51	78.29
Industrial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.88%***	***0.97%***	***0.99%***	***0.97%***	***0.67%***	***0.70%***	***0.67%***	***0.68%***	***0.72%***	***0.71%***
Electric Demand										
Adopted Target (MW)	**0.19**	**0.21**	**0.21**	**0.21**	**0.19**	**0.19**	**0.20**	**0.20**	**0.22**	**0.22**
Total Demand (MW):	35.70	36.06	36.42	36.79	37.15	37.52	37.90	38.28	38.66	39.05
Residential Demand (MW):	19.16	19.36	19.55	19.74	19.94	20.14	20.34	20.55	20.75	20.96
Commercial Demand (MW):	16.54	16.71	16.87	17.04	17.21	17.38	17.56	17.73	17.91	18.09
Industrial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target as Percent of Total	***0.53%***	***0.57%***	***0.57%***	***0.58%***	***0.51%***	***0.52%***	***0.52%***	***0.53%***	***0.57%***	***0.56%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	13,133	13,097	13,278	13,682	12,150	12,208	12,544	12,750	12,961	13,175
Commercial	39,184	40,153	41,013	42,487	40,968	40,793	40,642	40,227	39,853	39,425
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**52,317**	**53,250**	**54,291**	**56,169**	**53,118**	**53,001**	**53,186**	**52,978**	**52,814**	**52,599**
% of Forecast Sales	33.86%	34.12%	34.44%	35.28%	33.03%	32.63%	32.42%	31.98%	31.56%	31.12%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,934	5,545	5,117	5,452	5,616	5,969	6,329	6,642	6,964	7,297
Commercial	9,142	9,218	9,358	9,673	9,394	9,397	9,405	9,322	9,249	9,162
Industrial & Agricultural	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**15,076**	**14,763**	**14,475**	**15,124**	**15,010**	**15,366**	**15,734**	**15,963**	**16,213**	**16,459**
% of Forecast Sales	42.23%	40.94%	39.74%	41.11%	40.40%	40.95%	41.51%	41.70%	41.94%	42.15%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	12,511	12,515	12,617	13,055	11,298	11,543	11,935	12,323	12,327	12,729
Commercial	36,037	37,067	37,830	39,079	37,787	37,645	37,527	37,145	36,803	36,407
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**48,547**	**49,582**	**50,446**	**52,134**	**49,084**	**49,188**	**49,462**	**49,468**	**49,130**	**49,136**
% of Forecast Sales	31.42%	31.77%	32.00%	32.75%	30.53%	30.29%	30.15%	29.86%	29.36%	29.08%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,092	4,805	4,300	4,692	4,833	5,163	5,498	6,072	6,099	6,704
Commercial	7,790	7,924	8,160	8,441	8,217	8,232	8,252	8,181	8,121	8,045
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**12,882**	**12,729**	**12,460**	**13,133**	**13,050**	**13,395**	**13,751**	**14,253**	**14,220**	**14,750**
% of Forecast Sales	36.08%	35.30%	34.21%	35.70%	35.12%	35.70%	36.28%	37.23%	36.78%	37.77%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	7,825	8,441	9,142	9,901	6,579	6,503	7,148	7,811	8,490	9,180
Commercial	5,165	5,441	5,647	5,939	5,699	6,040	6,379	6,708	6,964	7,225
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**12,990**	**13,881**	**14,789**	**15,840**	**12,278**	**12,543**	**13,527**	**14,518**	**15,454**	**16,405**
% of Forecast Sales	8.41%	8.89%	9.38%	9.95%	7.64%	7.72%	8.25%	8.76%	9.24%	9.71%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	940	978	1,034	1,118	930	1,040	1,153	1,270	1,390	1,514
Commercial	1,128	1,178	1,218	1,280	1,228	1,303	1,377	1,450	1,506	1,565
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**2,068**	**2,156**	**2,252**	**2,398**	**2,158**	**2,342**	**2,530**	**2,720**	**2,896**	**3,079**
% of Forecast Sales	5.79%	5.98%	6.18%	6.52%	5.81%	6.24%	6.68%	7.11%	7.49%	7.89%

Incremental Market Potential

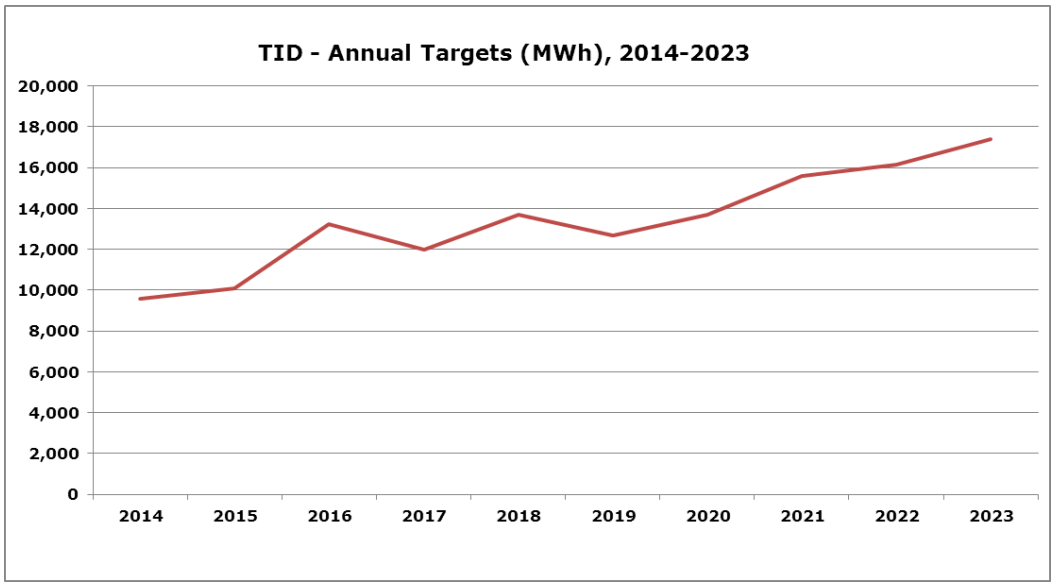
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	746	855	889	935	665	694	716	737	757	776
Commercial	564	518	473	437	382	366	354	347	348	337
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**1,309**	**1,373**	**1,362**	**1,372**	**1,047**	**1,060**	**1,071**	**1,084**	**1,106**	**1,112**
% of Forecast Sales	**0.85%**	**0.88%**	**0.86%**	**0.86%**	**0.65%**	**0.65%**	**0.65%**	**0.65%**	**0.66%**	**0.66%**
Utility Re-Participation	58	148	196	180	32	75	32	37	92	92
Total All Buildings (includes Re-participation)	**1,367**	**1,521**	**1,558**	**1,552**	**1,080**	**1,134**	**1,103**	**1,121**	**1,198**	**1,204**
% of Sales with Re-Participation	**0.88%**	**0.97%**	**0.99%**	**0.97%**	**0.67%**	**0.70%**	**0.67%**	**0.68%**	**0.72%**	**0.71%**
Codes & Standards	**292**	**422**	**523**	**529**	**790**	**798**	**788**	**775**	**703**	**623**
Incremental & Codes and Standard Effects as % of Forecast	**1.07%**	**1.25%**	**1.32%**	**1.31%**	**1.16%**	**1.19%**	**1.15%**	**1.14%**	**1.14%**	**1.08%**

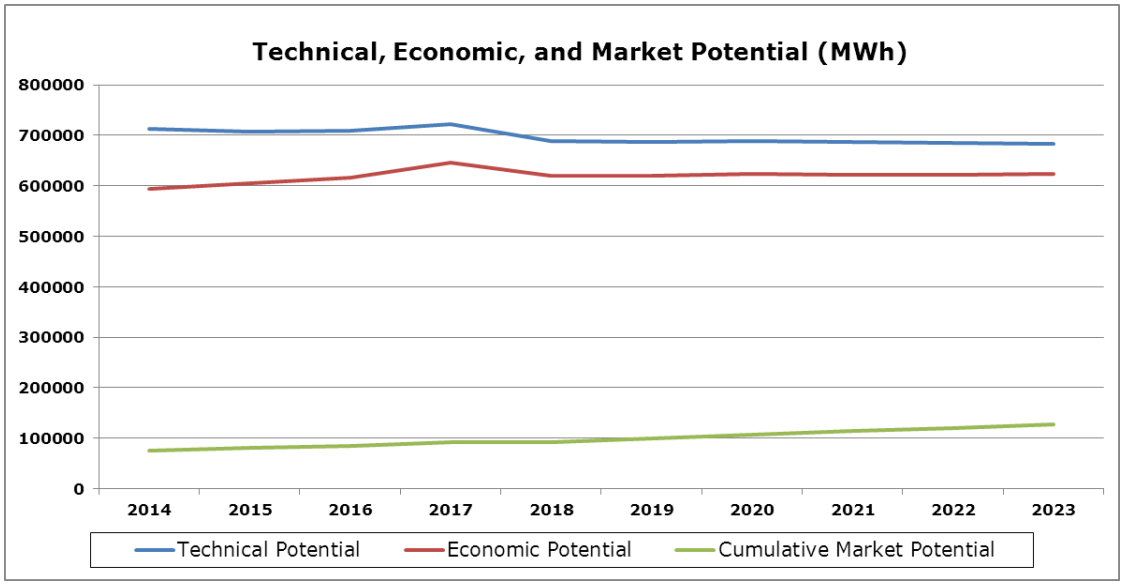
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	71	90	97	106	109	114	118	123	126	130
Commercial	115	105	96	90	80	77	76	76	78	75
Industrial & Agriculture	0	0	0	0	0	0	0	0	0	0
Total All Buildings	**186**	**196**	**193**	**196**	**189**	**192**	**195**	**198**	**204**	**205**
% of Forecast Sales	**0.52%**	**0.54%**	**0.53%**	**0.53%**	**0.51%**	**0.51%**	**0.51%**	**0.52%**	**0.53%**	**0.53%**
Utility Re-Participation	2	10	17	17	1	2	2	3	17	14
Total All Buildings (includes Re-participation)	**188**	**205**	**209**	**213**	**190**	**194**	**196**	**201**	**221**	**219**
% of Sales with Re-Participation	**0.53%**	**0.57%**	**0.57%**	**0.58%**	**0.51%**	**0.52%**	**0.52%**	**0.53%**	**0.57%**	**0.56%**
Codes & Standards	**106**	**170**	**267**	**273**	**310**	**311**	**313**	**306**	**282**	**271**
Incremental & Codes and Standard Effects as % of Forecast	**0.82%**	**1.04%**	**1.31%**	**1.32%**	**1.34%**	**1.35%**	**1.34%**	**1.32%**	**1.30%**	**1.25%**

TURLOCK IRRIGATION DISTRICT



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**9,570**	**10,081**	**13,232**	**11,996**	**13,674**	**12,666**	**13,698**	**15,601**	**16,159**	**17,372**
Total Energy Use (GWh):	2,029.86	2,063.12	2,096.61	2,130.50	2,164.83	2,200.40	2,236.45	2,272.30	2,308.60	2,345.42
Residential Sector Energy Use (GWH):	731.92	744.02	756.02	768.05	780.08	792.83	805.64	818.45	831.34	844.25
Commercial Sector Energy Use (GWH):	585.22	593.00	600.61	608.42	616.10	623.43	630.62	639.27	647.74	656.07
Industrial Sector Energy Use (GWH):	709.37	722.59	736.18	749.94	763.99	778.55	793.45	807.79	822.46	837.55
Target as Percent of Total	***0.47%***	***0.49%***	***0.63%***	***0.56%***	***0.63%***	***0.58%***	***0.61%***	***0.69%***	***0.70%***	***0.74%***
Electric Demand										
Adopted Target (MW)	**2.19**	**2.31**	**2.91**	**2.70**	**2.99**	**2.91**	**3.17**	**3.72**	**4.29**	**4.71**
Total Demand (MW):	502.71	510.82	518.93	527.14	535.43	544.05	552.77	561.47	570.26	579.14
Residential Demand (MW):	248.27	252.38	256.45	260.53	264.61	268.93	273.28	277.63	282.00	286.38
Commercial Demand (MW):	30.49	30.89	31.29	31.70	32.10	32.48	32.85	33.30	33.74	34.18
Industrial Demand (MW):	128.79	131.23	133.73	136.27	138.86	141.54	144.29	146.94	149.64	152.42
Target as Percent of Total	***0.43%***	***0.45%***	***0.56%***	***0.51%***	***0.56%***	***0.54%***	***0.57%***	***0.66%***	***0.75%***	***0.81%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	260,157	247,317	241,366	240,973	218,786	215,409	215,262	214,022	212,772	211,538
Commercial	333,871	341,215	347,813	359,711	347,272	346,109	345,179	341,847	338,858	335,341
Industrial & Agriculture	119,086	119,622	120,157	121,606	123,075	125,581	128,149	130,543	132,993	135,513
Total All Buildings	**713,113**	**708,154**	**709,335**	**722,291**	**689,133**	**687,100**	**688,590**	**686,412**	**684,623**	**682,392**
% of Forecast Sales	35.13%	34.32%	33.83%	33.90%	31.83%	31.23%	30.79%	30.21%	29.66%	29.09%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	133,777	118,107	108,404	108,054	105,743	105,469	105,552	105,392	105,160	104,733
Commercial	76,804	76,008	77,064	79,502	77,201	77,149	77,151	76,496	75,928	75,223
Industrial & Agricultural	21,718	21,979	22,247	22,603	22,966	23,434	23,913	24,359	24,816	25,287
Total All Buildings	**232,298**	**216,095**	**207,714**	**210,158**	**205,910**	**206,051**	**206,616**	**206,247**	**205,904**	**205,242**
% of Forecast Sales	46.21%	42.30%	40.03%	39.87%	38.46%	37.87%	37.38%	36.73%	36.11%	35.44%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	185,637	187,839	187,339	205,985	186,212	184,954	186,905	185,565	184,229	188,257
Commercial	291,077	298,500	311,859	321,707	312,476	311,658	311,079	308,097	305,462	302,284
Industrial & Agriculture	117,272	117,775	116,407	119,109	121,500	123,977	126,514	128,878	131,297	133,786
Total All Buildings	**593,985**	**604,114**	**615,604**	**646,800**	**620,188**	**620,589**	**624,498**	**622,540**	**620,989**	**624,328**
% of Forecast Sales	29.26%	29.28%	29.36%	30.36%	28.65%	28.20%	27.92%	27.40%	26.90%	26.62%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	71,687	71,615	70,622	73,470	71,234	71,061	71,097	70,853	70,611	70,369
Commercial	62,417	61,858	65,439	67,533	65,880	65,942	66,059	65,518	65,064	64,471
Industrial & Agriculture	21,379	21,635	21,721	22,226	22,672	23,134	23,607	24,049	24,500	24,965
Total All Buildings	**155,484**	**155,108**	**157,783**	**163,229**	**159,786**	**160,137**	**160,763**	**160,420**	**160,175**	**159,804**
% of Forecast Sales	30.93%	30.36%	30.41%	30.96%	29.84%	29.43%	29.08%	28.57%	28.09%	27.59%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	5,538	7,341	9,635	12,313	13,681	16,783	19,975	23,249	26,620	30,141
Commercial	39,328	40,825	42,202	44,318	42,948	45,688	48,383	50,858	53,066	54,970
Industrial & Agriculture	30,045	32,209	33,598	35,124	36,400	37,751	38,831	39,700	40,668	41,585
Total All Buildings	**74,912**	**80,374**	**85,436**	**91,755**	**93,028**	**100,222**	**107,189**	**113,807**	**120,354**	**126,696**
% of Forecast Sales	3.69%	3.90%	4.07%	4.31%	4.30%	4.55%	4.79%	5.01%	5.21%	5.40%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	1,565	2,380	3,413	4,740	6,077	7,788	9,701	11,798	13,953	16,218
Commercial	8,536	8,783	9,119	9,585	9,346	9,912	10,465	10,959	11,397	11,762
Industrial & Agriculture	5,451	5,898	6,213	6,526	6,792	7,044	7,246	7,408	7,589	7,760
Total All Buildings	**15,552**	**17,061**	**18,745**	**20,851**	**22,216**	**24,744**	**27,411**	**30,165**	**32,939**	**35,740**
% of Forecast Sales	3.09%	3.34%	3.61%	3.96%	4.15%	4.55%	4.96%	5.37%	5.78%	6.17%

Incremental Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,399	3,334	4,193	5,065	5,667	6,503	7,061	7,389	7,676	7,906
Commercial	3,193	3,151	3,130	3,051	2,822	2,788	2,768	2,754	2,761	2,701
Industrial & Agriculture	3,078	2,806	2,499	2,126	1,844	1,645	1,536	1,401	1,294	1,212
Total All Buildings	**8,669**	**9,292**	**9,822**	**10,242**	**10,332**	**10,937**	**11,365**	**11,543**	**11,730**	**11,819**
% of Forecast Sales	**0.43%**	**0.45%**	**0.47%**	**0.48%**	**0.48%**	**0.50%**	**0.51%**	**0.51%**	**0.51%**	**0.50%**
Utility Re-Participation	900	789	3,411	1,755	3,341	1,729	2,333	4,057	4,429	5,553
Total All Buildings (includes Re-participation)	**9,570**	**10,081**	**13,232**	**11,996**	**13,674**	**12,666**	**13,698**	**15,601**	**16,159**	**17,372**
% of Sales with Re-Participation	**0.47%**	**0.49%**	**0.63%**	**0.56%**	**0.63%**	**0.58%**	**0.61%**	**0.69%**	**0.70%**	**0.74%**
Codes & Standards	**4,341**	**5,977**	**7,026**	**7,007**	**9,715**	**9,747**	**9,550**	**9,063**	**7,847**	**6,593**
Incremental & Codes and Standard Effects as % of Forecast	**0.69%**	**0.78%**	**0.97%**	**0.89%**	**1.08%**	**1.02%**	**1.04%**	**1.09%**	**1.04%**	**1.02%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	766	969	1,167	1,369	1,538	1,736	1,934	2,119	2,284	2,418
Commercial	732	694	683	650	589	572	561	555	559	544
Industrial & Agriculture	558	515	466	397	344	307	287	261	241	226
Total All Buildings	**2,057**	**2,179**	**2,317**	**2,415**	**2,471**	**2,615**	**2,782**	**2,936**	**3,085**	**3,188**
% of Forecast Sales	**0.41%**	**0.43%**	**0.45%**	**0.46%**	**0.46%**	**0.48%**	**0.50%**	**0.52%**	**0.54%**	**0.55%**
Utility Re-Participation	129	127	598	282	518	300	391	787	1,209	1,522
Total All Buildings (includes Re-participation)	**2,186**	**2,306**	**2,915**	**2,698**	**2,989**	**2,914**	**3,174**	**3,722**	**4,294**	**4,710**
% of Sales with Re-Participation	**0.43%**	**0.45%**	**0.56%**	**0.51%**	**0.56%**	**0.54%**	**0.57%**	**0.66%**	**0.75%**	**0.81%**
Codes & Standards	**3,378**	**4,054**	**4,911**	**4,942**	**5,268**	**5,271**	**5,237**	**4,622**	**3,364**	**2,619**
Incremental & Codes and Standard Effects as % of Forecast	**1.11%**	**1.24%**	**1.51%**	**1.45%**	**1.54%**	**1.50%**	**1.52%**	**1.49%**	**1.34%**	**1.27%**

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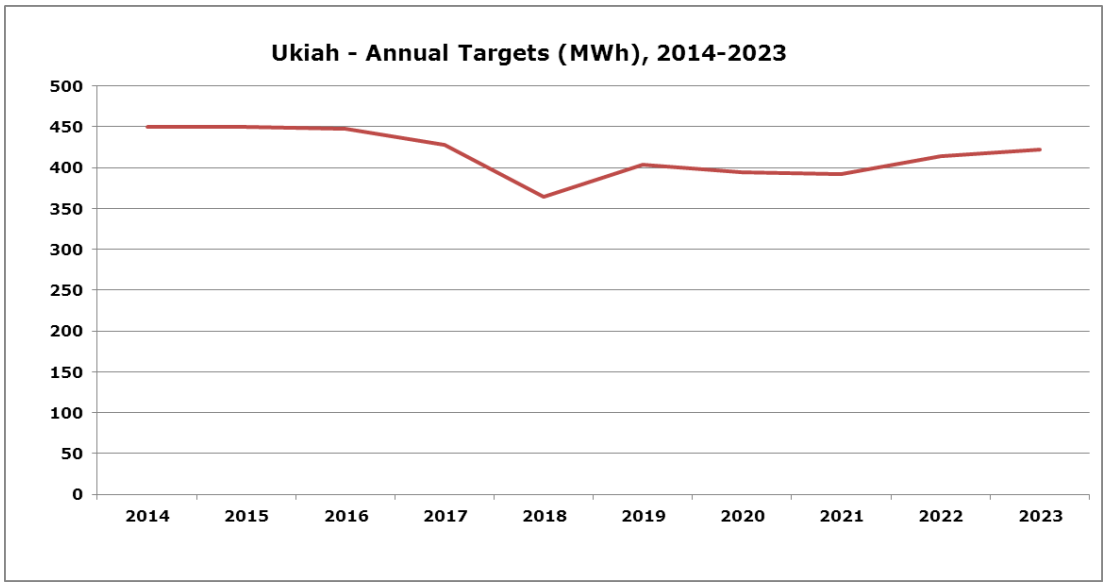
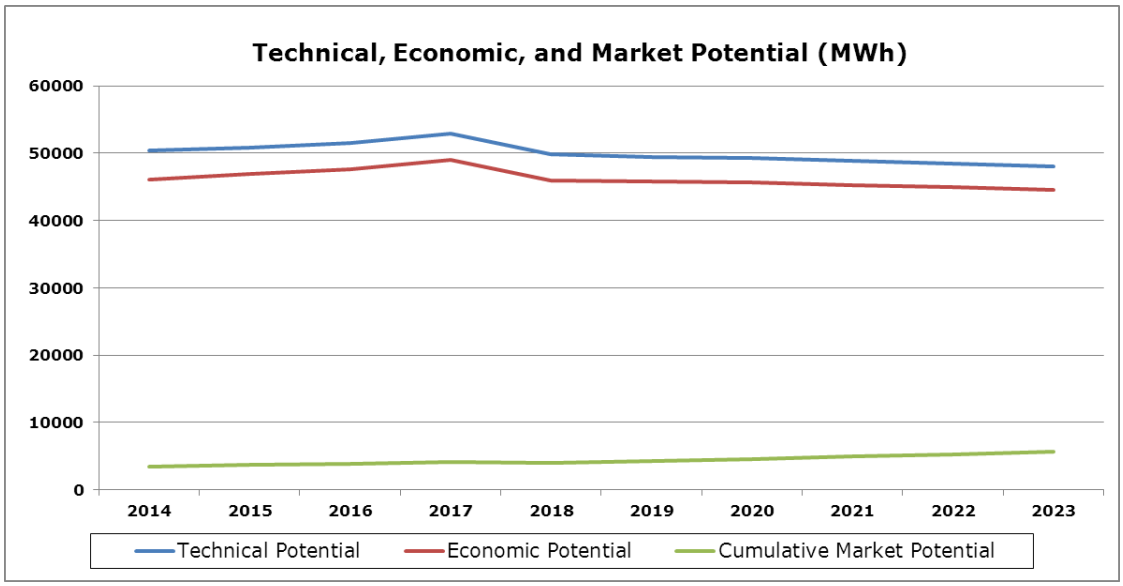


Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**450**	**450**	**448**	**428**	**364**	**404**	**395**	**391**	**414**	**423**
Total Energy Use (GWh):	120.80	122.80	124.83	126.90	129.00	131.13	133.30	135.51	137.75	140.03
Residential Sector Energy Use (GWH):	39.04	39.68	40.34	41.01	41.68	42.37	43.07	43.79	44.51	45.25
Commercial Sector Energy Use (GWH):	76.40	77.67	78.95	80.26	81.58	82.93	84.31	85.70	87.12	88.56
Industrial Sector Energy Use (GWH):	2.42	2.46	2.50	2.54	2.58	2.62	2.67	2.71	2.76	2.80
Target as Percent of Total	***0.49%***	***0.44%***	***0.36%***	***0.34%***	***0.28%***	***0.31%***	***0.30%***	***0.29%***	***0.30%***	***0.30%***
Electric Demand										
Adopted Target (MW)	**0.10**	**0.10**	**0.10**	**0.10**	**0.09**	**0.10**	**0.10**	**0.11**	**0.12**	**0.12**
Total Demand (MW):	37.82	38.44	39.08	39.72	40.38	41.05	41.73	42.42	43.12	43.83
Residential Demand (MW):	12.22	12.42	12.63	12.84	13.05	13.26	13.48	13.71	13.93	14.16
Commercial Demand (MW):	23.92	24.31	24.71	25.12	25.54	25.96	26.39	26.83	27.27	27.72
Industrial Demand (MW):	0.76	0.77	0.78	0.79	0.81	0.82	0.83	0.85	0.86	0.88
Target as Percent of Total	***0.28%***	***0.27%***	***0.26%***	***0.26%***	***0.23%***	***0.24%***	***0.24%***	***0.25%***	***0.28%***	***0.29%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	13,283	12,794	12,629	12,626	10,976	10,742	10,729	10,648	10,567	10,488
Commercial	36,808	37,742	38,593	40,004	38,564	38,373	38,245	37,898	37,562	37,232
Industrial & Agriculture	268	260	251	248	246	251	255	260	264	269
Total All Buildings	**50,359**	**50,796**	**51,472**	**52,878**	**49,786**	**49,365**	**49,230**	**48,806**	**48,393**	**47,989**
% of Forecast Sales	41.69%	41.36%	41.23%	41.67%	38.59%	37.65%	36.93%	36.02%	35.13%	34.27%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	4,396	3,806	3,485	3,447	3,287	3,289	3,284	3,272	3,257	3,245
Commercial	8,294	8,228	8,366	8,655	8,381	8,360	8,355	8,289	8,227	8,166
Industrial & Agricultural	46	46	46	46	46	47	48	48	49	50
Total All Buildings	**12,737**	**12,080**	**11,896**	**12,148**	**11,714**	**11,696**	**11,687**	**11,610**	**11,534**	**11,461**
% of Forecast Sales	33.68%	31.42%	30.44%	30.58%	29.01%	28.49%	28.01%	27.37%	26.75%	26.15%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	12,040	11,806	11,622	11,765	9,935	9,869	9,909	9,828	9,748	9,669
Commercial	33,793	34,790	35,794	37,043	35,782	35,620	35,522	35,204	34,896	34,594
Industrial & Agriculture	258	249	226	231	235	239	244	254	259	267
Total All Buildings	**46,091**	**46,846**	**47,641**	**49,038**	**45,953**	**45,729**	**45,675**	**45,286**	**44,903**	**44,530**
% of Forecast Sales	38.15%	38.15%	38.16%	38.64%	35.62%	34.87%	34.26%	33.42%	32.60%	31.80%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	2,686	2,439	2,085	2,248	2,077	2,070	2,059	2,045	2,032	2,020
Commercial	7,154	7,152	7,365	7,630	7,396	7,385	7,390	7,335	7,282	7,231
Industrial & Agriculture	44	44	42	43	44	45	46	47	48	50
Total All Buildings	**9,885**	**9,636**	**9,492**	**9,921**	**9,517**	**9,500**	**9,494**	**9,427**	**9,363**	**9,301**
% of Forecast Sales	26.14%	25.07%	24.29%	24.97%	23.57%	23.14%	22.75%	22.22%	21.71%	21.22%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	203	240	317	419	448	558	680	816	959	1,108
Commercial	3,166	3,399	3,540	3,734	3,446	3,663	3,877	4,089	4,295	4,497
Industrial & Agriculture	27	25	22	20	19	20	21	22	23	24
Total All Buildings	**3,396**	**3,664**	**3,879**	**4,173**	**3,913**	**4,241**	**4,579**	**4,927**	**5,278**	**5,629**
% of Forecast Sales	2.81%	2.98%	3.11%	3.29%	3.03%	3.23%	3.43%	3.64%	3.83%	4.02%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	112	91	113	151	184	231	283	340	400	464
Commercial	659	710	740	779	715	757	798	839	879	919
Industrial & Agriculture	4	4	3	4	4	4	4	4	4	5
Total All Buildings	**775**	**804**	**857**	**934**	**903**	**991**	**1,085**	**1,183**	**1,284**	**1,387**
% of Forecast Sales	2.05%	2.09%	2.19%	2.35%	2.23%	2.41%	2.60%	2.79%	2.98%	3.17%

Incremental Market Potential

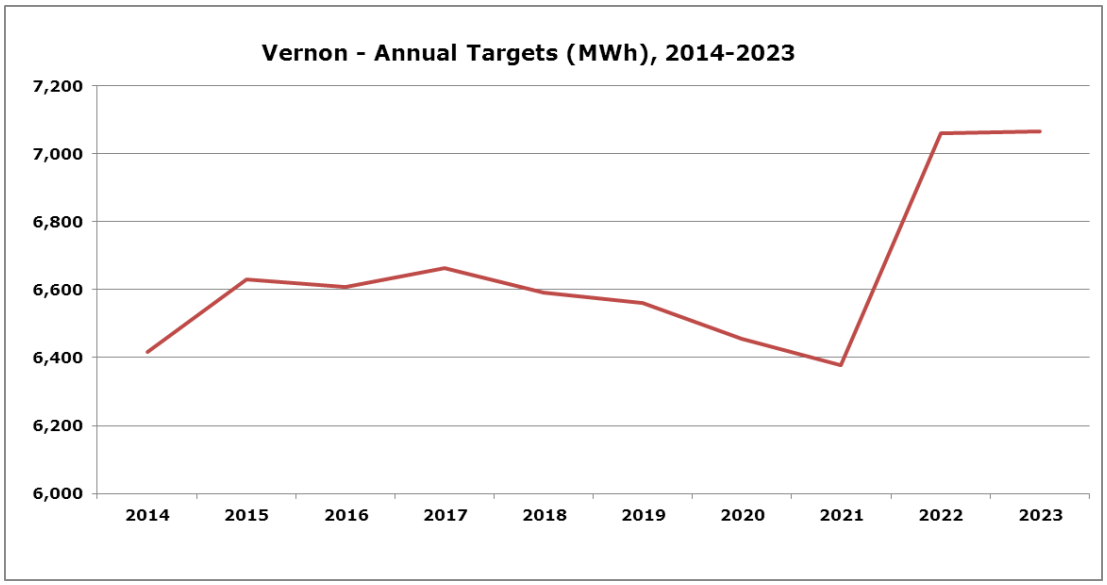
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	57	73	87	105	103	117	130	142	151	157
Commercial	519	425	353	306	244	226	219	216	213	209
Industrial & Agriculture	6	4	2	2	2	2	1	1	1	1
Total All Buildings	**582**	**503**	**442**	**413**	**349**	**344**	**351**	**359**	**366**	**368**
% of Forecast Sales	**0.48%**	**0.41%**	**0.35%**	**0.33%**	**0.27%**	**0.26%**	**0.26%**	**0.27%**	**0.27%**	**0.26%**
Utility Re-Participation	10	34	5	14	16	60	44	32	49	55
Total All Buildings (includes Re-participation)	**593**	**537**	**448**	**428**	**364**	**404**	**395**	**391**	**414**	**423**
% of Sales with Re-Participation	**0.49%**	**0.44%**	**0.36%**	**0.34%**	**0.28%**	**0.31%**	**0.30%**	**0.29%**	**0.30%**	**0.30%**
Codes & Standards	**334**	**448**	**536**	**540**	**769**	**769**	**753**	**730**	**643**	**560**
Incremental & Codes and Standard Effects as % of Forecast	**0.76%**	**0.77%**	**0.78%**	**0.75%**	**0.87%**	**0.85%**	**0.83%**	**0.80%**	**0.73%**	**0.66%**

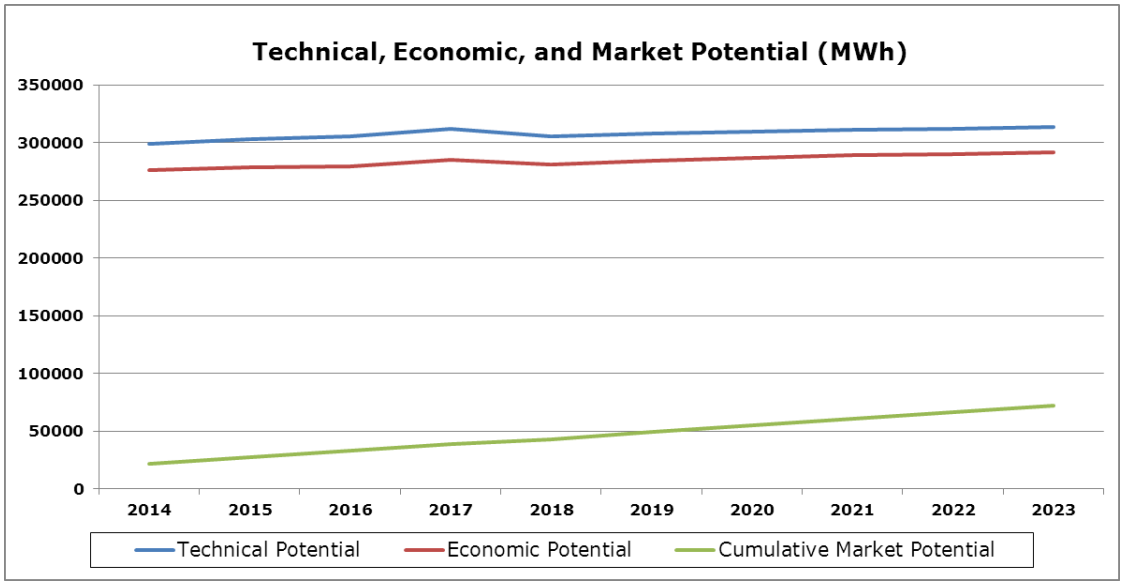
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	24	29	30	38	42	47	53	58	63	67
Commercial	109	89	72	61	47	43	42	42	42	41
Industrial & Agriculture	1	1	0	0	0	0	0	0	0	0
Total All Buildings	**134**	**119**	**102**	**100**	**90**	**91**	**95**	**100**	**105**	**108**
% of Forecast Sales	**0.35%**	**0.31%**	**0.26%**	**0.25%**	**0.22%**	**0.22%**	**0.23%**	**0.24%**	**0.24%**	**0.25%**
Utility Re-Participation	4	6	1	2	2	7	6	5	14	17
Total All Buildings (includes Re-participation)	**138**	**124**	**103**	**102**	**92**	**99**	**101**	**105**	**119**	**125**
% of Sales with Re-Participation	**0.36%**	**0.32%**	**0.26%**	**0.26%**	**0.23%**	**0.24%**	**0.24%**	**0.25%**	**0.28%**	**0.29%**
Codes & Standards	**202**	**169**	**211**	**215**	**244**	**242**	**240**	**222**	**179**	**157**
Incremental & Codes and Standard Effects as % of Forecast	**0.89%**	**0.75%**	**0.80%**	**0.79%**	**0.83%**	**0.81%**	**0.80%**	**0.76%**	**0.66%**	**0.60%**

CITY OF VERNON LIGHT & POWER



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**6,417**	**6,631**	**6,609**	**6,664**	**6,592**	**6,561**	**6,454**	**6,377**	**7,060**	**7,065**
Total Energy Use (GWh):	1,208.83	1,227.55	1,245.26	1,261.76	1,280.68	1,299.89	1,319.39	1,339.18	1,359.27	1,379.66
Residential Sector Energy Use (GWH):	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.16
Commercial Sector Energy Use (GWH):	244.50	248.29	251.87	255.21	259.04	262.92	266.87	270.87	274.93	279.06
Industrial Sector Energy Use (GWH):	940.71	955.28	969.06	981.90	996.63	1,011.58	1,026.76	1,042.16	1,057.79	1,073.66
Target as Percent of Total	***0.53%***	***0.54%***	***0.53%***	***0.53%***	***0.51%***	***0.50%***	***0.49%***	***0.48%***	***0.52%***	***0.51%***
Electric Demand										
Adopted Target (MW)	**1.19**	**1.24**	**1.25**	**1.25**	**1.23**	**1.23**	**1.21**	**1.21**	**1.33**	**1.33**
Total Demand (MW):	197.38	200.44	203.33	206.02	209.11	212.25	215.43	218.67	221.95	225.28
Residential Demand (MW):	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Commercial Demand (MW):	39.92	40.54	41.13	41.67	42.30	42.93	43.58	44.23	44.89	45.57
Industrial Demand (MW):	153.60	155.98	158.23	160.33	162.73	165.17	167.65	170.17	172.72	175.31
Target as Percent of Total	***0.60%***	***0.62%***	***0.61%***	***0.61%***	***0.59%***	***0.58%***	***0.56%***	***0.55%***	***0.60%***	***0.59%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	55	52	50	52	46	44	44	45	45	44
Commercial	147,539	150,786	153,710	159,191	151,007	150,564	150,271	148,906	147,568	146,254
Industrial & Agriculture	151,563	151,845	151,941	152,995	154,316	156,841	159,407	161,898	164,428	166,997
Total All Buildings	**299,157**	**302,683**	**305,701**	**312,238**	**305,369**	**307,450**	**309,723**	**310,849**	**312,041**	**313,294**
% of Forecast Sales	24.75%	24.66%	24.55%	24.75%	23.84%	23.65%	23.47%	23.21%	22.96%	22.71%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	19	17	15	15	15	15	15	15	15	14
Commercial	32,406	32,400	32,903	34,059	32,502	32,557	32,642	32,377	32,119	31,865
Industrial & Agricultural	27,658	27,912	28,138	28,440	28,795	29,267	29,745	30,210	30,682	31,162
Total All Buildings	**60,083**	**60,328**	**61,056**	**62,514**	**61,312**	**61,838**	**62,402**	**62,602**	**62,816**	**63,042**
% of Forecast Sales	30.44%	30.10%	30.03%	30.34%	29.32%	29.13%	28.97%	28.63%	28.30%	27.98%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	41	40	40	43	37	40	40	41	41	39
Commercial	127,021	129,201	131,732	135,632	128,611	128,405	128,346	128,054	126,935	125,838
Industrial & Agriculture	149,333	149,580	147,348	149,504	151,954	155,749	158,299	160,773	163,286	165,838
Total All Buildings	**276,395**	**278,821**	**279,120**	**285,180**	**280,602**	**284,195**	**286,685**	**288,868**	**290,262**	**291,716**
% of Forecast Sales	22.86%	22.71%	22.41%	22.60%	21.91%	21.86%	21.73%	21.57%	21.35%	21.14%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	11	10	9	9	9	9	9	9	8	8
Commercial	25,829	25,826	26,400	27,292	25,970	26,095	26,247	26,628	26,430	26,237
Industrial & Agriculture	27,242	27,489	27,495	27,897	28,355	29,063	29,539	30,000	30,469	30,945
Total All Buildings	**53,082**	**53,325**	**53,904**	**55,198**	**54,334**	**55,166**	**55,794**	**56,637**	**56,908**	**57,190**
% of Forecast Sales	26.89%	26.60%	26.51%	26.79%	25.98%	25.99%	25.90%	25.90%	25.64%	25.39%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	1	1	2	2	3	4	5	6	7
Commercial	8,210	9,374	10,447	11,763	11,430	12,900	14,388	15,876	17,317	18,711
Industrial & Agriculture	13,356	17,822	22,275	26,934	31,457	36,104	40,645	45,083	49,077	52,932
Total All Buildings	**21,567**	**27,196**	**32,723**	**38,700**	**42,889**	**49,008**	**55,037**	**60,964**	**66,400**	**71,650**
% of Forecast Sales	1.78%	2.22%	2.63%	3.07%	3.35%	3.77%	4.17%	4.55%	4.88%	5.19%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	1	1	1	1	2	2	2
Commercial	1,558	1,772	1,988	2,255	2,166	2,461	2,759	3,065	3,366	3,660
Industrial & Agriculture	2,392	3,248	4,118	5,007	5,870	6,737	7,584	8,413	9,158	9,877
Total All Buildings	**3,951**	**5,020**	**6,106**	**7,262**	**8,037**	**9,200**	**10,345**	**11,479**	**12,525**	**13,539**
% of Forecast Sales	2.00%	2.50%	3.00%	3.52%	3.84%	4.33%	4.80%	5.25%	5.64%	6.01%

Incremental Market Potential

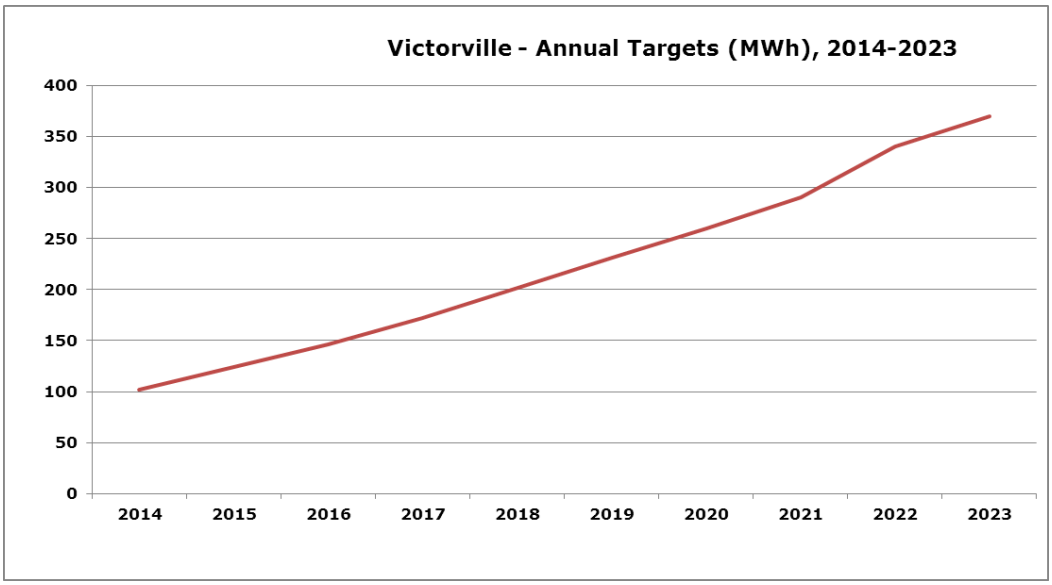
Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	1	1	1	1	1	1	1	1
Commercial	1,711	1,687	1,657	1,653	1,515	1,521	1,523	1,526	1,501	1,456
Industrial & Agriculture	4,617	4,843	4,886	4,889	4,813	4,740	4,643	4,546	4,471	4,384
Total All Buildings	**6,329**	**6,531**	**6,544**	**6,542**	**6,329**	**6,262**	**6,167**	**6,073**	**5,972**	**5,841**
% of Forecast Sales	**0.52%**	**0.53%**	**0.53%**	**0.52%**	**0.49%**	**0.48%**	**0.47%**	**0.45%**	**0.44%**	**0.42%**
Utility Re-Participation	88	100	65	123	263	299	287	304	1,087	1,224
Total All Buildings (includes Re-participation)	**6,417**	**6,631**	**6,609**	**6,664**	**6,592**	**6,561**	**6,454**	**6,377**	**7,060**	**7,065**
% of Sales with Re-Participation	**0.53%**	**0.54%**	**0.53%**	**0.53%**	**0.51%**	**0.50%**	**0.49%**	**0.48%**	**0.52%**	**0.51%**
Codes & Standards	**989**	**1,330**	**1,717**	**1,784**	**2,219**	**2,196**	**2,173**	**2,150**	**1,636**	**1,436**
Incremental & Codes and Standard Effects as % of Forecast	**0.61%**	**0.65%**	**0.67%**	**0.67%**	**0.69%**	**0.67%**	**0.65%**	**0.64%**	**0.64%**	**0.62%**

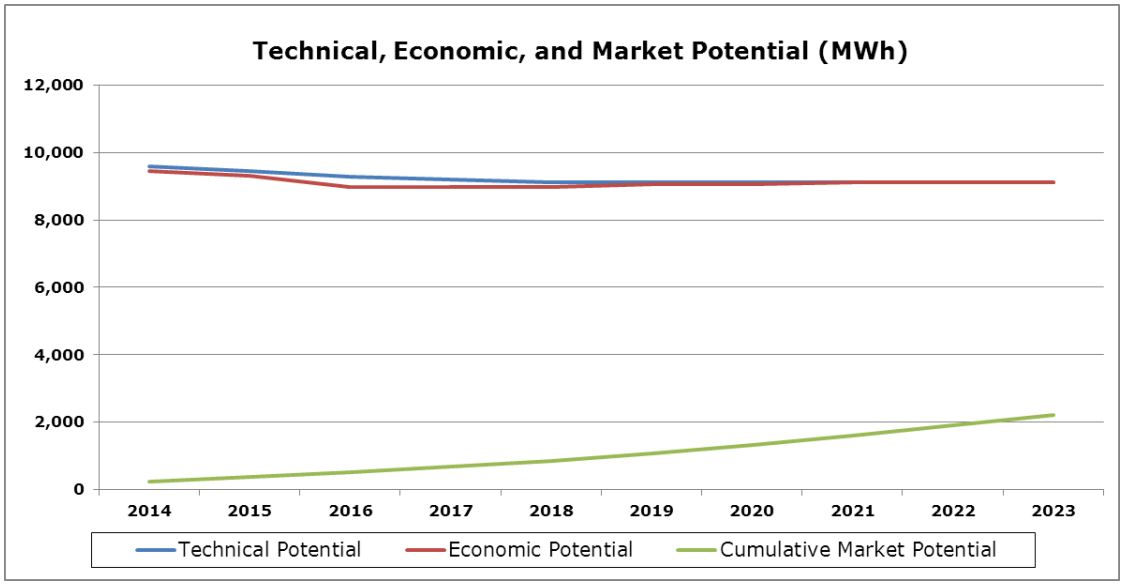
Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	334	330	326	326	297	299	301	310	308	301
Industrial & Agriculture	842	893	912	912	898	885	866	848	834	818
Total All Buildings	**1,177**	**1,224**	**1,238**	**1,239**	**1,196**	**1,184**	**1,168**	**1,158**	**1,142**	**1,120**
% of Forecast Sales	**0.60%**	**0.61%**	**0.61%**	**0.60%**	**0.57%**	**0.56%**	**0.54%**	**0.53%**	**0.51%**	**0.50%**
Utility Re-Participation	15	17	11	14	38	44	46	49	193	213
Total All Buildings (includes Re-participation)	**1,192**	**1,241**	**1,249**	**1,252**	**1,234**	**1,228**	**1,214**	**1,208**	**1,335**	**1,333**
% of Sales with Re-Participation	**0.60%**	**0.62%**	**0.61%**	**0.61%**	**0.59%**	**0.58%**	**0.56%**	**0.55%**	**0.60%**	**0.59%**
Codes & Standards	**411**	**245**	**335**	**348**	**446**	**441**	**437**	**432**	**355**	**329**
Incremental & Codes and Standard Effects as % of Forecast	**0.81%**	**0.74%**	**0.78%**	**0.78%**	**0.80%**	**0.79%**	**0.77%**	**0.75%**	**0.76%**	**0.74%**

VICTORVILLE MUNICIPAL UTILITY SERVICES



Electric Energy	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adopted Target (MWh)	**102**	**124**	**146**	**172**	**202**	**231**	**260**	**291**	**341**	**370**
Total Energy Use (GWh):	73.15	73.15	73.15	73.15	73.15	73.15	73.15	73.15	73.15	73.15
Residential Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial Sector Energy Use (GWH):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Sector Energy Use (GWH):	73.15	73.15	73.15	73.15	73.15	73.15	73.15	73.15	73.15	73.15
Target as Percent of Total	***0.14%***	***0.17%***	***0.20%***	***0.24%***	***0.28%***	***0.32%***	***0.36%***	***0.40%***	***0.47%***	***0.51%***
Electric Demand										
Adopted Target (MW)	**0.02**	**0.02**	**0.03**	**0.03**	**0.04**	**0.04**	**0.05**	**0.05**	**0.06**	**0.07**
Total Demand (MW):	15.38	16.06	16.78	17.52	18.30	19.12	19.97	20.85	21.78	22.75
Residential Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial Demand (MW):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Demand (MW):	15.38	16.06	16.78	17.52	18.30	19.12	19.97	20.85	21.78	22.75
Target as Percent of Total	***0.12%***	***0.14%***	***0.16%***	***0.18%***	***0.21%***	***0.23%***	***0.24%***	***0.26%***	***0.29%***	***0.30%***



Technical Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agriculture	9,600	9,435	9,269	9,187	9,104	9,104	9,104	9,104	9,104	9,104
Total All Buildings	**9,600**	**9,435**	**9,269**	**9,187**	**9,104**	**9,104**	**9,104**	**9,104**	**9,104**	**9,104**
% of Forecast Sales	13.13%	12.90%	12.67%	12.56%	12.45%	12.45%	12.45%	12.45%	12.45%	12.45%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agricultural	1,745	1,730	1,714	1,706	1,699	1,699	1,699	1,699	1,699	1,699
Total All Buildings	**1,745**	**1,730**	**1,714**	**1,706**	**1,699**	**1,699**	**1,699**	**1,699**	**1,699**	**1,699**
% of Forecast Sales	11.35%	10.77%	10.22%	9.74%	9.28%	8.89%	8.51%	8.15%	7.80%	7.47%

Economic Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agriculture	9,461	9,295	8,964	8,964	8,964	9,046	9,046	9,101	9,101	9,101
Total All Buildings	**9,461**	**9,295**	**8,964**	**8,964**	**8,964**	**9,046**	**9,046**	**9,101**	**9,101**	**9,101**
% of Forecast Sales	12.93%	12.71%	12.26%	12.26%	12.26%	12.37%	12.37%	12.44%	12.44%	12.44%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agriculture	1,719	1,704	1,673	1,673	1,673	1,688	1,688	1,698	1,698	1,698
Total All Buildings	**1,719**	**1,704**	**1,673**	**1,673**	**1,673**	**1,688**	**1,688**	**1,698**	**1,698**	**1,698**
% of Forecast Sales	11.18%	10.60%	9.97%	9.55%	9.14%	8.83%	8.45%	8.14%	7.80%	7.47%

Cumulative Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agriculture	251	370	506	672	862	1,084	1,334	1,610	1,906	2,222
Total All Buildings	**251**	**370**	**506**	**672**	**862**	**1,084**	**1,334**	**1,610**	**1,906**	**2,222**
% of Forecast Sales	0.34%	0.51%	0.69%	0.92%	1.18%	1.48%	1.82%	2.20%	2.61%	3.04%

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agriculture	45	68	94	125	161	202	249	300	356	415
Total All Buildings	**45**	**68**	**94**	**125**	**161**	**202**	**249**	**300**	**356**	**415**
% of Forecast Sales	0.30%	0.42%	0.56%	0.71%	0.88%	1.06%	1.25%	1.44%	1.63%	1.82%

Incremental Market Potential

Energy Potential (MWh)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agriculture	102	124	144	170	196	224	252	279	305	327
Total All Buildings	**102**	**124**	**144**	**170**	**196**	**224**	**252**	**279**	**305**	**327**
% of Forecast Sales	**0.14%**	**0.17%**	**0.20%**	**0.23%**	**0.27%**	**0.31%**	**0.34%**	**0.38%**	**0.42%**	**0.45%**
Utility Re-Participation	0	0	2	2	6	7	9	12	36	43
Total All Buildings (includes Re-participation)	**102**	**124**	**146**	**172**	**202**	**231**	**260**	**291**	**341**	**370**
% of Sales with Re-Participation	**0.14%**	**0.17%**	**0.20%**	**0.24%**	**0.28%**	**0.32%**	**0.36%**	**0.40%**	**0.47%**	**0.51%**
Codes & Standards	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Incremental & Codes and Standard Effects as % of Forecast	**0.14%**	**0.17%**	**0.20%**	**0.24%**	**0.28%**	**0.32%**	**0.36%**	**0.40%**	**0.47%**	**0.51%**

Demand Potential (kW)

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Residential	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Industrial & Agriculture	18	23	27	32	37	42	47	52	57	61
Total All Buildings	**18**	**23**	**27**	**32**	**37**	**42**	**47**	**52**	**57**	**61**
% of Forecast Sales	**0.12%**	**0.14%**	**0.16%**	**0.18%**	**0.20%**	**0.22%**	**0.24%**	**0.25%**	**0.26%**	**0.27%**
Utility Re-Participation	0	0	0	0	1	1	2	2	7	8
Total All Buildings (includes Re-participation)	**18**	**23**	**27**	**32**	**38**	**43**	**49**	**54**	**64**	**69**
% of Sales with Re-Participation	**0.12%**	**0.14%**	**0.16%**	**0.18%**	**0.21%**	**0.23%**	**0.24%**	**0.26%**	**0.29%**	**0.30%**
Codes & Standards	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Incremental & Codes and Standard Effects as % of Forecast	**0.12%**	**0.14%**	**0.16%**	**0.18%**	**0.21%**	**0.23%**	**0.24%**	**0.26%**	**0.29%**	**0.30%**

APPENDIX E: LIST OF REFERENCES

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