Attachment 1

Pasadena Water and Power
Energy Efficiency and Demand Reduction Policy and Goals

On September 18, 2006 the City of Pasadena adopted the United Nations Urban Environmental Accords ("UEA") and endorsed the US Mayors' Climate Protection Agreement. The UEA goals are aimed to provide leadership to develop sustainable urban centers and promote a clean, healthy and safe environment for all members of society. One of Pasadena's UEA goals is to reduce the city's peak electric load by 10% within seven years of adopting the UEA as a means to reduce GHG emissions.

Pasadena Water and Power ("PWP") is a signatory to the "Memorandum Of Understanding Pledging The Support Of The State Of California For The National Action Plan For Energy Efficiency."

The Energy Efficiency bill SB-1037 (2005), requires each local publicly owned electric utility to acquire all cost effective, reliable, and feasible energy efficiency ("EE") and demand reduction ("DR") prior to other resources. It requires each local publicly owned electric utility ("POU") to report its investment on EE and demand reduction programs annually to its customers and to the California Energy Commission ("CEC").

The Energy Efficiency bill AB-2021 (2006) is intended to enable the state to meet its goal of reducing total forecasted electrical consumption by ten percent over the next ten years. Each POU, on or before June 1, 2007, and every 3 years thereafter, must identify all potentially achievable cost-effective EE savings and establish annual targets for EE savings and DR over ten years. The bill requires each POU to report annually to its customers and the CEC on its investment in EE and DR programs and the results of an independent evaluation that measures and verifies the EE savings and reduction in energy demand achieved by its EE and DR programs. It further requires POU's to "treat investments made to achieve energy efficiency and demand reduction targets as procurement investments."

Consistent with the Urban Environmental Accords, AB-1037, and AB-2021, PWP shall:

- Treat EE and DR as an energy procurement function, and procure all cost-effective EE and DR prior to other resources;
- Strive to reduce energy consumption by an average of 1.33% per year, and summer peak demand by 6.8%, from the "Baseline" energy consumption level (i.e., the annual energy consumption that would otherwise occur if PWP had no EE programs) over ten years from January 1, 2007 to December 31, 2016; and
- Reduce summer peak electric demand by 10% from the Baseline peak demand by October 1, 2012 through the most cost-effective combination of EE and DR programs, rate incentives, load-shifting technologies, and customer-owned high efficiency or GHG-free distributed generation such as PV and wind

These programs shall be funded through Public Benefit Charge revenues.

Attachment 2

Pasadena Water and Power
Solar Photovoltaic Program

On September 18, 2006 the City of Pasadena adopted the United Nations Urban Environmental Accords (“UEA”) and endorsed the US Mayors’ Climate Protection Agreement. The UEA goals are aimed to provide leadership to develop sustainable urban centers and promote a clean, healthy and safe environment for all members of society. Pasadena’s UEA goals include increasing renewable resources and reducing the city’s peak electric load as a means to reduce GHG emissions.

On August 21, 2006 the Governor signed Senate Bill 1 (“SB-1”) which aims to build 3,000 MW of solar photovoltaic system (“PV”) in California. SB-1 mandates that each Publicly Owned Utility (“POU”) adopt, implement, and finance a solar initiative program on or before January 1, 2008 to assist the state in meeting this goal.

Pasadena Water and Power (“PWP”) shall modify its existing PV incentive program to meet the above goals in accordance with the following guidelines:

- **Objective**: Install 14 Megawatts of customer-owned PV systems in Pasadena by December 31, 2017.
- **Eligibility**: Any customer taking electric service from PWP
- **PV System Requirements**: Each PV system must be installed in compliance with the California Public Resource Code Section 25782. The PV system must be located on the same premises of the end-use consumer where consumer’s own electric demand is located and connected to PWP’s electrical distribution system. All equipment must be new, carry a minimum ten-year warranty, and be Underwriter’s Laboratories (UL)-listed. While there is no maximum size restriction, incentives may be limited to a PV system capacity that would not produce an annual amount of energy in excess of the customer’s annual consumption.
- **Incentives**: The standard PV incentive shall initially be set at $3.50 per installed Watt. Incentives for qualifying non-profit agencies or low-income housing would initially be $4.00/Watt. These incentives shall periodically decline at an average 7% annually such that the standard incentive is no more than $1.69/Watt in 2017 ($1.93/Watt for qualifying non-profits).

  Incentives for solar energy systems greater than 30 kilowatts in size may be paid monthly based on the actual energy produced for a period of five years, while those for all systems less than 30 kilowatts will be paid a one-time, up-front incentive based on expected system performance.
- **Budget and Funding**: Effective FY2009, a minimum of $1.6 million per year shall be budgeted for PV incentives through FY2018 or until program goals are met. Funding to be provided through additional Public Benefits Charge revenues.
- **Program Effective Date**: No later than January 1, 2008.

Attachment 3

Establishing Energy Efficiency Target:
A Public Power Response to AB2021

California Municipal Utilities Association

Note: The attached report includes only Pasadena's results in the appendix.

The full report is available in PDF format on the internet at
www.PWPWeb.com

or directly at

http://cityofpasadena.net/waterandpower/pdf/CMUA_SCPPA_AB2021_ReportFinal.pdf

or

http://www.ncpa.com/images/stories/AB2021%20Report%20Final.pdf

CALIFORNIA MUNICIPAL UTILITIES ASSOCIATION

Establishing Energy Efficiency Targets:
A Public Power Response to AB2021

June 2007

Acknowledgements

The California Municipal Utilities Association (CMUA) wishes to acknowledge the following individuals for their substantial contributions to completing this effort:

Project Managers:

Scott Tomashefsky, Northern California Power Agency (NCPA)
Manny Robledo, Southern California Public Power Authority (SCPPA)
David Reynolds, Northern California Power Agency

Gary Ambach, Imperial Irrigation District	Gerald Katz, Colton Electric Utility
Mike Bacich, Riverside Public Utilities	Craig Kuennen, Glendale Water & Power
Jim Brands, Efficiency Services Group	Anthony Kekulawela, Port of Oakland
Theresa Boucher, Lassen MUD	Joyce Kinnear, Silicon Valley Power
Rick Coleman, Trinity PUD	David Kolk, City of Needles
Veronica Craghead, City of Banning	Rob Lechner, Lodi Electric Utility
Kurt Duvall, Corona Electric Utility	Mariann Long, Anaheim Public Utilities
Paul Eichenberger, City of Shasta Lake	Willie Manuel, Turlock Irrigation District
Phil Falkenstein, Imperial Irrigation District	Fred Mason, City of Banning
Nancy Folly, Turlock Irrigation District	Marlee Mattos, City of Biggs
Isaias Franco, Merced Irrigation District	Jeanette Meyers, Burbank Water & Power
Peter Govea, Modesto Irrigation District	Patrick Morrison, Roseville Electric
George Hanson, Moreno Valley Utilities	Jessica Nelson, Plumas-Sierra REC
Alan Harry, Truckee Donner PUD	Meredith Owens, Alameda Power & Telecom
Ted Haskell, Efficiency Services Group	Paul Reid, Azusa Light & Water
John Hoffner, Pasadena Water & Power	Glen Reddick, City of Hercules
Bob Hondeville, Modesto Irrigation District	Jan Roosevelt, Anaheim Public Utilities
Carla Johannesen, Roseville Electric	Mike Ten Eyck, City of Rancho Cucamonga
Bob Jones, Turlock Irrigation District	Vanessa Xie, Pittsburg Power/Island Energy
Mary Kammer, City of Lompoc	

Project Consultants (Rocky Mountain Institute):

John Anderson
Lena Hanson
Aaron Silverman
Kitty Wang

CMUA would like to thank our entire group of utility directors, general managers, elected officials, as well as our partner joint power agencies, NCPA and SCPPA, for dedicating resources and financial support for this effort. We would also like to thank the staff of the California Energy Commission (CEC), in particular Sylvia Bender, Cynthia Rogers, and Kae Lewis for their guidance and understanding in addressing the needs of the public power community in the development of this report.

TABLE OF CONTENTS

Executive Summary

California Assembly Bill 2021 (Levine), signed into law in September 2006, expanded upon several of the energy efficiency policies adopted via the passage of Senate Bill 1037 in 2005. This report complies with Section 3 of the statute, requiring each publicly-owned utility (POU) to:

> "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."

Similar to the approach taken to develop public power's energy efficiency status report last year pursuant to SB 1037, the California Municipal Utilities Association (CMUA), in partnership with the Northern California Power Agency (NCPA) and the Southern California Public Power Authority (SCPPA), have joined together to collaborate on the development of individual utility energy efficiency and demand reduction targets. A total of 35 POUs are participating in this report (Table 1). We note that the Los Angeles Department of Water and Power, the Sacramento Municipal Utility District, City of Palo Alto Utilities, and Redding Electric Utility are submitting data separate from this report.

The principal findings and conclusions of this analysis are as follows:

- **With the exception of Silicon Valley Power, which adopted its efficiency target on June 5, the estimates contained in this report are preliminary in nature and have not yet been approved by any other local governing board. With the concurrence of California Energy Commission (CEC) staff and commissioners, as well as general agreement from the office of Assemblyman Lloyd Levine (the principal author of AB2021), POUs submitting information in this report have until September 30, 2007 to submit formally-adopted estimates to the CEC.**

- The results from this analysis are based on a methodology developed by the Rocky Mountain Institute, an independent organization with well-accepted energy efficiency expertise in the energy industry.

- Energy efficiency programs among the 35 utilities participating in this analysis target a reduction in consumption of approximately 2,089 gigawatt hours and a peak demand decline of 274 megawatts during the ten-year period ending in 2016. This represents slightly more than an eight percent reduction in consumption over the period, and accommodates nearly half of public power load growth.

- Individual savings targets vary by utility for a variety of reasons, including but not limited to climate zone, community demographics, and load growth patterns. Achievable potential ranges for some utilities move well beyond the state's goal of 10 percent reduction in consumption.

- In total, energy program targets are more than double the historical annual energy savings achievements.

CMUA, NCPA, and SCPPA look forward to working with the CEC on energy efficiency issues, and are committed to balancing statewide energy policy direction with the needs and diverse interests of local communities. An updated report with targets adopted by each utility's respective governing boards will be submitted to the CEC in the first week of October.

I. Introduction

On September 26, 2006, Governor Schwarzenegger signed Assembly Bill 2021 (Levine) into law, expanding upon several of the energy efficiency policies adopted via the passage of Senate Bill 1037 in 2005. This report complies with Section 3 of the statute, requiring each publicly-owned utility to:

> "identify all potentially cost-effective electricity efficiency savings and shall establish annual targets for energy efficiency savings and demand reduction for the next 10-year period."

Similar to the approach taken to develop public power's energy efficiency status report last year, the California Municipal Utilities Association (CMUA), in partnership with the Northern California Power Agency (NCPA) and the Southern California Public Power Authority (SCPPA), have joined together to collaborate on the development of individual utility energy efficiency targets. A total of 35 POUs are participating in this report (Table 1).

Table 1
Publicly-owned Utilities Participating in Report

Alameda	Imperial Irrigation District	Plumas Sierra
Anaheim	Industry	Port of Oakland
Azusa	Lassen MUD	Rancho Cucamonga
Banning	Lodi	Riverside
Biggs	Lompoc	Roseville
Burbank	Merced	Shasta Lake
Colton	Modesto Irrigation District	Silicon Valley Power (Santa Clara)
Corona	Moreno Valley	Trinity PUD
Glendale	Needles	Truckee Donner PUD
Gridley	Pasadena	Turlock Irrigation District
Healdsburg	Pittsburg Power Company/ Island Energy	Ukiah
Hercules		Vernon

A considerable amount of time and resources have been put into this effort. Rocky Mountain Institute (RMI) was retained to develop an Excel-based tool that can be used to establish energy efficiency targets for each utility. Approximately $150,000 of contract dollars was dedicated to this effort. The total cost in time and money associated with this project, however, is considerably greater, when utility staff time, workshop participation, and CMUA/NCPA/SCPPA coordination is taken into consideration.

The following report contains three additional sections. Section II addresses the RMI model and the methodology surrounding the calculation of energy efficiency potential targets. As described in this report, it is assumed by the POUs participating in this project that Section II addresses the requirement in AB2021 that calls for utilities to describe the basis for establishing individual targets. Critical to this section is an explanation of the distinction between theoretical cost-effective potential, and the utility-specified feasible number. A list of caveats and considerations related to the numbers being provided is also included in this section.

Section III provides each utility's energy efficiency and demand reduction targets followed by some concluding thoughts for future consideration. Individual program summaries are contained in the Appendix. Section IV describes some of the lessons learned from the current study and provides thoughts for consideration by the POUs when they update their energy efficiency potentials again within the next three years.

With the exception of Silicon Valley Power, which adopted its efficiency target on June 5, the estimates contained in this report are preliminary in nature and have not yet been approved by any other local governing board. With the concurrence of CEC staff and commissioners, as well as general agreement from the office of Assemblyman Lloyd Levine (the principal author of AB2021), POUs submitting information in this report have until September 30, 2007 to submit formally-adopted estimates to the CEC. Recognizing the timing of the data needed for the CEC to complete its Integrated Energy Policy Report cycle without delay, the CEC has agreed to accept preliminary data from the POUs in this regard.

II. RMI Model and Methodology

RMI's energy efficiency potential model is designed to calculate technical, cost-effective, and feasible energy efficiency potential for a utility's service area. The model forecasts energy savings and demand reduction potential in existing buildings and new construction for the residential, commercial, and industrial sectors for the years 2007-2016. Though flexible enough to be applied to any utility, customized versions of the model have been created to reflect the specific characteristics of each POU participating in the AB2021 project. In particular, the model allows specific adjustments for:

- Forecasted energy load and demand growth,
- Climate (using Title 24 climate zones),
- Customer mix (by building type and industry),
- End use characteristics,
- Forecasted avoided costs and customer rates,
- POU and ratepayer discount rates,
- Non-capital program costs, including POU incentives and marketing/EM&V/admin, and
- POU-specified feasible quantities for each measure

The model is based on the California Energy Efficiency Potential Study (CEEPS), prepared by Itron in 2006 for California's investor-owned utilities (IOUs) - Pacific Gas & Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E). Cost and potential efficiency savings of individual measures considered in that study were imported into the RMI model. Baseline results for an IOU (baseline IOU), such as technical energy and demand reduction potential, were converted into relative potentials that were then adjusted, and finally applied to each participating POU. The cost test methodology used in the model to calculate cost-effective efficiency potential is adapted from that developed by Energy and Environmental Economics, Inc. (E3).

For practical reasons primarily related to file size constraints, the model has been created as a set of three complementary Excel files. The first file calculates technical efficiency potential. The results of this model are then used to determine cost-effective efficiency potential. The cost test model includes tables and charts illustrating the technical and cost-effective potential for each sector. In the last step, the cost-effective results are used as a basis for estimating feasible potential. The graphs in the feasible model show the combined technical, cost-effective, and feasible results. The summary table in the feasible model contains the results each POU will report in accordance with AB2021 obligations.

A. Data Sources

RMI relied on a number of data sources for the development of the model, as shown in the following list and Table 2.

- Itron, California Energy Efficiency Potential Study (San Diego, CA: Itron, 2006).
- Itron, California Commercial End-Use Survey (San Diego, CA: Itron, 2006).
- KEMA-XENERGY, California Statewide Residential Appliance Saturation Study (Oakland, CA: KEMA-XENERGY, 2004).
- KEMA-XENERGY, California Statewide Residential Sector Energy Efficiency Potential Study (Oakland, CA: KEMA-XENERGY, 2003).

Table 2. Summary of Specific Data and Metrics Used to Determine Efficiency Potential for Each Sector[1]

Sector	Type	Data Source	Data Information	Metrics
Residential	Existing	CEEPS Appendix F • [IOU]Res.xls	• Measure level	• kWh/unit potential • Total kWh potential • Incremental measure cost • Measure lifetime
	New	CEEPS Appendix I • [IOU]ResAppendix.xls	• Packages of measures • Only HVAC and water heating addressed • Packages result in both electricity and natural gas savings • Packages defined to exceed 2005 T24 building codes by 15%[2]	• Therms/unit potential • kWh/unit potential • Total kWh potential • Incremental package cost • Package lifetime
Commercial	Existing	CEEPS Appendix G • [IOU]HVAC.xls • [IOU]Lighting.xls	• Measure level	• kWh/unit potential • Total kWh potential • Incremental measure cost

[1] Many of the Excel files listed in the table have separate versions for each of the three investor-owned utilities (IOUs). In these instances, "[IOU]" has been substituted for the actual utility name in this table. The data source for a given participating POU was based upon the default IOU and climate zone specified by that POU.

[2] Itron developed a number of packages defined by the amount by which it exceeds either 2001 or 2005 Title 24 building standards. For this analysis, RMI used only those packages based on 2005 standards. Furthermore, the data set consists of packages for several types of single family and multi family homes, such as single family one-story, single family two-story, single family attached, multi family two-story, and multi family three-story. To simplify our analysis, the savings and cost data were averaged into one set of values for single family homes and one set of values for multi family homes.

Sector	Type	Data Source	Data Information	Metrics
		• [IOU]Misc.xls • [IOU]Refrigeration.xls		• Measure lifetime
	New	CEEPS Appendix J • [IOU]ComAppendix.xls	• Packages of measures • Only HVAC and water heating addressed • Packages result in both electricity and natural gas savings • Packages defined to exceed 2005 T24 building codes by 15%	• Therms/unit potential • kWh/unit potential • Total kWh potential • Incremental package cost • Package lifetime
Industrial	Conventional Industries – Existing Facilities	CEEPS Appendix H • IndustrialOutputs.xls	• End use level[3]	• Total kWh potential • Levelized costs of individual measures[4]
	Conventional Industries – New Construction	CEEPS Appendix K • [IOU]IndAppendix.xls	• Measure level, except packages for lighting/HVAC	• kWh potential per baseline MWh consumed • Incremental measure/package cost • Measure/package lifetime
	High-Tech Industries	Public Reports, Personal Interviews, RMI Estimates[5]	• Measure level	• Savings as % of baseline consumption for targeted end use

B. Customization

A number of customization options have been built into the model to ensure that the results reflect the unique characteristics of each POU's service area. Though each POU's results are based upon the same modeling framework, these customization options ensure that the potential results accurately reflect each POU's size, growth rate, climate zone, and customer base. The model also allows each POU to specify various financial parameters, including customer rates, energy costs, discount rates, customer rebate levels, and overhead.

[3] Reporting end use level data for industrial rather than measure level data captures the additive effects of combining measures.

[4] RMI averaged levelized costs of each measure to develop levelized costs for each end use.

[5] A full list of sources consulted is included in the discussion of high-tech industries.

Forecasted Sales and Demand Growth

The RMI model forecasts energy savings on a relative basis, as a function of forecasted sales. Though the actual efficiency potential is calculated based upon sales to various customer sectors, each POU also provided its baseline system total sales forecast so that it could be compared to the system total sales forecast after implementation of efficiency programs. The model also requires each POU to provide a 10-year forecast of system peak demand. Both values represent total sales, rather than energy or power at the city gate.

Though all utilities were able to provide sales forecasts, some utilities did not provide peak demand forecasts. In these instances, peak demand was grown at the same rate as total system consumption. Like total system consumption, the system peak values were used only as outputs. Peak demand reduction potential was estimated as a function of energy savings potential (more detailed explanation provided in subsequent sections of this appendix).

The calculations of efficiency potential were based upon the sector-level sales. The model thus requires each POU to also break down system total sales into the three primary sectors: residential, commercial[6], and industrial. Other sectors, such as agriculture, were included in the system total but were not evaluated for efficiency potential, as the CEEPS report did not include applicable measures.

It is important to note that the model requires commercial and industrial sector sales forecasts to be based on the type of business, rather than on the customer's size. As such, it is highly recommended that POUs distinguish between commercial and industrial customers within the same size category (for example between 200kW and 1000 kW) when inputting data into the model. The efficiency measures in the model apply to specific building types and industries. The commercial and industrial sectors are defined in the following section on customer mix.

Customer Mix (By Building Type/Industry) and End Use Characteristics

At the outset of the study, each POU was asked to provide building type and end use proportions for their service territory. The full lists of building types and end use types used in the model are provided in Table 3 and 4, respectively. If these proportions were unavailable, RMI substituted the attributes of the IOU that each participant felt was most similar to their own POU.

[6] Municipal loads were included in the commercial sector.

Table 3. Enumeration of Building Types in Model, by Sector

Residential	Commercial	Industrial
Mobile Homes	College	Chemicals
Multi-Family	Grocery	Electronics
Single-Family	Health	Fab. Metals
	Lodging	Food
	Large Office	Industrial Machines
	Miscellaneous	Instruments
	Refrigerated Warehouse	Lumber, Furniture
	Retail	Miscellaneous
	Restaurant	Paper
	School	Petroleum
	Small Office	Primary Metals
	Warehouse	Printing
		Rubber, Plastics
		Stone, Clay, Glass
		Textiles, Apparel
		Transportation Equipment
		Data Center
		Semiconductor Manufacturer
		Lab

Table 4. Enumeration of End Use Types in Model, by Sector

Residential	Commercial	Industrial
HVAC	Cooking	Compressed Air
Lighting	HVAC	Cooling
Miscellaneous	Lighting	Drives
Refrigeration	Miscellaneous	Fans
Water Heating	Refrigeration	Heating
	Water Heating	Lighting
		Other
		Pumps
		Refrigeration

Climate

To account for the impact of climate on equipment usage patterns, the technical potential for each measure was calculated based upon typical usage patterns specified for the Title 24 Climate Zone applicable to each POU. Additional details concerning this adjustment are included in the technical potential discussion.

Rates and Avoided Costs

Each POU's current and forecasted rate schedule was used in the calculation of the Participant Cost test and the Rate Impact Measure test. If a forecast was unavailable, RMI grew each POU's current rates by 3% each year. Utilities also provided their forecasted avoided energy costs for use in performing the Total Resource Cost test, Rate Impact Measure test, and Program Administrator Cost test. If this information was unavailable, RMI substituted the avoided costs of the IOU that each participant felt was most similar to their own POU.

POU and Ratepayer Real Discount Rates

The cost test calculations are based upon the net present value (NPV) of all future costs and benefits associated with each measure. To discount the future stream of avoided costs and customer rates, a separate discount rate was needed for the POU and for the customer. For instance, when calculating the total resource cost (TRC) test, the future avoided costs were discounted according to the POU's discount rate. When calculating the participant cost test (PCT), the future rates were discounted according to the customer's discount rate.

Each POU had the option of providing their own discount rate and specifying their customers' discount rate. If this data was not provided, RMI substituted a real utility discount rate of 5% and a real customer discount rate of 10%. The 10% customer discount rate reflects the fact that customers often require a faster payback than do utilities.

Non-Capital Program Costs, Including POU Incentives and Marketing/EM&V/Administrative,

Though the CEEPS report provided capital costs for each measure, each utility must specify their overhead costs. These costs are considered when determining cost-effective potential, as they are part of the TRC test. The RMI model calculates overhead as a function of the lifecycle energy savings for each measure. The lifecycle cost per kWh was initially determined based on each POU's historical performance, as was provided in the SB 1037 report. However, each POU has the option of choosing a different cost per lifecycle kWh if preferred. This topic is discussed further in section D, which covers the cost-test calculations.

Each utility can also specify to the degree to which they will provide rebates on efficiency measures. This incentive level is input as a percentage of the capital cost.

C. Technical Potential

The term technical potential is typically used to describe the full extent of efficiency potential, without regard to practicality or costs. In theory, the technical efficiency potential could reach 100% of baseline consumption, as it is technically possible to create buildings that do not use any electricity. The RMI technical potential model is based upon the technical potential calculated in the CEEPS report for the IOUs. The CEEPS measures represent the subset of measures that Itron deemed to be reasonable to include at the time of the study. The technical potential results therefore do not represent the maximum technical potential that is theoretically possible. It is also important to note that the technical, cost-effective, and feasible efficiency potential reported by the RMI models are net, based on the net-to-gross ratio reported by Itron for each measure.[7]

The structure of the technical potential outputs in the CEEPS report was somewhat different for each sector. Since each data set contained different data elements, the RMI model used a combination of methodologies to calculate technical potential for the various sectors. The potential for existing buildings and industrial new construction was modeled as a function of baseline sales. The potential for residential and commercial new construction was modeled as a function of forecasted new building space. RMI also developed a “high-tech” industrial module, which modeled efficiency as a function of baseline sales.

The following discussion is organized based upon the methodology employed. The residential and commercial sectors are described together, as the same methodology was used for both sectors. The industrial sector is described last, as a separate methodology was used for each portion—existing conventional, new conventional, and high-tech—of this sector.

I. Residential and Commercial

<u>Existing Buildings</u>

Technical Potential: Energy

The CEEPS report provided technical efficiency potential for individual efficiency measures for the PG&E service territory. This data set was used to develop a total generic, baseline technical potential. It is referred to as the Itron Study Baseline within the RMI technical potential model.

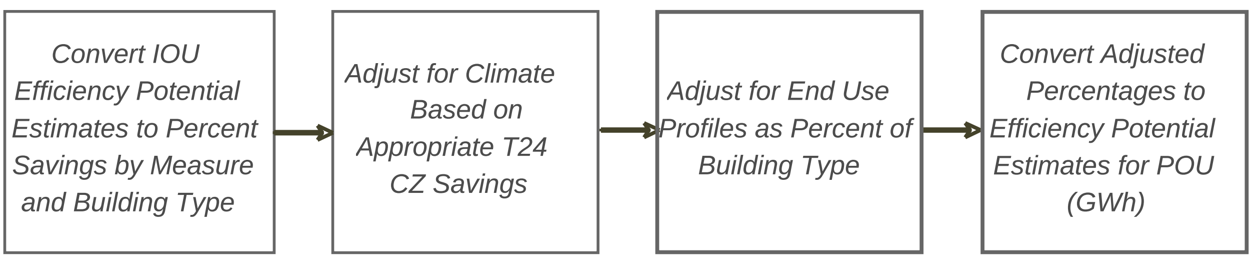
---

[7] Importantly, some of the assumptions built into the CEEPS data may overstate the technical potential. For example, some data sources are assumed to be front loaded (all installed in the first year), which add considerably to the year 10 cumulative total. In this case, re-adoption of the measure appeared to be presumed for short-lived measures along with continued counting of energy savings after the first life cycle.

The baseline technical potential was converted to a relative measure so that it could be applied to each POU's unique system. For each building type, RMI divided the baseline technical potential by the baseline sales for the corresponding building type to determine savings as a percentage of consumption. This baseline percentage potential was then adjusted for climate and end use differences between the baseline utility's customers and those of each participating POU. The climate adjustment was achieved by comparing per-unit energy savings for each POU's specific climate zone to the per-unit savings for the baseline utility, for each measure.[8]

For instance, due to climate differences that affect technology usage patterns, the per-unit savings for an air conditioner in a particularly hot climate zone may occasionally differ from the per-unit average savings for the baseline utility. The end use adjustment was achieved by comparing the relative end use composition for each POU to that of the baseline utility.[9] Once these adjustments were made, the percentage savings was multiplied by each POU's forecasted sales to the relevant building type to determine its technical potential. These steps are summarized in Figure 1.

Figure 1. Overview of Methodology for Technical Energy Savings Potential



Technical Potential: Demand

As in the energy potential analysis, the baseline technical demand potential was converted to a relative measure so that it could be applied to each POU's system. First, for each measure, the average kW saved per unit was divided by the kWh saved per unit.[10] The resultant kW per kWh saved was then multiplied

[8] A "unit" refers to a unit of a given efficiency measure (such as one light bulb or one square foot of attic insulation). The adjustment factor was calculated by dividing the per-unit savings for the appropriate climate zone by that of the baseline utility.

[9] Baseline residential characteristics are derived from Appendix H of the California Statewide Residential Sector Energy Efficiency Potential Study. Baseline commercial characteristics are derived from the California Commercial End-Use Survey, Table 9-2.

[10] Average kW saved per unit is calculated by dividing annual kWh savings per unit by 8760.

by each POU's technical energy savings potential to determine the average kW savings for each measure. The average kW savings was then multiplied by a peak factor[11] to determine peak reduction potential.

New Construction

Technical Potential: Energy

For new construction, the CEEPS report provided technical potential for packages of measures, rather than for individual technologies. The electricity savings potential per home (residential) or per square foot (commercial) was multiplied by the number of new homes or square feet forecasted, respectively, to be built in a given year. RMI derived this forecast of new homes and new commercial space by dividing the portion of annual load attributable to new construction by the average annual electricity consumption per home or square foot.[12] When the portion of load that is new construction was not provided specifically by the POU, RMI used a default assumption of 50 percent. The resultant annual electricity savings were then adjusted by comparing the relative annual energy consumed by HVAC and water heating for each POU to that of the baseline.

Technical Potential: Demand

To determine peak demand reduction potential, the average kW saved per home or per square foot of commercial space was first multiplied by the number of new homes or square feet forecasted, respectively, to be built in a given year. The resultant annual average kW savings were then adjusted by comparing the relative annual energy consumed by HVAC and water heating for each POU to that of the baseline. In the final step, the adjusted average kW savings were multiplied by a peak factor (provided in the CEEPS appendices for each building type) to determine peak reduction potential.

II. Industrial

The CEEPS report provided outputs for conventional industries. For existing facilities, the technical potential was reported at the end use level, rather than at the measure level. However, new construction results were provided at the measure level.

RMI also developed a separate module to forecast efficiency potential for both existing and new "high-tech" facilities, such as data centers, semiconductor

[11] Peak factors were determined by Itron in the CEEPS appendix as a ratio of peak demand impact to average demand impact. Peak factors varied by region.

[12] New construction is defined as all buildings constructed after 2006.

manufacturers, and labs. These facilities were not covered in the CEEPS report. This module was based upon a variety of sources, which are discussed in further detail later in this section.

The methodology for each portion of the industrial sector varied based upon the nature of the data available. The following discussion is therefore organized with a different section for each of the three modules in the technical potential model: existing conventional facilities, new conventional facilities, and high-tech facilities.

Conventional Industries: Existing Facilities

Technical Potential: Energy

For existing facilities, the CEEPS study only allowed for modeling of savings potential at the end use level, rather than at the measure level. Furthermore, climate adjustments were not possible, as savings potential was not available by climate zone. Otherwise, the method for estimating energy efficiency potential was the same as for residential and commercial existing construction. The baseline technical potential was converted to a relative measure so that it could be applied to each POU's system. This was done by dividing the baseline technical potential by baseline sales for the applicable industry to determine savings as a percentage of consumption for that industry. The model then adjusts for potential differences in end use consumption within each industry between the baseline utility's customers and those of each participating POU.[13] In the final step, the percentage savings is multiplied by each POU's forecasted sales to the relevant industry to determine its technical potential.

Technical Potential: Demand

As in the energy potential analysis, the baseline technical demand potential was converted to a relative measure so that it could be applied to each POU's system. First, the total average kW reduction potential was divided by the total kWh savings potential. The resultant kW per kWh saved was then multiplied by each POU's technical energy savings potential to determine average kW savings. Given the relatively constant usage patterns inherent in most industrial processes, the peak reduction was assumed to be the same as the average kW savings.

Conventional Industries: New Construction

The CEEPS report limited the scope of its new facilities analysis based on expected new construction patterns for the IOUs. For this study, only refrigerated warehouses and electronics facilities were modeled. Though new refrigerated warehouses were included in the CEEPS data set for industrial new construction, existing refrigerated warehouses were part of the CEEPS data set

[13] Baseline industrial characteristics were derived from the CEEPS file Industrial Outputs.xls.

for existing commercial buildings. For the sake of consistency, RMI grouped all of the refrigerated warehouse results (both existing and new facilities) in the commercial model outputs. Though it was necessary to model technical potential for new refrigerated warehouses together with new electronics facilities, new refrigerated warehouses were moved to the commercial calculations in the cost-effectiveness model.

Technical Potential: Energy

The CEEPS report provided energy savings potential on a relative basis (kW savings per MWh consumed) for each measure, thereby eliminating the need for the RMI model to calculate a relative savings potential. The model multiplied this value by the forecasted new construction energy consumption for each facility to determine technical energy savings potential for each measure.

Technical Potential: Demand

First, the average kW saved per MWh was divided by the kWh saved per MWh. The resultant kW per kWh saved was then multiplied by each POU's technical energy savings potential to determine average kW savings. The average kW savings was then multiplied by a peak factor (provided in the CEEPS appendices for each end use) to determine peak reduction potential.

<u>High-Tech Industries: Existing and New Facilities</u>

For the purposes of this analysis, high-tech industries include data centers, semiconductor manufacturers, and laboratories. The CEEPS report did not specifically address data centers or labs, and only specifically addressed semiconductor manufacturers for new construction. RMI therefore conducted supplemental analysis on high-tech efficiency measures and potential. This section summarizes that analysis.

Technical Potential: Energy

RMI's estimate of technical potential for high-tech industries was based on a number of sources, summarized in Table 5:

Table 5. Sources Used to Develop Potential Estimates for the High Tech Sector

Source	Data
Pacific Gas & Electric (PG&E) Design Guidelines Sourcebook (Rumsey Engineers)	Data Center efficiency measures
RMI personal conversation with Carl McDonnell at Silicon Valley Power	Data Center efficiency measures
CEEPS Industrial New Construction Methodology & Asset Inputs, Appendix Q	Semiconductor Manufacturer, Lab efficiency measures
Silicon Valley Power -commissioned energy audits	Semiconductor Manufacturer efficiency measures
EPA's 2003 "Laboratories for the 21st Century: Energy Analysis"	Lab baseline energy consumption breakdown
	Semiconductor baseline energy consumption breakdown
Lawrence Berkeley Lab's "Data Center Energy End Use Breakdown"	Data Center baseline energy consumption breakdown

Due to the lack of detailed and consistent source data regarding high-tech efficiency potential, RMI attempted to identify the subset of measures that: 1) affect the largest end-uses, or 2) are applicable to any type of industry (i.e., lighting retrofits), rather than developing a comprehensive list of measures.

For each measure identified, RMI used the sources listed in Table 5 to estimate the percent savings over baseline for each type of high-tech industry, for the particular end use affected by the measure. An estimate was then made of the applicability of each measure to the high-tech industry in question. That is, can the particular measure be installed at all customer sites within each category, or only a portion? Finally, additive potential was calculated for each end use. That is, care was taken to avoid double counting the impacts of partially redundant measures. These metrics were combined with the baseline energy consumption breakdown by end use to determine the total technical potential of each measure as a percent of total system consumption.

Finally, each measure was defined as retrofit, replace-on-burnout, or new construction measure. This determination was made based on the above source documents as well as RMI's past experience with high-tech industries.

Technical Potential: Demand

The source documents used to develop the estimates of energy efficiency potential do not, by and large, contain estimates of peak demand reductions in addition to energy reductions. Given the relatively flat usage patterns inherent in industrial processes, the peak reduction was assumed to be the same as the average kW savings.

D. Cost-Effective Potential

Utility analysts use a variety of tests to judge the effects of any particular utility program. Each of them is designed to identify the relative costs and benefits to a set of players involved in the transaction. For example, the participant cost test (PCT) is used to examine cost effectiveness from the perspective of utility efficiency program participants, while the rate impact measure (RIM) test examines the impact for all utility customers or ratepayers. RMI's efficiency model performs four cost tests for each measure under consideration. These tests are summarized in Table 6. The total resource cost (TRC) test was used to determine total cost-effective potential.

For the residential and commercial sectors, all measures were evaluated based on the ability of each measure to pass the TRC test. These calculations evaluated the total benefits and the total costs for the full life of each measure. The methodology for the industrial sector was altered slightly based upon the need to evaluate efficiency potential at the end-use level rather than the measure level. This is addressed in further detail in the Cost of Technology section. A discussion of the various components included in the four cost tests.

Table 6. Description of Cost Tests Used in the Cost Effectiveness Potential Model

Name of Test	What it Measures	Costs	Benefits
Participant Cost (PCT)	Are expenditures lowered for program participants?	Cost of technology, after incentives (rebates)	Bill savings
Program Administrator (Utility) Cost (PAC)	Are utility revenue requirements lowered?	Incentive paid to customer; marketing, EM&V, admin costs	Avoided energy and capacity costs
Rate Impact Measure (RIM)	Are utility rates lowered?	Incentive paid to customer; lost revenues; marketing, EM&V, admin costs	Avoided energy and capacity costs
Total Resource Cost (TRC)	Are total customer expenditures lowered?	Cost of technology; marketing, EM&V, admin costs	Avoided energy and capacity costs

<u>Avoided Energy Costs</u>

Each POU had the opportunity to use its own avoided energy costs. If this data was unavailable, RMI substituted the forecasted avoided energy costs for the IOU specified by each participant. The annual forecasted avoided costs from

2007-2026[14] were required for each time-of-use (TOU) period (e.g., summer peak, summer off-peak, summer partial peak, winter partial peak, winter off-peak). A weighted average avoided cost was developed for each year based upon the TOU load shape associated with the end use targeted by each measure.[15] After calculating the annual avoided cost associated with each measure, this stream of future costs was converted into a single "lifecycle" avoided cost over the life of the measure, based upon its net present value. This lifecycle avoided cost was then multiplied by the total kWh saved over the life of the measure to determine the total avoided energy costs over the life of the measure.

<u>Avoided Capacity Costs</u>

Each POU also had the opportunity to use its own avoided capacity costs. If POUs did not provide this information, the avoided capacity cost was entered as zero. Avoided capacity costs were embedded in the avoided energy costs for each proxy IOU.

The stream of future avoided capacity costs was converted into a single "lifecycle" avoided capacity cost, based upon its net present value. This lifecycle avoided cost was then multiplied by the measure's peak demand reduction potential to determine the total avoided capacity costs over the life of the measure.

<u>Bill Reduction</u>

The participating customer's bill reduction was determined using the forecasted rates for each of the three major customer classes – residential, commercial, and industrial. The calculations were used in the PCT and RIM. Residential rates were used to evaluate all residential measures, commercial rates were used to evaluate all commercial measures, and industrial rates were used to evaluate all industrial measures. The stream of future rates for the relevant customer class was converted into a single "lifecycle" rate, based upon its net present value. The customer discount rate was applied to PCT calculations, and the POU discount rate was applied to RIM calculations. This lifecycle rate was then multiplied by the total kWh saved over the life of the measure to determine the total bill reduction over the life of the measure. *This bill reduction is not a component of the TRC test and therefore does not affect the cost-effective efficiency potential.*

---

[14] The model uses avoided costs and customer rates for the next 20 years rather than just the 10-year study period. This is because each measure's cost-effectiveness if evaluated over the full life of the measure. The maximum measure life in this study is 20 years.

[15] A TOU load shape provides the percentage of annual energy consumption that occurs during each TOU period.

Measure Cost or Cost of Technology

Residential and Commercial

The cost of the technology or measure being considered, also known as the gross participant cost, represents the incremental capital cost of one unit of a given measure (i.e., a light bulb or a square foot of attic insulation).[16] These costs were included in the CEEPS appendices. New construction measures were bundled together as packages that save both electricity and natural gas. In these instances, entire packages – rather than individual measures – were evaluated using the cost test. To enable a fair evaluation of the cost to save electricity, the cost of the package was adjusted based upon the proportion of total BTUs saved that represents electricity savings.

Industrial

For industrial efficiency, additive technical potential was only available for entire end uses, rather than for specific measures within each end use.[17] The cost-effective potential was therefore also evaluated at an end-use level, rather than at the measure level. Furthermore, cost data for the industrial sector was only available on a levelized ($ per kWh saved) basis.[18] To determine the total incremental capital costs for each end use, the levelized costs were unlevelized. In other words, they were converted into net present value, assuming a 5% discount rate and a measure life of 20 years.

Incentive Paid to Customer

The incentive paid to the customer represents the rebate that the POU will provide to offset the cost of the technology. This value was applied to the PCT, PAC, and RIM calculations. RMI calculated the incentive as a percentage of the total technology cost. The default percentage was assumed to be 50% of the incremental technology cost, though the model allows users to alter this

[16] The cost of technology does not include direct installation costs.

[17] Non-additive potential reflects the potential savings of a measure when implemented in isolation. Given that measures are usually implemented in combination with several other measures, it is more accurate to evaluate the additive potential, which adjusts for interaction effects. While the CEEPS data provided additive potential at the measure level for the residential and commercial sectors, the industrial measure-level data was non-additive. However, the CEEPS data did provide additive potential for each industrial end use, and this data set was chosen to more accurately reflect the actual energy and demand savings potential.

[18] Levelized cost data was provided for each measure in the non-additive data set. A weighted average of the levelized costs of measures associated with each end use was calculated to determine a levelized cost for each industrial end use.

percentage if desired. *This rebate is not a component of the TRC test and therefore does not affect the cost-effective efficiency potential.*

Marketing, EM&V, and Administration Costs

Overhead devoted to efficiency programs can vary considerably by utility. For this model, the costs were calculated as a function of the total kWh saved over the life of the measure. The cost per lifecycle kWh was estimated initially by RMI based upon the total marketing, EM&V, and administration costs and the total lifecycle kWh saved as reported by each POU in the SB 1037 report.[19] The model allows users to alter this cost per lifecycle kWh if desired.

E. Feasible Potential

AB 2021 requires all POUs to acquire "all available energy efficiency and demand reduction resources that are cost-effective, reliable, and feasible." Given the diversity of the POU electric systems (including but not limited to: local demographics, age and condition of building stock, saturation of previously installed energy efficiency measures, economic growth, rate of expansion and new construction, and customer payback expectations), the implementation of all cost-effective measures identified in the RMI study would not be feasible or achievable. Therefore, each POU established feasible energy efficiency and demand reduction targets based on the results of the RMI study and local knowledge of their respective service areas.

Feasible Scenarios

To help utilities set feasible energy efficiency and demand reduction targets, RMI modeled the following scenarios:

- ***Scenario 1***—assumed that the historical incremental percent per year reduction in load is maintained over the study period. This scenario is considered to be the lower bound of feasible potential. This scenario is based upon the annual spending and savings reported for the fiscal year 2005-06 in the SB 1037 report. To determine future energy savings, the reported 2005-06 savings were first divided by the baseline annual consumption to determine the incremental percentage of total consumption saved per year. This percentage was then applied to the forecasted system consumption to determine annual energy savings.

[19] If this data was unavailable in the SB 1037 report, RMI applied the all-POU average of $0.01/lifecycle kWh. RMI capped values at $0.03. However, the final determination for this value was left to each POU.

- ***Scenario 2***—suggested a utility feasible percentage assuming that each POU could implement 50% of the total cost-effective measures identified in the cost-effective model.

- ***Scenario 3***–suggested a utility feasible percentage assuming that each POU could implement 80% of the total cost-effective measures identified in the cost-effective model.

<u>POU Specified Targets</u>

POUs were provided a number of options in setting annual energy efficiency targets, these included:

- **Option 1** – accept one of the targets developed by the RMI model described in Scenarios 1, 2, and 3 above.

- **Option 2** – adjust the unit inputs in the RMI model to arrive at a per measure potential, taking into consideration local market conditions (including known measure penetration levels). POUs following this option specified number of units of each measure that passed the TRC in the RMI model to arrive at a feasible quantity of measures installed per year. The POU-specified annual energy and demand savings are calculated by multiplying the feasible units by the per-unit energy or demand savings.

- **Option 3** – Set an annual target based on a combination of factors, including the RMI Scenario 1, 2, and 3 results, existing State energy efficiency goals, and POU knowledge of local markets and conditions. POUs following this option had concerns that while the RMI model may do a good job of applying the CEEPS market potential data to POU territories, the data and methodology is limited in its use for determining program-specific energy efficiency goals on the local level[20]. With this in mind, POUs following this option set reasonable, but aggressive program targets. These targets are based on local market knowledge and take into consideration existing cost-effective program offerings and previous program year successes, and how these offerings could be expanded and/or supplemented to meet targets.

The following list is illustrative of the types of adjustments that were made by POUs setting feasible targets using Option 2 or 3 above:

[20] We will not attempt to revisit all the methodology issues as they are well documented in Itron's presentations on April 20, 2007 to the CEC and on May 4, 2007 to the CPUC. However to summarize, market potential studies can only directly imply the relative market potential for energy efficiency. Identifying an energy efficiency program's potential requires further analysis to determine what savings potential can realistically be attributed to the program.

- The model favors the wide distribution of compact fluorescent lamps (CFLs) because of their cost-effectiveness and ease of installation; however, many POUs have already deployed a substantial number of CFLs within their service territories, and the number of additional CFLs recommended in the RMI model would not be feasible in some areas.
- Non-summer peaking utilities (generally along the coastal areas) needed to adjust for model bias towards reducing summer peak. Typically this involved adjusting the potential downward for air conditioning measures.
- Measure potential was assessed against recent program performance and adjusted to accurately reflect the potential that has already been realized.
- The model favors pool pump measures and needed some adjustments to accurately reflect the territory baseline stock and potential.
- Certain measures identified in the cost effective potential have relatively poor chance of being installed due to regional-specific barriers to implementation. Adjustments were made to accurately reflect each measure's true potential, based on the expertise of utility program staff.
- Lack of industrial diversity (or relatively few industrial customers) for many POUs creates significant barriers to further penetrating the industrial market beyond what has already been accomplished.
- Cost-effective potential includes measures with high local market penetration rates. Some POUs assert that these measures should not be subsidized through utility program interventions. While the measure potential exists within the utility service territory, ultimate savings are not necessarily attributed to the program and therefore removed from some utility-specified program potential estimates.
- Economic considerations (recession, expansion, homogeneousness, etc) were taken into account and adjusted for as needed.

III. Energy Efficiency and Demand Reduction Targets

This section provides energy efficiency and demand reduction targets by specific utility. As shown in Table 7, the 35 POUs in this study expect to reduce their annual consumption of electricity by approximately 2,089 gigawatt hours over the ten-year period ending in 2016. This represents a savings of nearly eight percent over the period.

Table 7. Energy Efficiency Targets by POU 2007-2016

Publicly Owned Utility	Cumulative Energy Reduction Targets (MWh)										10-yr Total Energy Reduction Target (MWh)	10-yr Total Forecasted Electrical Consumption (MWh)	Average Annual Energy Reduction Target (%/yr)
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016			
Alameda	760	1,521	2,281	3,042	3,802	4,563	5,323	6,084	6,844	7,605	7,605	4,440,700	**0.17%**
Anaheim	15,897	32,014	48,247	64,839	81,514	98,470	115,562	132,722	149,952	167,682	167,682	27,814,949	**0.60%**
Azusa	2,084	4,168	6,252	8,336	10,420	12,504	14,588	16,672	18,756	20,840	20,840	2,729,194	**0.76%**
Banning	873	1,747	2,620	3,494	4,367	5,240	6,114	6,987	7,861	8,734	8,734	1,810,995	**0.48%**
Biggs	106	213	319	425	532	638	744	850	957	1,063	1,063	180,385	**0.59%**
Burbank	11,307	22,615	33,922	45,229	56,536	67,844	79,151	90,458	101,765	113,073	113,073	11,862,716	**0.95%**
Colton	2,625	5,251	7,876	10,501	13,127	15,752	18,378	21,003	23,628	26,254	26,254	4,293,194	**0.61%**
Corona	467	934	1,401	1,867	2,334	2,801	3,268	3,735	4,202	4,669	4,669	783,530	**0.60%**
Glendale	11,362	22,724	34,086	45,448	56,810	68,172	79,534	90,896	102,258	113,620	113,620	11,380,875	**1.00%**
Gridley	92	183	275	367	459	550	642	734	825	917	917	436,246	**0.21%**
Healdsburg	198	397	595	794	992	1,190	1,389	1,587	1,786	1,984	1,984	817,691	**0.24%**
Hercules	136	273	409	546	682	818	955	1,091	1,228	1,364	1,364	173,632	**0.79%**
IID *	45,067	90,133	135,200	180,266	225,333	270,400	315,466	360,533	405,600	450,666	450,666	41,869,219	**1.08%**
Industry	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LMUD	733	1,467	2,200	2,933	3,666	4,400	5,133	5,866	6,600	7,333	7,333	1,562,046	**0.47%**
Lodi	2,000	4,000	6,000	8,001	10,001	12,001	14,001	16,001	18,001	20,001	20,001	5,162,129	**0.39%**
Lompoc	1,121	2,242	3,363	4,484	5,605	6,726	7,847	8,968	10,089	11,210	11,210	1,485,125	**0.75%**
Merced	3,619	7,239	10,858	14,478	18,097	21,717	25,336	28,956	32,575	36,195	36,195	4,932,128	**0.73%**
MID	13,856	27,711	41,567	55,423	69,279	83,134	96,990	110,846	124,702	138,557	138,557	30,943,438	**0.45%**
Moreno Valley	822	1,644	2,466	3,289	4,111	4,933	5,755	6,577	7,399	8,221	8,221	741,070	**1.11%**
Needles	817	1,635	2,452	3,269	4,086	4,904	5,721	6,538	7,356	8,173	8,173	726,509	**1.12%**
Pasadena	5,000	15,000	28,500	45,500	68,127	90,753	113,380	136,006	158,633	181,260	181,260	13,661,510	**1.33%**
Pittsburgh Power/ Island Energy	178	355	533	711	888	1,066	1,244	1,421	1,599	1,777	1,777	195,394	**0.91%**
Port of Oakland	884	1,767	2,651	3,535	4,418	5,302	6,186	7,070	7,953	8,837	8,837	946,210	**0.93%**
Plumas Sierra	621	1,242	1,863	2,483	3,104	3,725	4,346	4,967	5,588	6,209	6,209	1,871,636	**0.33%**
Rancho Cucamonga	448	896	1,343	1,791	2,239	2,687	3,135	3,582	4,030	4,478	4,478	751,700	**0.60%**
Riverside	22,210	44,850	67,910	91,320	115,170	139,420	164,040	189,060	214,510	240,380	240,380	24,038,000	**1.00%**
Roseville	8,716	17,432	26,149	34,865	43,581	52,297	61,014	69,730	78,446	87,162	87,162	14,182,047	**0.61%**
Silicon Valley Power	25,762	51,524	77,286	103,048	128,810	154,572	180,334	206,096	231,858	257,620	257,620	31,309,698	**0.82%**
Shasta Lake	129	258	388	517	646	775	905	1,034	1,163	1,292	1,292	787,736	**0.16%**
Truckee Donner	1,001	2,003	3,004	4,005	5,007	6,008	7,009	8,011	9,012	10,014	10,014	1,691,601	**0.59%**
TID	7,824	15,095	26,287	53,177	80,686	102,028	116,458	124,206	132,045	139,990	139,990	21,594,025	**0.65%**
Trinity	0	0	0	0	0	0	0	0	0	0	0	1,008,289	**0.00%**
Ukiah	198	396	594	792	990	1,188	1,386	1,584	1,781	1,979	1,979	1,270,214	**0.16%**
Vernon	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	**186,916**	**378,928**	**578,898**	**798,775**	**1,025,420**	**1,246,579**	**1,461,332**	**1,669,872**	**1,879,003**	**2,089,159**	**2,089,159**	**267,453,831**	**0.78%**

* Imperial figures are for 2008 through 2017

Using a slightly different metric for evaluation, the savings noted in Table 7 account for a significant reduction in load growth among the utilities participating in this analysis. Roughly one half of load over the next ten years is expected to be offset through via implementation of energy efficiency measures. In some instances, it is anticipated that all load growth will be met via energy efficiency.

Table 8 takes a slightly different perspective, analyzing the extent to which peak demand can be reduced via utility energy efficiency programs. From this analysis, the 35 POUs participating in this project estimate a peak demand savings of 274 megawatts over the ten-year period, a reduction of roughly four percent, compared to peak demand in the absence of such programs.

Table 8. Energy Efficiency Demand Reduction Targets by POU 2007-2016

Publicly Owned Utility	Cumulative Demand Reduction Targets (MW)										Total Demand Reduction Target (MW)	Average Forecasted Demand (MW)	Average Annual Demand Reduction Target (% / yr)
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016			
Alameda	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	0.9	76	**0.12%**
Anaheim	3.3	6.7	10.1	13.6	17.1	20.6	24.3	27.9	31.5	35.2	35.2	584	**0.60%**
Azusa	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	2.4	2.4	68	**0.35%**
Banning	0.1	0.2	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.2	56	**0.22%**
Biggs	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	4	**0.36%**
Burbank	2.4	4.7	7.1	9.5	11.9	14.4	16.8	19.3	21.7	24.2	24.2	303	**0.80%**
Colton	0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	2.8	2.8	103	**0.27%**
Corona	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6	16	**0.36%**
Glendale	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13.0	13.0	336	**0.39%**
Gridley	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	14	**0.08%**
Healdsburg	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	22	**0.10%**
Hercules	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	3	**0.58%**
IID *	6.1	12.2	18.3	24.4	30.5	36.6	42.7	48.8	55.0	61.1	61.1	1,207	**0.51%**
Industry	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LMUD	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9	28	**0.33%**
Lodi	0.2	0.5	0.7	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.5	146	**0.17%**
Lompoc	0.1	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.3	27	**0.47%**
Merced	0.4	0.9	1.3	1.8	2.2	2.7	3.1	3.6	4.0	4.5	4.5	99	**0.45%**
MID	1.6	3.2	4.8	6.3	7.9	9.5	11.1	12.7	14.3	15.9	15.9	797	**0.20%**
Moreno Valley	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.1	26	**0.40%**
Needles	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.2	23	**0.52%**
Pasadena	0.6	1.8	3.4	5.5	8.2	10.9	13.6	16.3	19.0	21.7	21.7	321	**0.68%**
Pittsburgh Power/ Island Energy	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	5	**0.64%**
Port of Oakland	0.1	0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.1	1.1	15	**0.73%**
Plumas Sierra	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7	33	**0.22%**
Rancho Cucamonga	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	16	**0.36%**
Riverside	2.2	4.5	6.7	8.9	11.1	13.4	15.6	17.8	20.0	22.3	22.3	609	**0.37%**
Roseville	1.1	2.1	3.2	4.2	5.3	6.3	7.4	8.4	9.5	10.5	10.5	371	**0.28%**
Silicon Valley Power	3.0	6.0	8.9	11.9	14.9	17.9	20.9	23.9	26.8	29.8	29.8	509	**0.59%**
Shasta Lake	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	19	**0.08%**
Truckee Donner	0.1	0.2	0.3	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.1	41	**0.28%**
TID	1.0	2.0	3.0	6.0	9.0	12.0	14.0	15.0	15.0	16.0	16.0	523	**0.31%**
Trinity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	**0.00%**
Ukiah	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	39	**0.05%**
Vernon	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	**25.0**	**50.6**	**76.6**	**105.2**	**134.5**	**163.9**	**192.3**	**219.8**	**246.3**	**273.8**	**273.8**	**6458**	**0.42%**

* Imperial figures are for 2008 through 2017

IV: Conclusion

CMUA views this report as the beginning of an important dialogue to assist state policymakers in developing a reliable assessment of energy efficiency throughout the state. With this report, CMUA and its public power partners believe a realistic assessment of energy efficiency potential moves the debate in the appropriate direction. That being said, there are numerous issues that are currently being addressed not only within the public power community, but also at the CPUC and the CEC that deserve more discussion.

Many of these considerations will have a critical impact on the development of targets beyond 2007. From a public power perspective, state policymakers may want to consider developing additional tools that will enhance the reliability of future forecasts. These tools should take into account a variety of factors:

- Previous market potential estimates (for upper boundary limits),
- Actual performance of programs,
- Lessons learned while utilities ramp up programs to reach targets,
- Lessons learned from IOU efforts,
- Potential for new and emerging technologies not previously identified,
- Code changes and their effects on program targets.

As vertically integrated utilities, consideration should be given to the overall energy efficiency performance of POUs. When operational improvements on the distribution side are considered, the energy savings potential is greatly increased. We continue to recommend that all energy efficiency savings, both demand and supply, be reported and tracked toward meeting statewide goals for energy efficiency.

As noted earlier, with the exception of Silicon Valley Power, which has already adopted its efficiency targets, the estimates provided by each utility are preliminary in nature and will be finalized by each utility’s local governing board during the next three months. We look forward to discussing these results in more detail at CEC workshops scheduled for August 9 and 27, respectively.

Appendix A:

Individual Utility Data Sets

Pasadena Water & Power

			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Technical Energy Efficiency Potential	Energy (MWh)	**System Total**	**149,475**	**163,254**	**176,618**	**186,557**	**196,937**	**208,134**	**217,905**	**229,109**	**239,207**	**250,161**
		Residential	63,956	70,095	74,412	77,892	81,265	84,776	88,105	91,735	95,051	101,124
		Commercial	85,519	93,160	102,206	108,664	115,672	123,358	129,800	137,374	144,156	149,037
		Conventional Industrial	0	0	0	0	0	0	0	0	0	0
		Data Centers	0	0	0	0	0	0	0	0	0	0
		Semiconductor Manufacturers	0	0	0	0	0	0	0	0	0	0
		Labs	0	0	0	0	0	0	0	0	0	0
	Demand (MW)	**System Total**	**20**	**22**	**24**	**25**	**27**	**28**	**30**	**31**	**33**	**34**
		Residential	8	9	9	10	10	11	11	12	12	13
		Commercial	12	13	14	15	16	17	18	19	20	21
		Conventional Industrial	0	0	0	0	0	0	0	0	0	0
		Data Centers	0	0	0	0	0	0	0	0	0	0
		Semiconductor Manufacturers	0	0	0	0	0	0	0	0	0	0
		Labs	0	0	0	0	0	0	0	0	0	0
Cost-Effective Energy Efficiency Potential	Energy (MWh)	**System Total**	**113,210**	**122,260**	**130,670**	**137,533**	**144,575**	**152,051**	**158,662**	**166,143**	**172,725**	**181,260**
		Residential	51,066	55,451	58,319	60,631	62,848	65,136	67,250	69,558	71,629	76,491
		Commercial	62,144	66,809	72,351	76,901	81,727	86,915	91,412	96,585	101,096	104,769
		Conventional Industrial	0	0	0	0	0	0	0	0	0	0
		Data Centers	0	0	0	0	0	0	0	0	0	0
		Semiconductor Manufacturers	0	0	0	0	0	0	0	0	0	0
		Labs	0	0	0	0	0	0	0	0	0	0
	Demand (MW)	**System Total**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
		Residential	5	6	6	6	7	7	7	7	8	8
		Commercial	8	9	9	10	11	11	12	13	13	14
		Conventional Industrial	0	0	0	0	0	0	0	0	0	0
		Data Centers	0	0	0	0	0	0	0	0	0	0
		Semiconductor Manufacturers	0	0	0	0	0	0	0	0	0	0
		Labs	0	0	0	0	0	0	0	0	0	0
Feasible Targets	Energy (MWh)	System Total	5,000	15,000	28,500	45,500	68,127	90,753	113,380	136,006	158,633	181,260
	Demand (MW)	System Total	0.6	1.8	3.4	5.5	8.2	10.9	13.6	16.3	19.0	21.7
Impact on Forecasted Consumption and Demand	Energy (MWh)	**Baseline Energy Forecast**	**1,273,050**	**1,290,090**	**1,313,050**	**1,334,050**	**1,356,050**	**1,381,030**	**1,399,040**	**1,423,030**	**1,440,080**	**1,452,040**
		After Feasible Targets	1,268,050	1,275,090	1,284,550	1,288,550	1,287,923	1,290,277	1,285,660	1,287,024	1,281,447	1,270,780
		After All Cost-Effective	1,159,840	1,167,830	1,182,380	1,196,517	1,211,475	1,228,979	1,240,378	1,256,887	1,267,355	1,270,780
		After Technical	1,123,575	1,126,836	1,136,432	1,147,493	1,159,113	1,172,896	1,181,135	1,193,921	1,200,873	1,201,879
	Demand (MW)	**Baseline Demand Forecast**	**307**	**310**	**313**	**316**	**319**	**322**	**325**	**329**	**332**	**335**
		After Feasible Targets	306	308	310	311	311	311	311	313	313	313
		After All Cost-Effective	294	296	298	300	302	304	306	309	311	313
		After Technical	287	288	289	291	292	294	295	298	299	301

Average Annual Impact on Forecasted Consumption and Demand	Energy (MWh)	Average Annual Technical Potential	1.83%
		Average Annual Cost-Effective Potential	1.33%
		Average Annual Feasible Targets	1.33%
	Demand (MW)	Average Annual Technical Potential	1.07%
		Average Annual Cost-Effective Potential	0.68%
		Average Annual Feasible Targets	0.68%

RMI Model Input Parameters for Pasadena Water and Power

1 Proxy Data: SCE

2 Climate Zone: 9

3 Energy Efficiency Program Administration Cost
15% of total efficiency expenditures

4 Real Discount Rate (%):
Utility: 8%
Ratepayers: N/A

5 Amortization Period for Efficiency Measures: 20 years

Monthly Loads – Calendar 2006*

Month	Residential	Commercial (Small Commer-cial)	Industrial (Med Commer-cial)	Wholesale (Large Commer-cial)	Other (Street Lighting)	System Total	System Peak Demand
	MWh	MWh	MWh	MWh	MWh	MWh	MW
January	29,187	14,148	20,501	33,052	1,366	98,254	183
February	23,720	10,350	20,190	35,635	1,366	91,261	186
March	27,453	13,578	19,729	37,161	1,317	99,238	176
April	22,299	10,112	19,438	34,848	1,366	88,063	176
May	25,429	13,574	20,593	32,436	1,366	93,398	203
June	21,827	11,689	23,931	37,767	1,366	96,579	285
July	34,524	17,181	26,928	41,022	1,366	121,021	316
August	34,525	14,245	27,897	41,625	1,366	119,658	279
September	40,776	18,440	24,667	43,501	1,366	128,750	316
October	26,708	12,498	23,405	42,990	1,366	106,967	208
November	27,422	14,411	20,241	35,243	1,366	98,683	213
December	22,128	10,812	19,626	34,158	1,370	88,093	181
Total	**335,998**	**161,038**	**267,145**	**449,437**	**16,345**	**1,229,962**	**316**

* Annual forecasts for 2007-2016 are scaled according to these values.

RMI Model Input Parameters for Pasadena Water and Power

RMI Southern California Edison Default Avoided Costs ($/kWh)

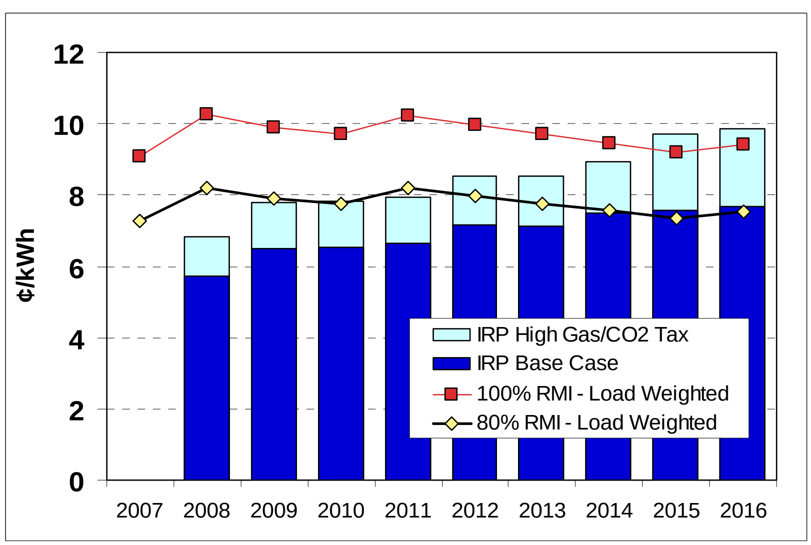
Fiscal Year*	*Level***	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Summer On-Peak	0.159	0.151	0.169	0.163	0.159	0.168	0.163	0.158	0.154	0.149	0.153
Summer Par-Peak	0.105	0.098	0.111	0.107	0.105	0.110	0.107	0.105	0.102	0.099	0.101
Summer Off-Peak	0.072	0.068	0.076	0.074	0.072	0.076	0.074	0.072	0.071	0.069	0.070
Winter Par-Peak	0.104	0.097	0.110	0.106	0.104	0.110	0.107	0.104	0.101	0.099	0.101
Winter Off-Peak	0.074	0.069	0.078	0.076	0.074	0.078	0.076	0.074	0.072	0.070	0.072
Annual Flat Average (7x24)	0.089	0.083	0.094	0.091	0.089	0.094	0.092	0.089	0.087	0.084	0.086
Load-Weighted Annual Average	0.097	0.091	0.103	0.099	0.097	0.102	0.100	0.097	0.094	0.092	0.094

PWP Selected Avoided Costs ($/kWh)
(SCE Default x 80%)

Fiscal Year*	*Level***	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Summer On-Peak	0.127	0.121	0.135	0.130	0.127	0.134	0.130	0.127	0.123	0.120	0.122
Summer Par-Peak	0.084	0.078	0.088	0.085	0.084	0.088	0.086	0.084	0.081	0.079	0.081
Summer Off-Peak	0.058	0.054	0.061	0.059	0.058	0.061	0.059	0.058	0.056	0.055	0.056
Winter Par-Peak	0.083	0.078	0.088	0.085	0.083	0.088	0.086	0.083	0.081	0.079	0.081
Winter Off-Peak	0.059	0.055	0.063	0.061	0.059	0.063	0.061	0.059	0.058	0.056	0.058
Annual Flat Average (7x24)	0.071	0.067	0.075	0.073	0.071	0.075	0.073	0.071	0.069	0.068	0.069
Load-Weighted Annual Average	0.078	0.073	0.082	0.079	0.078	0.082	0.080	0.078	0.076	0.073	0.075

* Calendar year avoided cost data were used for corresponding fiscal year ending June 30
** Levilized 10-year avoided cost at 6% discount rate

Alternative Avoided Costs
The graph to right compares the annual load-weighted average avoided costs from the RMI EE potential study (lines) with values derived from PWP's Draft 2007 Integrated Resource Plan study, shown as bars.

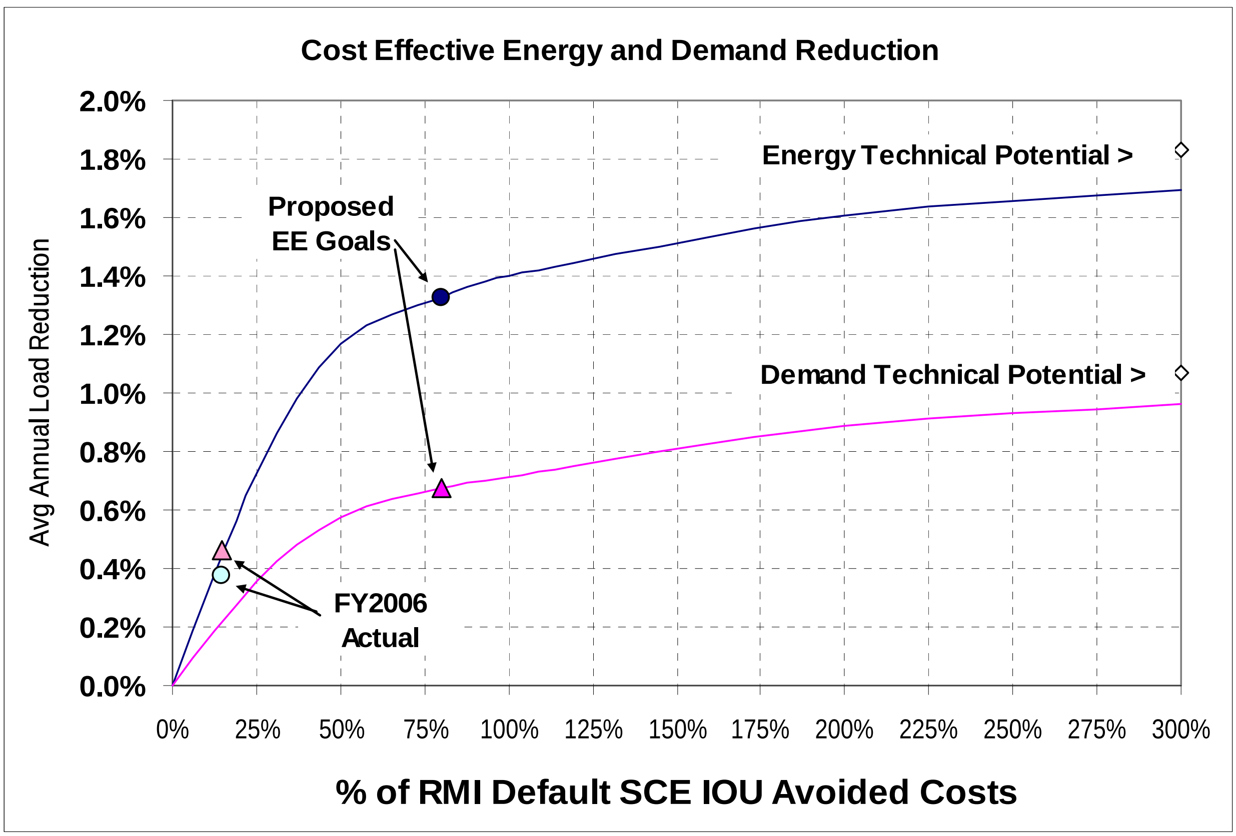


RMI Model Results for Pasadena Water and Power

Sensitivity to Avoided Costs

The graph below shows the indicated average annual cost effective energy savings and demand reduction as a function of the avoided cost input assumptions. Energy savings results are depicted as a blue line with circles for 2006 actual and proposed 2017 goals. Demand reduction results are depicted as a magenta line with triangles for 2006 actual and proposed 2017 goals for energy efficiency program results.

For comparison, the Technical Potential for energy savings and demand reduction without regard to cost is shown on the right side of the scale.



Attachment 4

Natural Resources Defense Council

Analysis of California's Publicly-Owned Utilities' Draft Ten-Year Energy Efficiency Targets

This page intentionally left blank

NATURAL RESOURCES DEFENSE COUNCIL

Analysis of California's Publicly-Owned Utilities' Draft Ten-Year Energy Efficiency Targets

Devra Wang & Eric Wanless, Natural Resources Defense Council (NRDC)
September 4, 2007

This memo presents NRDC's initial analysis of the publicly-owned utilities' (POU) draft ten-year energy saving targets submitted to the California Energy Commission (CEC) pursuant to AB 2021 (Levine, 2006). At the end of June 2007, thirty-three POUs submitted a joint report under the auspices of the California Municipal Utilities Association (CMUA), *Establishing Energy Efficiency Targets: A Public Power Response to AB 2021* ("CMUA Report"), presenting their preliminary energy saving targets to the CEC based on a potential study conducted by the Rocky Mountain Institute (RMI). The Los Angeles Department of Water and Power (LADWP), Sacramento Municipal Utility District (SMUD), City of Palo Alto Utilities, and Redding Electric Utility submitted information to the CEC separately.[1]

Many of the POUs' targets are preliminary and have not yet been adopted by their governing boards; the POUs state that they plan to submit a final report, with formally adopted targets, by the first week of October.[2] The analysis presented in this memo is based on information in the CMUA Report and the other POUs' filings to the CEC, as well as additional information provided to us by the Northern California Power Agency (NCPA), which coordinated the development of the CMUA Report. *NRDC continues to work with NCPA to better understand the factors the POUs used to set their targets and to fill some of the information gaps identified below.*

Our preliminary analysis shows that the draft targets proposed by many of the POUs are reasonable and meet AB 2021's requirement to set targets to capture all energy efficiency savings that are "cost effective, reliable, and feasible." NRDC commends the POUs overall for the significant increase in energy savings that their draft targets represent, and we would welcome the opportunity to collaborate with the POUs to help them achieve the targets.

---

[1] LADWP targets were obtained from Cynthia Rogers of the California Energy Commission in a personal email communication, August 13, 2007; SMUD targets were obtained from Jim Parks of SMUD in a personal communication, July 31, 2007; the City of Palo Alto targets were obtained from Karl Knapp of Palo Alto Utilities, July 31, 2007; Redding Electric Utility targets are from: Nexant, *Redding Electric Potential Study,* 2007.
[2] CMUA Report, p. 5.

I. Summary of the POUs' Draft Targets

The POUs' draft targets, in aggregate, represent more than a ***tripling*** of average annual energy savings (a 253% increase) compared to 2006 reported energy savings. To meet the targets, POUs will need to significantly ramp up their energy efficiency programs.

In aggregate, the POUs' draft targets represent savings of nearly 6,000 GWh and over 1,200 MW by 2016, equivalent to 2 giant power plants. These savings will cut global warming pollution by at least 2.2 million tons of CO_2 by 2016,[3] equivalent to the pollution from more than 400,000 cars and trucks.[4] Meeting the targets will save the POUs' customers an estimated $2 billion on their energy bills over the next ten years.[5] See Attachment A for more detail on the POUs' draft energy saving targets.

II. Summary of NRDC's Recommendations to the CEC

Pursuant to AB 2021, the CEC is required to analyze the POUs' targets to determine if "improvements can be made in [ ] the level of a local publicly owned electric utility's annual targets to achieve all cost-effective, reliable, and feasible energy savings and demand reductions," and to provide recommendations on those improvements to the POU, the Legislature and the Governor. (Public Utilities Code Section 9615(f)) The CEC is also required to adopt a statewide energy saving target.

NRDC's primary recommendations to the CEC, based on our analysis described in more detail below and our prior comments to the CEC, are summarized in this section.

A. In reviewing the POUs' targets, NRDC urges the Commission to:

- **Commend** the following utilities, listed in alphabetical order, which rank among the top ten utilities with the most aggressive energy saving targets in at least two of the three comparisons we evaluated: **Burbank, Corona, Glendale, Hercules, Imperial Irrigation District, Island Energy, LADWP, Needles, Port of Oakland, Pasadena, Riverside, and SMUD.**

---

[3] This is a *conservative* estimate, not accounting for T&D losses and assuming that electricity savings avoid new natural gas baseload (combined cycle) plants with a heat rate of 7,100 Btu / kWh, consistent with the CEC's report on the cost of new California generating technologies. (Source: California Energy Commission's Staff Report, "Comparative Cost of California Central Station Electricity Generation Technologies," August 2003, http://www.energy.ca.gov/reports/2003-08-08_100-03-001.PDF). The emissions factor for natural gas, according to EIA is 14.45 million metric tons of carbon per quadrillion Btu. (Equivalent to 1445 metric tons of carbon per million therms, or 5298 metric tons of CO2 per million therms.) (Source: Energy Information Administration, "Emissions of Greenhouse Gases in the United States 1987-1992," DOE/EIA-0573 (Washington, DC, November 1994), Appendix A, pp. 73-92, www.eia.doe.gov/oiaf/1605/87-92rpt/appa.html). The corresponding electric emission rate, using this heat rate and emissions factor, is 376 metric tons CO2 / GWh.

[4] Conversion factor from California Air Resources Board, *Conversion of 1 MMT CO_2 to Familiar Equivalents,* September 25, 2006, www.arb.ca.gov/cc/factsheets/1mmtconversion.pdf.

[5] Assumes that the POUs will deliver savings at least as cost-effectively as the IOUs. Cost estimates for the electric efficiency programs are $259 invested per first year MWh saved, based on the average of IOU investments and first year savings from 1998 to 2005. Assumes that the programs would deliver a ratio of 1.4 net benefits to program costs, or more than $2 saved for every $1 invested, which is the average for the IOUs from 1998 to 2005.

- ♦ **Evaluate further** the following utilities' targets to understand the rationale behind their targets and to determine whether they meet the law's requirement to "identify all potentially achievable cost-effective" savings and to "acquire all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible." (Public Utilities Code Section 9615). These utilities, listed in alphabetical order, rank among utilities with the lowest energy saving targets in at least two of the three comparisons we evaluated: **Alameda, Gridley, Healdsburg, Plumas Sierra, Shasta Lake, Trinity, Ukiah, and Vernon**. *While some of these utilities may have legitimate reasons for their comparatively low energy saving targets* (for example, Alameda states that because of its climate and customer base many of the top measures in the RMI model do not apply), *they have not presented sufficient information to allow us to make that determination* and we urge the Commission to pay particular attention to whether these utilities' targets are sufficiently aggressive to meet the law's requirement.
- ♦ **Require any POU that changed RMI's default assumptions to submit the actual input assumptions** that they used, in particular for their avoided costs and discount rates, and the basis for their assumptions.
- ♦ In particular, require the following POUs, which chose to set a target of significantly less than 50% of the economic potential identified by RMI ("Option 1, Scenario 2"), to **document the specific changes, and the rationale for those changes**, that were made by each utility to the RMI analysis in setting their targets: **Alameda, Banning, Biggs, Colton, Gridley, Healdsburg, Lassen, Lodi, Plumas Sierra, Shasta Lake, Trinity, Ukiah, and Vernon.**
- ♦ **Recommend that these same 13 POUs** that proposed targets less than 50% of the economic potential **adopt targets of 50% of economic potential or 1% annual energy savings as a percent of sales, unless the CEC determines that the POU had a reasonable basis for setting lower targets.**
- ♦ **Evaluate the ramp-up rate for each POU's target to determine if it is achievable and sustainable.** Where necessary to ensure sustained success, recommend that the POU use a more reasonable ramp-up rate at the beginning of the ten year period and a more aggressive ramp rate in later years.

B. **We urge the CEC to set a statewide energy saving target based on the sum of the IOU and POU targets**, using a target of 50% of economic potential or 1% annual energy savings as a percent of sales for each of the POUs that proposed targets lower than 50% of economic potential, *unless the Commission determines that the POU had a reasonable basis for setting lower targets*. In future years, it may be appropriate for the Commission to set an even more aggressive energy saving target, but right now the POUs' programs need time to ramp up in order to be sustainable, so we believe this statewide target is reasonable at this time.

C. For future POU target-setting processes, we urge the Commission to:

- ♦ Recommend that the POUs conduct **a more rigorous assessment of the feasible potential** when they update their targets in three years, and require that the POUs provide detail on their methodology for determining feasible potential as part of AB 2021's requirement that the POUs provide the Commission with the "basis for establishing [their] targets."

- ♦ **Provide clear guidance for improvements to the next potential study** the POUs conduct. There are numerous decisions utilities will make about the analytical framework and input assumptions used to develop their energy efficiency potentials and targets. The Commission should clearly delineate its expectations that the:
  - **cost-effectiveness test** should be the Total Resource Cost (TRC) test;
  - energy efficiency **measure savings and unit costs** should be based on either an existing credible resource such as the Database for Energy Efficiency Resources or other reasonable, documented, assumptions;
  - **avoided costs** should include all cost elements including generation, transmission, distribution, and environmental costs, and should reflect the time-varying value of savings;
  - **discount rate** should be a societal discount rate of 3% real, consistent with the discount rate used by the Commission in evaluating energy efficiency standards, and in no case should be greater than the utility's weighted average cost of capital; and
  - report should include an estimate of the **total net economic benefits** (calculated using the TRC framework) for each utility from achieving the targets.

D. For future POU annual reports, we urge the Commission to:

- ♦ **Provide clear guidance for improvements to the POUs' next annual report** on energy efficiency program achievements, pursuant to SB 1037 and AB 2021, including:
  - Provide **additional metrics**, including total net benefits for each utility, annual savings as a percent of target, annual energy savings as a percent of sales, and annual investments as a percent of revenues;
  - **supply-side energy efficiency savings should be reported separately** from demand-side efficiency savings, and should not be included in a comparison of actual savings compared to targets; and
  - **no generation from renewable energy**, including solar programs, should be reported as part of the end-use efficiency savings.
- ♦ Provide clear guidance to the POUs on **what constitutes independent evaluation** of the energy savings that will be reported in future annual reports.
- ♦ Require that each POU respond to the following questions in future annual reports to **determine whether the POUs are treating investments in efficiency as procurement investments** as required by AB 2021:
  - How is energy efficiency accounted for in long-term procurement plans or integrated resource plans?
  - How is energy efficiency accounted for in decisions to make new long-term commitments to supply-side resources?
  - What mechanisms are used to recover the costs of the efficiency programs? What percent of efficiency program funding comes from procurement budgets?
  - What percent of total utility revenues, and what total amount in dollars, is invested in "public benefits programs" pursuant to Public Utilities Code section 399.8(b)(2)?
  - What portion of the public benefits fund is invested in: energy efficiency, low-income assistance, renewable energy, and RD&D?

- What percent of energy efficiency funding is from the public benefits fund and what percent is from other sources?
- Are investments in efficiency recovered in the same manner as procurement investments?

E. NRDC recommends that the Commission work with the POUs to help them succeed. We urge the CEC to assist the POUs in ramping up their programs and achieving their targets. For example, the Commission could provide technical assistance to the POUs in:
  - Energy efficiency program and portfolio design
  - Revising ratemaking processes to remove financial impediments
  - Future potential studies
  - Program tracking and quality control
  - Impact and process evaluation design and contracting

III. Assessment of the POUs' Draft Targets

In aggregate, the POUs' targets appear to be strong, though not as aggressive as the IOU targets (assuming the CPUC's targets for 2014-2016 are at least as aggressive as those for 2013). The POUs' targets will reduce forecast energy consumption in 2016 by 8%, whereas the IOUs' likely targets will reduce forecast consumption by 12%.

The POUs' draft targets would achieve average annual energy savings of 0.9% of consumption, in aggregate. In comparison, the IOUs' would achieve average annual energy savings of 1.2% of consumption. This would place California's utilities in the range of the best states nationally. According to the most recent data compiled by the American Council for an Energy Efficient Economy in 2004, other states' energy efficiency efforts deliver annual savings ranging from about 0.1% to 0.8% of sales.[6] However, a few other states have now set even more aggressive targets. For example, the Illinois Legislature recently passed a law requiring that their utilities ramp up their efficiency programs to achieve 1% annual savings as a percent of sales by 2012, and 2% by 2015, and Minnesota recently enacted a law requiring energy saving targets for utilities of 1.5% of sales.[7]

Comparison of Highest POU Targets

While there are numerous reasons why utility energy saving targets can vary, it can be instructive to compare the utilities' targets based on a variety of metrics. The following tables rank the highest utility targets using three different metrics. (See Attachment B for a discussion of the merit of these metrics.) The following utilities, listed in alphabetical order, rank among the top ten in at least two of the three comparisons: **Burbank**, Corona, **Glendale**, Hercules, **Imperial Irrigation District**, Island Energy, **LADWP,** Needles, Port of Oakland, **Pasadena**, **Riverside**,

---

[6] Kushler, M., D. York, and P. Witee, "Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies," April 2004, p. vi.
[7] Illinois Senate Bill 1592, Sec. 12-103, http://www.ilga.gov/legislation/95/SB/PDF/09500SB1592enr.pdf. Minnesota S.F. 145, www.revisor.leg.state.mn.us/bin/bldbill.php?bill=S0145.2.html&session=ls85.

and **SMUD**. (**Bolded** utilities are forecast to provide more than 1% of total POU energy in 2016.)

1. Savings as Percent of Sales

The first comparative metric is each POU's targeted energy savings in 2016 as a percent of the POU's forecast energy consumption in 2016. AB 2021 stated the Legislature's intent that "all load-serving entities procure all cost-effective energy efficiency measures so that the state can meet the goal of reducing total forecasted electrical consumption by 10 percent over the next 10 years." Table 1 ranks all the POUs using this metric, and Table 2 ranks only the fifteen *largest* POUs (which are expected to comprise nearly 95% of the POUs' energy consumption in 2016) using this metric.

Table 1: Top Ten POUs Ranked by Savings as Percent of Sales

Utility	2016 Cumulative Annual Energy Saving Target as Percent of 2016 Energy Forecast
1. SMUD	12.9%
2. Pasadena	12.5%
3. Needles	10.3%
4. Glendale	10.0%
5. Imperial Irrigation District	9.4%
6. Riverside	9.3%
7. Burbank	9.1%
8. Island Energy	8.3%
9. Port of Oakland	8.2%
10. LADWP	7.8%

Table 2: Fifteen *Largest* POUs Ranked by Savings as Percent of Sales

Utility	Percent of Total POU Sales in 2016	2016 Cumulative Annual Energy Saving Target as Percent of 2016 Energy Forecast
1. LADWP	35.9%	7.8%
2. SMUD	19.2%	12.9%
3. Imperial Irrigation District	6.6%	9.5%
4. Modesto Irrigation District	4.8%	4.0%
5. Silicon Valley Power	4.7%	7.7%
6. Anaheim	4.1%	5.7%
7. Riverside	3.6%	9.3%
8. Turlock Irrigation District	3.2%	6.0%
9. Roseville	2.2%	5.6%
10. Pasadena	2.0%	12.5%
11. Vernon	1.8%	0%
12. Burbank	1.7%	9.1%
13. Glendale	1.6%	10.0%
14. Palo Alto	1.4%	3.3%
15. Redding	1.3%	4.5%

2. Target as Percent of Economic Potential

The second comparative metric presents each POUs' 2016 energy saving target as a percent of the potential for *all* cost-effective energy savings identified for that POU. The law requires that utilities "acquire all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible." (Public Utilities Code Section 9615) The economic potential identifies the cost-effective savings, whereas the target is intended to represent the subset of savings that that are also "reliable and feasible."

Table 3: Top Ten POUs Ranked by Target as Percent of Economic Potential

Utility	2016 Energy Saving Target as Percent of Economic Potential
1. Pasadena	100%
2. Island Energy	79%
3. Port of Oakland	72%
4. Glendale	64%
5. SMUD	63%
6. Burbank	62%
7. Riverside	61%
8. Hercules	54%
9. Corona	53%
10. Anaheim	53%

Note: Redding, Palo Alto, and Vernon did not report economic potentials, and therefore could not be included in this comparison. All economic potentials are from the RMI report, except SMUD's, which is from the 2006 Itron study commissioned by SMUD.

3. **Target as Percent Increase from 2006**

Many POUs' targets represent a substantial increase in energy savings relative to current achievements. While utilities that already have aggressive energy efficiency programs will rank lower using this metric, it is also important to recognize those utilities that are significantly ramping-up their efforts.

Table 4: Top Ten POUs Ranked by Increase in Savings Relative to 2006

Utility	Average Annual Savings as Percent Increase from 2006 Savings
1. Hercules	296427%
2. Needles	4498%
3. Healdsburg	4118%
4. Corona	3536%
5. Merced	2449%
6. Imperial Irrigation District	2054%
7. Truckee Donner	2037%
8. LADWP	1123%
9. Gridley	850%
10. Lassen	847%

Note: All POUs are small (forecasted to provide less than 1% of total POU energy in 2016), except Imperial Irrigation District and LADWP.

Comparison of Lowest POU Targets

There are numerous reasons why utility energy saving targets can vary, and many legitimate reasons why a utility might set a relatively lower energy saving target than other utilities. But it can be instructive to compare the utilities' targets based on a variety of metrics to identify those utilities that may not have set aggressive enough targets to meet AB 2021's requirements. The following tables rank the lowest utility targets using the same three metrics discussed above. The following utilities, in alphabetical order, rank among the lowest in at least two of the three comparisons: Alameda, Gridley, Healdsburg, Plumas Sierra, Shasta Lake, Trinity, Ukiah, and **Vernon**. (Vernon is the only utility forecasted to provide more than 1% of total POU energy in 2016.)

While some or all of these utilities may have legitimate reasons for their comparatively low energy saving targets (for example, Alameda states that because of its climate and customer base many of the top measures in the RMI model do not apply), we urge the Commission to pay particular attention to whether these utilities' targets meet the law's requirement to "identify all potentially achievable cost-effective" energy savings and to "acquire all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible." (Public Utilities Code Section 9615)

1. **Savings as Percent of Sales**

The utilities presented in Table 5 proposed the lowest targeted energy savings in 2016 as a percent of each POU's forecast energy consumption.

Table 5: POUs Ranked by Lowest Savings as Percent of Sales

Utility	2016 Cumulative Annual Energy Saving Target as Percent of 2016 Energy Forecast
1. Vernon	No target
2. Trinity	0.0%
3. Ukiah	1.5%
4. Shasta Lake	1.6%
5. Alameda	1.6%
6. Gridley	1.9%
7. Healdsburg	2.3%
8. Plumas Sierra	3.1%
9. Palo Alto	3.3%
10. Lodi	3.6%

2. Target as Percent of Economic Potential

Table 6 presents each POUs' 2016 energy saving target as a percent of the potential for *all* cost-effective energy savings identified for that POU.

Table 6: POUs Ranked by Lowest Target as Percent of Economic Potential

Utility	2016 Energy Saving Target as Percent of Economic Potential
1. Trinity	0%
2. Shasta Lake	10%
3. Alameda	11%
4. Ukiah	11%
5. Gridley	14%
6. Healdsburg	17%
7. Plumas Sierra	24%
8. Banning	25%
9. Lassen	29%
10. Lodi	30%

Note: Redding, Palo Alto, and Vernon did not report economic potentials, and therefore were not included in this comparison.

We urge the CEC to require the POUs included in Table 7, which chose to set a target of significantly less than 50% of the economic potential identified by RMI ("Option 1, Scenario 2"), to document the specific changes, and the rationale for those changes, that were made by each utility to the RMI analysis in setting their targets. This is needed to meet AB 2021's requirement that the POUs provide the Commission with the "basis for establishing [their] targets," and to enable the CEC and stakeholders to evaluate these utilities' targets. (Note that each of these utilities is forecasted to provide less than 1% of total POU energy in 2016, except Vernon.)

Table 7: POUs with Targets Significantly Less Than 50% of Economic Potential

Utility	2016 Energy Saving Target as Percent of Economic Potential
1. Vernon	No target
2. Trinity	0%
3. Shasta Lake	10%
4. Alameda	11%
5. Ukiah	11%
6. Gridley	14%
7. Healdsburg	17%
8. Plumas Sierra	23%
9. Banning	25%
10. Lassen	29%
11. Lodi	30%
12. Biggs	36%
13. Colton	37%

Note: Redding, Palo Alto, and Vernon did not report economic potentials, and therefore were not included in this comparison.

3. **Target as Percent Increase from 2006**

Table 8 presents the POUs whose draft targets represent the smallest increase in energy savings relative to current achievements. Two utilities – Trinity and Vernon – did not propose targets at all; these are particularly troubling and merit close attention from the CEC.

This comparative metric is the least useful of the three presented in this memo, because a utility that *already* has an aggressive energy efficiency program would not need to increase its energy savings and therefore would rank low using this metric. However, it is interesting to note that as a group the POUs are increasing savings so substantially that even nearly doubling energy savings is among the lowest ten in ranking. As a result, Table 8 only presents those POUs that are increasing savings by less than 50%.

Table 8: POUs Ranked by Smallest Increase in Savings Relative to 2006

Utility	Average Annual Savings Increase as Percent of 2006 Savings
1. Vernon	No target
2. Trinity	-100%
3. Port of Oakland	1%
4. Redding	7%
5. Azusa	10%
6. Anaheim	31%
7. Glendale	34%

IV. Assessment of Target Setting Process

While a few POUs proactively conducted studies of the potential for cost-effective energy efficiency savings in their service territory prior to the passage of AB 2021, most of the POUs had a very short period of time to complete a potential study and set draft targets after the law went into effect.

NRDC commends the POUs for working with expert consultants to conduct potential studies to use as the basis for setting targets. As we noted above, the Rocky Mountain Institute conducted one joint potential study for 33 POUs (most of the POUs in the state). LADWP, SMUD, Palo Alto and Redding submitted separate targets to the CEC based on prior studies conducted by Itron and Nexant.

Analyses of the potential for energy efficiency savings require numerous data inputs and assumptions, as well as expert judgment. The key *default* input assumptions RMI used generally appear to be reasonable. However, RMI's model allowed utilities to *change* some of the default input assumptions, but these changes were not made publicly available. While there are certainly legitimate reasons for utilities to change these default assumptions, *we urge the Commission to require the POUs to submit the actual input assumptions that they used*.

- **Cost-effectiveness test:** The cost-effectiveness test was fixed as the Total Resource Cost (TRC) test for all utilities.[8] NRDC believes that the TRC test, which accounts for the costs and benefits from a societal perspective, is the appropriate cost-effectiveness test.
- **Avoided costs:** RMI incorporated utility-specific avoided costs, or substituted the IOU most similar to the POU's avoided costs developed by E3.[9] While this is a reasonable approach, the report did not indicate whether any utilities provided their own avoided costs, nor present any of those avoided costs, so we are unable to fully evaluate the avoided costs. The IOU avoided costs developed by E3 and

[8] CMUA Report, p. 20; Email from Scott Tomashefsky, NCPA, July 26, 2007.
[9] CMUA Report, pp. 13, 20-21.

adopted by the CPUC include all relevant cost components (including generation, transmission, distribution, and environmental costs).[10]

- **Discount rate:** RMI used a default discount rate of 5% real to calculate cost-effectiveness.[11] POUs had the option of specifying a different discount rate, but the report does not present any POU-specific discount rates, so we are unable to fully evaluate the discount rate assumptions. However, the default rate of 5% real is consistent with the rate the CPUC uses for the IOUs (around 8% nominal).
- **Net-to-gross ratio:** The RMI study provided *net* potential numbers, based on the net-to-gross ratio reported by Itron (which conducted the most recent IOU potential study) for each measure.[12] POUs had the ability to change the net-to-gross assumptions, but no utility made any changes to them.[13]
- **Measure savings:** The measure savings used in the RMI study are largely drawn from the Itron potential study, which in turn was based primarily on California's Database for Energy Efficiency Resources (DEER). NRDC believes that this is a reasonable approach.

California law requires that utilities "acquire all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible." (Public Utilities Code Section 9615) The economic potential identifies the cost-effective savings. Identifying the achievable savings, or those that are "reliable and feasible," requires a combination of modeling based on program experience to date and potential measure penetration and market uptake rates, as well as expert judgment. While determining the achievable potential is a mixture of a science and an art, most POUs provided no explanation for how they determined what portion of the economic potential would be feasible.

Many of the POUs chose to adopt energy savings targets close to 50% of the economic potential identified by RMI. This was identified as RMI's "Option 1, Scenario 2" for determining the feasible potential. However, RMI did not provide a rationale for why 50% would be a reasonable level, and the POUs did not provide any rationale for choosing that level instead of RMI's Scenario 3 at 80% of economic potential. A review of other recent potential studies presented in Table 9 reveals that on average achievable potential was 59% of economic potential.

[10] NCPA states that the E3 costs used by RMI included all of these cost components. Email from Scott Tomashefsky, NCPA, August 15, 2007.
[11] CMUA Report, p. 13.
[12] CMUA Report, p. 14.
[13] Email from Scott Tomashefsky, NCPA, July 26, 2007.

Table 9: Ratio of Maximum Achievable to Economic Potential in Recent Energy Efficiency Potential Studies

Study	Ratio of maximum achievable potential to economic potential
California's *Secret Surplus*, 2002[14]	75%
California Energy Commission, 2003[15]	85%
ACEEE, 2004[16]	58%
California IOUs, 2006[17]	45%
LADWP, 2006[18]	52%
SMUD, 2006[19]	38%
Average	**59%**

We recognize that the POUs developed the potential study and targets under significant time constraints this year and with limited resources. In addition, we recognize that many POUs will need to ramp up their programs substantially in order to meet their targets and that process will take time. As such, NRDC believes that selecting 50% of the economic potential was reasonable for this first-ever process of setting energy saving targets, given the circumstances. However, we urge the CEC to recommend that the POUs conduct a more rigorous assessment of the feasible potential when they update their targets in three years, and require that the POUs provide detail on their methodology for determining feasible potential as part of AB 2021's requirement that the POUs provide the Commission with the "basis for establishing [their] targets."

Finally, many of the POUs have proposed targets that would significantly increase savings in the first year, and then maintain that higher savings rate for every subsequent year of the ten-year period. Efficiency programs, and the extensive infrastructure of contractors and implementers that they rely upon, cannot be expanded overnight. We urge the CEC to evaluate the ramp-up rate for each POU's target to determine if it is achievable and sustainable. Where necessary to ensure sustained success, we urge the CEC to recommend that the POUs use a more reasonable ramp-up rate at the beginning of the ten-year period and a more aggressive ramp rate in later years.

---

[14] Rufo, M. and F. Coito, *California's Secret Energy Surplus: the Potential for Energy Efficiency,* Xenergy Inc. for the Energy Foundation and the Hewlett Foundation, 2002. Economic potential is 40,000 GWh and maximum achievable potential is 30,000 GWh.

[15] California Energy Commission, *Proposed Energy Savings Goals for Energy Efficiency Programs in California,* Publication 100-03-021, October 27, 2003. Economic potential is 35,325 GWh and achievable potential is 30,000 GWh.

[16] Nadel, S., A. Shipley and R. N. Elliott, The Technical, Economic and Achievable Potential for Energy-Efficiency in the U.S. – A Meta-Analysis of Recent Studies, proceedings of the 2004 ACEEE Summer Study on Energy Efficiency in Buildings, 2004.

[17] Itron, Inc. et al, *California Energy Efficiency Potential Study*, CALMAC Study ID: PGE0211.01, May 24, 2006, p. ES-8. Economic potential is 53,150 GWh and maximum achievable potential is 23,974 GWh.

[18] Quantum Consulting, Inc., *Los Angeles Department of Water and Power Energy Efficiency Potential Study,* prepared for Los Angeles Department of Water and Power, February 8, 2006. Economic potential is 4049 and maximum achievable potential is 2117 GWh.

[19] Itron, Inc. *Energy Efficiency Potential Study: Executive Summary,* for the Sacramento Municipal Utility District, June 2, 2006. Economic potential is 2,851 GWh and maximum achievable potential is 1073 GWh.

V. Conclusion

In summary, our preliminary analysis shows that the draft targets proposed by many of the POUs are reasonable and meet AB 2021's requirement to set targets to capture all energy efficiency savings that are "cost effective, reliable, and feasible." NRDC commends the POUs overall for the significant increase in energy savings that their draft targets represent.

However, some POUs did not submit adequate information to enable the CEC to fully evaluate their targets, and we urge the CEC to require that those POUs submit the additional information identified in this memo. In addition, we urge the CEC to set clear guidelines for upcoming SB 1037 reports and future AB 2021 targets.

NRDC recommends that the CEC set a statewide energy saving target based on the sum of the IOU and POU targets, using a target of 50% of economic potential or 1% annual energy savings as a percent of sales for each of the POUs that proposed targets lower than 50% of economic potential, unless the Commission determines that the POU had a reasonable basis for setting lower targets.

Finally, NRDC recommends that the Commission work with the POUs to help them succeed in meeting the significantly increased energy saving targets.

Attachment A: Additional Detail on the POUs' Draft Targets

Figure 1 shows the combined POU annual energy efficiency additions as well as their cumulative energy efficiency targets.

Figure A-1

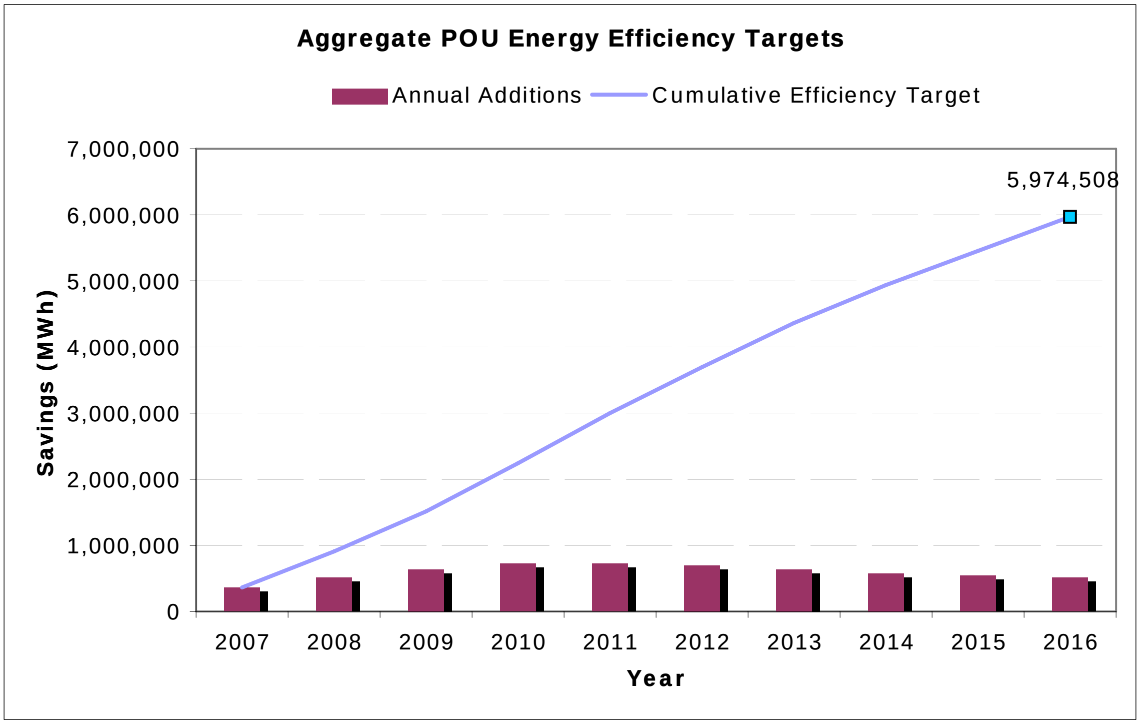


Table A-1: Aggregated Energy Efficiency Target Comparison Metrics

POU 2016 Efficiency Target (MWh)	5,974,508
POU 2016 Demand Reduction Target (MW)	1,232
Metric Tons of CO2 Emissions Avoided (CO2 equivalent)[(1)]	2,247,906
Net Benefits (Billion $)[(2)]	2.17
POU 2016 Cumulative EE Target as % of 2016 Energy Sales	8%
IOU 2016 Cumulative EE Target as % of 2016 Energy Sales[(3)]	12%
POU FY 2005-06 Reported EE Savings as % of 2005 Sales[(4)]	0.3%
POU 2007-2016 Average Annual Savings as Percent of Sales (%/yr)	0.9%
Average Annual EE Savings as % increase from 2006 EE Savings	253%
POU 2016 Target as % of Economic Efficiency Potential[(5)]	55%
IOU 2016 Target as % of Economic Efficiency Potential[(3)]	58%

(1) NRDC calculation assuming 376 metric tons of CO2 per GWh saved, see footnote 3

(2) NRDC calculation assuming $259/MWh saved and net benefits are 1.4 times program costs, see footnote 5

(3) CPUC's annual additions to EE targets for the IOUs are assumed to be equivalent to 2013 annual additions for 2014-2016 (2631MWh/yr). IOU energy efficiency economic potential is gross potential.

(4) 2005 Sales data are from EIA Form 861

(5) Palo Alto is not included in this calculation b/c it did not calculate an economic EE potential. POU potentials based on the RMI analysis are net potential.

Table A-2: Publicly Owned Utilities Listed Alphabetically

Utility	2016 Energy Savings Target (1)	2016 Demand Reduction Target (1)	Reported FY 2005-06 EE Savings (2)	2007 Energy Target Increase Compared to FY 2005-06 Reported Savings	Average Annual Savings Additions Compared to 2006 Energy Savings	Average Annual Savings Additions (1)	2016 Target as % of Total POU Target	2016 Energy Use Forecast (1)	Percentage of 2016 POU Energy Use	2016 Target as % of 2016 Economic Potential (1)	2016 Cumulative Target as % of 2016 Energy Forecast	Average Annual Savings as % of Average Annual Energy Use	FY 2005-06 EE Savings as % of 2005 Energy Use (2)(8)
	(MWh)	(MW)	(MWh)	(%)	(%)	(MWh/yr)	(%)	(MWh)	(%)	(%)	(%)	(%)	(%)
Alameda	7,605	1	279	172%	172%	760	0.13%	469,700	0.65%	11.1%	1.62%	0.17%	0.07%
Anaheim	167,682	35	12,766	25%	31%	16,768	2.81%	2,941,017	4.08%	52.8%	5.70%	0.60%	0.50%
Azusa	20,840	2	1,897	10%	10%	2,084	0.35%	291,564	0.40%	50.6%	7.15%	0.76%	0.76%
Banning	8,734	1	96	813%	813%	873	0.15%	197,618	0.27%	24.9%	4.42%	0.48%	0.07%
Biggs	1,063	0	35	206%	206%	106	0.02%	18,701	0.03%	36.2%	5.68%	0.59%	0.18%
Burbank	113,073	24	5,574	103%	103%	11,307	1.89%	1,241,816	1.72%	62.3%	9.11%	0.95%	0.51%
Colton	26,254	3	943	178%	178%	2,625	0.44%	488,634	0.68%	37.3%	5.37%	0.61%	0.28%
Corona	4,669	1	13	3536%	3536%	467	0.08%	89,178	0.12%	52.8%	5.24%	0.60%	0.01%
Glendale	113,620	13	8,463	34%	34%	11,362	1.90%	1,140,000	1.58%	63.5%	9.97%	1.00%	0.77%
Gridley	917	0	10	850%	850%	92	0.02%	47,227	0.07%	14.3%	1.94%	0.21%	0.03%
Healdsburg	1,984	0	5	4118%	4118%	198	0.03%	84,864	0.12%	16.8%	2.34%	0.24%	Not Reported
Hercules	1,364	0	0	296427%	296427%	136	0.02%	18,151	0.03%	54.3%	7.51%	0.79%	Not Reported
Imperial Irr. Dist.	450,666	61	2,093	2054%	2054%	45,067	7.54%	4,770,952	6.61%	50.1%	9.45%	1.08%	0.07%
Island Energy	1,777	0	Not Reported	n/a	n/a	178	0.03%	21,326	0.03%	78.8%	8.33%	0.91%	Not Reported
LADWP (3)	2,026,000	420	16,561	1711%	1123%	202,600	33.91%	25,927,000	35.93%	50.0%	7.81%	0.81%	0.07%
Lassen	7,333	1	77	847%	847%	733	0.12%	167,596	0.23%	28.9%	4.38%	0.47%	0.06%
Lodi	20,001	2	889	125%	125%	2,000	0.33%	557,864	0.77%	29.6%	3.59%	0.39%	0.20%
Lompoc	11,210	1	138	712%	712%	1,121	0.19%	152,465	0.21%	52.2%	7.35%	0.75%	0.10%
Merced	36,195	4	142	2449%	2449%	3,619	0.61%	575,253	0.80%	50.3%	6.29%	0.73%	0.04%
Modesto Irr. Dist.	138,557	16	3,222	330%	330%	13,856	2.32%	3,452,432	4.78%	50.0%	4.01%	0.45%	0.12%
Moreno Valley	8,221	1	245	236%	236%	822	0.14%	109,642	0.15%	51.6%	7.50%	1.11%	Not Reported
Needles	8,173	1	18	4498%	4498%	817	0.14%	79,200	0.11%	49.0%	10.32%	1.12%	0.03%
Oakland	8,837	1	879	1%	1%	884	0.15%	108,238	0.15%	71.7%	8.16%	0.93%	Not Reported
Palo Alto (5)	32,800	2	1,877	33%	75%	3,280	0.55%	1,004,307	1.39%	n/a	3.27%	0.33%	0.20%
Pasadena	181,260	22	4,501	11%	303%	18,126	3.03%	1,452,040	2.01%	100.0%	12.48%	1.33%	0.38%
Plumas Sierra	6,209	1	90	589%	589%	621	0.10%	202,378	0.28%	23.5%	3.07%	0.33%	0.06%
Rancho Cucamonga	4,478	1	134	234%	234%	448	0.07%	78,100	0.11%	51.8%	5.73%	0.60%	Not Reported
Redding (6)	42,549	18	3,965	-24%	7%	4,255	0.71%	953,329	1.32%	n/a	4.46%	0.49%	0.51%
Riverside	240,380	22	3,117	612%	671%	24,038	4.02%	2,587,000	3.58%	61.1%	9.29%	1.00%	0.16%
Roseville	87,162	11	4,569	91%	91%	8,716	1.46%	1,569,010	2.17%	51.4%	5.56%	0.61%	0.39%
Shasta Lake	1,292	0	37	249%	249%	129	0.02%	82,347	0.11%	9.8%	1.57%	0.16%	0.02%
SMUD (4)	1,784,000	518	84,963	-18%	110%	178,400	29.86%	13,870,000	19.22%	62.6%	12.86%	1.43%	0.81%
SVP	257,620	30	4,687	450%	450%	25,762	4.31%	3,356,218	4.65%	50.0%	7.68%	0.82%	0.19%
Turlock Irr. Dist.	139,990	16	6,883	14%	103%	13,999	2.34%	2,335,702	3.24%	47.5%	5.99%	0.65%	0.38%
Trinity	0	0	22	-100%	-100%	0	0.00%	105,301	0.15%	0.0%	0.00%	0.00%	0.03%
Truckee Donner	10,014	1	47	2037%	2037%	1,001	0.17%	184,710	0.26%	49.3%	5.42%	0.59%	0.03%
Ukiah	1,979	0	22	820%	820%	198	0.03%	131,296	0.18%	11.2%	1.51%	0.16%	0.02%
Vernon (7)	Not Reported	Not Reported	44	n/a	n/a	Not Reported	n/a	1,306,313	1.81%	n/a	n/a	n/a	0.00%
TOTAL	**5,974,508**	**1,232**	**169,303**	**238%**	**253%**	**597,451**	**100%**	**72,168,489**	**100%**	**54.6%**	**8.28%**	**0.89%**	**0.28%**

Notes:

(1) 2016 energy savings targets, 2016 demand reduction targets, annual savings additions, 2016 energy forecasts, and 2016 economic potential are from the spreadsheet used to develop: CMUA, *Establishing Energy Efficiency Targets: A Public Power Response to AB 2021*, June 2007, obtained via personal communication with Scott Tomashefsky of NCPA, July 6, 2007, unless otherwise noted. Annual savings "additions" are the incremental savings in a given year from new energy efficiency program activity. Energy savings in 2016 are the cumulative annual savings in the year 2016 resulting from the programs conducted from 2007 through 2016.
(2) Reported FY 2005-06 energy savings are from: CMUA, NCPA, and SCPPA, *Energy Efficiency in California's Public Power Sector: A Status Report,* December, 2006.
(3) LADWP targets and the 2016 energy forecast for LADWP were obtained from Cynthia Rogers of the CEC in a personal email communication August 13, 2007
(4) SMUD targets were obtained from Jim Parks of SMUD in a personal communication July 31, 2007; the forecast 2016 SMUD energy use is from: CEC, California Energy Demand 2008-2018, Staff Draft Forecast, CEC-200-
(5) The City of Palo Alto targets and 2016 energy use forecast were obtained from a personal communication with Karl Knapp of Palo Alto Utilities July 31, 2007

(6) Redding Electric Utility targets and forecast 2016 energy use are from: Nexant, *Redding Electric Potential Study*, 2007. Energy efficiecny targets were estimated by Gary Klein of the CEC using Figure 1 in the report.
(7) Vernon's 2016 energy forecast was estimated using 2005 total sales data from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html, and applying the energy sales growth rates for the SCE service territory from: CEC, *California Energy Demand 2008-2018*, Staff Draft Forecast, CEC-200-2007-015SD, July, 2007.
(8) 2005 energy sales data are from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html.

Table A-3: Publicly Owned Utilities Sorted By Size (2016 MWh forecast)

Utility	2016 Energy Savings Target (1)	2016 Demand Reduction Target (1)	Reported FY 2005-06 EE Savings (2)	2007 Energy Target Increase Compared to FY 2005-06 Reported Savings	Average Annual Savings Additions Compared to 2006 Energy Savings	Average Annual Savings Additions (1)	2016 Target as % of Total POU Target	2016 Energy Use Forecast (1)	Percentage of 2016 POU Energy Use	2016 Target as % of 2016 Economic Potential (1)	2016 Cumulative Target as % of 2016 Energy Forecast	Average Annual Savings as % of Average Annual Energy Use	FY 2005-06 EE Savings as % of 2005 Energy Use (2)(8)
	(MWh)	(MW)	(MWh)	(%)	(%)	(MWh/yr)	(%)	(MWh)	(%)	(%)	(%)	(%)	(%)
LADWP (3)	2,026,000	420	16,561	1711%	1123%	202,600	33.91%	25,927,000	**35.93%**	50.04%	7.81%	0.81%	0.07%
SMUD (4)	1,784,000	518	84,963	-18%	110%	178,400	29.86%	13,870,000	**19.22%**	62.57%	12.86%	1.43%	0.81%
Imperial Irr. Dist.	450,666	61	2,093	2054%	2054%	45,067	7.54%	4,770,952	**6.61%**	50.08%	9.45%	1.08%	0.07%
Modesto Irr. Dist.	138,557	16	3,222	330%	330%	13,856	2.32%	3,452,432	**4.78%**	50.02%	4.01%	0.45%	0.12%
SVP	257,620	30	4,687	450%	450%	25,762	4.31%	3,356,218	**4.65%**	50.03%	7.68%	0.82%	0.19%
Anaheim	167,682	35	12,766	25%	31%	16,768	2.81%	2,941,017	**4.08%**	52.82%	5.70%	0.60%	0.50%
Riverside	240,380	22	3,117	612%	671%	24,038	4.02%	2,587,000	**3.58%**	61.14%	9.29%	1.00%	0.16%
Turlock Irr. Dist.	139,990	16	6,883	14%	103%	13,999	2.34%	2,335,702	**3.24%**	47.49%	5.99%	0.65%	0.38%
Roseville	87,162	11	4,569	91%	91%	8,716	1.46%	1,569,010	**2.17%**	51.36%	5.56%	0.61%	0.39%
Pasadena	181,260	22	4,501	11%	303%	18,126	3.03%	1,452,040	**2.01%**	100.00%	12.48%	1.33%	0.38%
Vernon (7)	Not Reported	Not Reported	44	n/a	n/a	Not Reported	n/a	1,306,313	**1.81%**	n/a	n/a	n/a	0.00%
Burbank	113,073	24	5,574	103%	103%	11,307	1.89%	1,241,816	**1.72%**	62.34%	9.11%	0.95%	0.51%
Glendale	113,620	13	8,463	34%	34%	11,362	1.90%	1,140,000	**1.58%**	63.47%	9.97%	1.00%	0.77%
Palo Alto (5)	32,800	2	1,877	33%	75%	3,280	0.55%	1,004,307	**1.39%**	n/a	3.27%	0.33%	0.20%
Redding (6)	42,549	18	3,965	-24%	7%	4,255	0.71%	953,329	**1.32%**	n/a	4.46%	0.49%	0.51%
Merced	36,195	4	142	2449%	2449%	3,619	0.61%	575,253	**0.80%**	50.26%	6.29%	0.73%	0.04%
Lodi	20,001	2	889	125%	125%	2,000	0.33%	557,864	**0.77%**	29.60%	3.59%	0.39%	0.20%
Colton	26,254	3	943	178%	178%	2,625	0.44%	488,634	**0.68%**	37.29%	5.37%	0.61%	0.28%
Alameda	7,605	1	279	172%	172%	760	0.13%	469,700	**0.65%**	11.12%	1.62%	0.17%	0.07%
Azusa	20,840	2	1,897	10%	10%	2,084	0.35%	291,564	**0.40%**	50.59%	7.15%	0.76%	0.76%
Plumas Sierra	6,209	1	90	589%	589%	621	0.10%	202,378	**0.28%**	23.49%	3.07%	0.33%	0.06%
Banning	8,734	1	96	813%	813%	873	0.15%	197,618	**0.27%**	24.86%	4.42%	0.48%	0.07%
Truckee Donner	10,014	1	47	2037%	2037%	1,001	0.17%	184,710	**0.26%**	49.28%	5.42%	0.59%	0.03%
Lassen	7,333	1	77	847%	847%	733	0.12%	167,596	**0.23%**	28.94%	4.38%	0.47%	0.06%
Lompoc	11,210	1	138	712%	712%	1,121	0.19%	152,465	**0.21%**	52.17%	7.35%	0.75%	0.10%
Ukiah	1,979	0	22	820%	820%	198	0.03%	131,296	**0.18%**	11.25%	1.51%	0.16%	0.02%
Moreno Valley	8,221	1	245	236%	236%	822	0.14%	109,642	**0.15%**	51.57%	7.50%	1.11%	Not Reported
Oakland	8,837	1	879	1%	1%	884	0.15%	108,238	**0.15%**	71.70%	8.16%	0.93%	Not Reported
Trinity	0	0	22	-100%	-100%	0	0.00%	105,301	**0.15%**	0.00%	0.00%	0.00%	0.03%
Corona	4,669	1	13	3536%	3536%	467	0.08%	89,178	**0.12%**	52.84%	5.24%	0.60%	0.01%
Healdsburg	1,984	0	5	4118%	4118%	198	0.03%	84,864	**0.12%**	16.78%	2.34%	0.24%	Not Reported
Shasta Lake	1,292	0	37	249%	249%	129	0.02%	82,347	**0.11%**	9.78%	1.57%	0.16%	0.02%
Needles	8,173	1	18	4498%	4498%	817	0.14%	79,200	**0.11%**	48.96%	10.32%	1.12%	0.03%
Rancho Cucamonga	4,478	1	134	234%	234%	448	0.07%	78,100	**0.11%**	51.82%	5.73%	0.60%	Not Reported
Gridley	917	0	10	850%	850%	92	0.02%	47,227	**0.07%**	14.31%	1.94%	0.21%	0.03%
Island Energy	1,777	0	Not Reported	n/a	n/a	178	0.03%	21,326	**0.03%**	78.81%	8.33%	0.91%	Not Reported
Biggs	1,063	0	35	206%	206%	106	0.02%	18,701	**0.03%**	36.21%	5.68%	0.59%	0.18%
Hercules	1,364	0	0	296427%	296427%	136	0.02%	18,151	**0.03%**	54.27%	7.51%	0.79%	Not Reported
TOTAL	**5,974,508**	**1,232**	**169,303**	**238%**	**253%**	**597,451**	**100%**	**72,168,489**	**100%**	**54.63%**	**8.28%**	**0.89%**	**0.28%**

Notes:

(1) 2016 energy savings targets, 2016 demand reduction targets, annual savings additions, 2016 energy forecasts, and 2016 economic potential are from the spreadsheet used to develop: CMUA, *Establishing Energy Efficiency Targets: A Public Power Response to AB 2021*, June 2007, obtained via personal communication with Scott Tomashefsky of NCPA, July 6, 2007, unless otherwise noted. Annual savings "additions" are the incremental savings in a given year from new energy efficiency program activity. Energy savings in 2016 are the cumulative annual savings in the year 2016 resulting from the programs conducted from 2007 through 2016.
(2) Reported FY 2005-06 energy savings are from: CMUA, NCPA, and SCPPA, *Energy Efficiency in California's Public Power Sector: A Status Report,* December, 2006.
(3) LADWP targets and the 2016 energy forecast for LADWP were obtained from Cynthia Rogers of the CEC in a personal email communication August 13, 2007
(4) SMUD targets were obtained from Jim Parks of SMUD in a personal communication July 31, 2007; the forecast 2016 SMUD energy use is from: CEC, California Energy Demand 2008-2018, Staff Draft Forecast, CEC-200-
(5) The City of Palo Alto targets and 2016 energy use forecast were obtained from a personal communication with Karl Knapp of Palo Alto Utilities July 31, 2007.
(6) Redding Electric Utility targets and forecast 2016 energy use are from: Nexant, *Redding Electric Potential Study*, 2007. Energy efficiecny targets were estimated by Gary Klein of the CEC using Figure 1 in the report.
(7) Vernon's 2016 energy forecast was estimated using 2005 total sales data from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html, and applying the energy sales growth rates for the SCE service territory from: CEC, *California Energy Demand 2008-2018*, Staff Draft Forecast, CEC-200-2007-015SD, July, 2007.
(8) 2005 energy sales data are from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html.

Table A-4: Publicly Owned Utilities Sorted By 2016 Target as % of 2016 Energy Forecast

Utility	2016 Energy Savings Target (1)	2016 Demand Reduction Target (1)	Reported FY 2005-06 EE Savings (2)	2007 Energy Target Increase Compared to FY 2005-06 Reported Savings	Average Annual Savings Additions Compared to 2006 Energy Savings	Average Annual Savings Additions (1)	2016 Target as % of Total POU Target	2016 Energy Use Forecast (1)	Percentage of 2016 POU Energy Use	2016 Target as % of 2016 Economic Potential (1)	2016 Cumulative Target as % of 2016 Energy Forecast	Average Annual Savings as % of Average Annual Energy Use	FY 2005-06 EE Savings as % of 2005 Energy Use (2)(8)
	(MWh)	(MW)	(MWh)	(%)	(%)	(MWh/yr)	(%)	(MWh)	(%)	(%)	(%)	(%)	(%)
SMUD (4)	1,784,000	518	84,963	-18%	110%	178,400	29.86%	13,870,000	19.22%	62.57%	**12.86%**	1.43%	0.81%
Pasadena	181,260	22	4,501	11%	303%	18,126	3.03%	1,452,040	2.01%	100.00%	**12.48%**	1.33%	0.38%
Needles	8,173	1	18	4498%	4498%	817	0.14%	79,200	0.11%	48.96%	**10.32%**	1.12%	0.03%
Glendale	113,620	13	8,463	34%	34%	11,362	1.90%	1,140,000	1.58%	63.47%	**9.97%**	1.00%	0.77%
Imperial Irr. Dist.	450,666	61	2,093	2054%	2054%	45,067	7.54%	4,770,952	6.61%	50.08%	**9.45%**	1.08%	0.07%
Riverside	240,380	22	3,117	612%	671%	24,038	4.02%	2,587,000	3.58%	61.14%	**9.29%**	1.00%	0.16%
Burbank	113,073	24	5,574	103%	103%	11,307	1.89%	1,241,816	1.72%	62.34%	**9.11%**	0.95%	0.51%
Island Energy	1,777	0	Not Reported	n/a	n/a	178	0.03%	21,326	0.03%	78.81%	**8.33%**	0.91%	Not Reported
Oakland	8,837	1	879	1%	1%	884	0.15%	108,238	0.15%	71.70%	**8.16%**	0.93%	Not Reported
LADWP (3)	2,026,000	420	16,561	1711%	1123%	202,600	33.91%	25,927,000	35.93%	50.04%	**7.81%**	0.81%	0.07%
SVP	257,620	30	4,687	450%	450%	25,762	4.31%	3,356,218	4.65%	50.03%	**7.68%**	0.82%	0.19%
Hercules	1,364	0	0	296427%	296427%	136	0.02%	18,151	0.03%	54.27%	**7.51%**	0.79%	Not Reported
Moreno Valley	8,221	1	245	236%	236%	822	0.14%	109,642	0.15%	51.57%	**7.50%**	1.11%	Not Reported
Lompoc	11,210	1	138	712%	712%	1,121	0.19%	152,465	0.21%	52.17%	**7.35%**	0.75%	0.10%
Azusa	20,840	2	1,897	10%	10%	2,084	0.35%	291,564	0.40%	50.59%	**7.15%**	0.76%	0.76%
Merced	36,195	4	142	2449%	2449%	3,619	0.61%	575,253	0.80%	50.26%	**6.29%**	0.73%	0.04%
Turlock Irr. Dist.	139,990	16	6,883	14%	103%	13,999	2.34%	2,335,702	3.24%	47.49%	**5.99%**	0.65%	0.38%
Rancho Cucamonga	4,478	1	134	234%	234%	448	0.07%	78,100	0.11%	51.82%	**5.73%**	0.60%	Not Reported
Anaheim	167,682	35	12,766	25%	31%	16,768	2.81%	2,941,017	4.08%	52.82%	**5.70%**	0.60%	0.50%
Biggs	1,063	0	35	206%	206%	106	0.02%	18,701	0.03%	36.21%	**5.68%**	0.59%	0.18%
Roseville	87,162	11	4,569	91%	91%	8,716	1.46%	1,569,010	2.17%	51.36%	**5.56%**	0.61%	0.39%
Truckee Donner	10,014	1	47	2037%	2037%	1,001	0.17%	184,710	0.26%	49.28%	**5.42%**	0.59%	0.03%
Colton	26,254	3	943	178%	178%	2,625	0.44%	488,634	0.68%	37.29%	**5.37%**	0.61%	0.28%
Corona	4,669	1	13	3536%	3536%	467	0.08%	89,178	0.12%	52.84%	**5.24%**	0.60%	0.01%
Redding (6)	42,549	18	3,965	-24%	7%	4,255	0.71%	953,329	1.32%	n/a	**4.46%**	0.49%	0.51%
Banning	8,734	1	96	813%	813%	873	0.15%	197,618	0.27%	24.86%	**4.42%**	0.48%	0.07%
Lassen	7,333	1	77	847%	847%	733	0.12%	167,596	0.23%	28.94%	**4.38%**	0.47%	0.06%
Modesto Irr. Dist.	138,557	16	3,222	330%	330%	13,856	2.32%	3,452,432	4.78%	50.02%	**4.01%**	0.45%	0.12%
Lodi	20,001	2	889	125%	125%	2,000	0.33%	557,864	0.77%	29.60%	**3.59%**	0.39%	0.20%
Palo Alto (5)	32,800	2	1,877	33%	75%	3,280	0.55%	1,004,307	1.39%	n/a	**3.27%**	0.33%	0.20%
Plumas Sierra	6,209	1	90	589%	589%	621	0.10%	202,378	0.28%	23.49%	**3.07%**	0.33%	0.06%
Healdsburg	1,984	0	5	4118%	4118%	198	0.03%	84,864	0.12%	16.78%	**2.34%**	0.24%	Not Reported
Gridley	917	0	10	850%	850%	92	0.02%	47,227	0.07%	14.31%	**1.94%**	0.21%	0.03%
Alameda	7,605	1	279	172%	172%	760	0.13%	469,700	0.65%	11.12%	**1.62%**	0.17%	0.07%
Shasta Lake	1,292	0	37	249%	249%	129	0.02%	82,347	0.11%	9.78%	**1.57%**	0.16%	0.02%
Ukiah	1,979	0	22	820%	820%	198	0.03%	131,296	0.18%	11.25%	**1.51%**	0.16%	0.02%
Trinity	0	0	22	-100%	-100%	0	0.00%	105,301	0.15%	0.00%	**0.00%**	0.00%	0.03%
Vernon (7)	Not Reported	Not Reported	44	n/a	n/a	Not Reported	n/a	1,306,313	1.81%	n/a	**n/a**	n/a	0.00%
TOTAL	**5,974,508**	**1,232**	**169,303**	**238%**	**253%**	**597,451**	**100%**	**72,168,489**	**100%**	**54.63%**	**8.28%**	**0.89%**	**0.28%**

Notes:

(1) 2016 energy savings targets, 2016 demand reduction targets, annual savings additions, 2016 energy forecasts, and 2016 economic potential are from the spreadsheet used to develop: CMUA, *Establishing Energy Efficiency Targets: A Public Power Response to AB 2021*, June 2007, obtained via personal communication with Scott Tomashefsky of NCPA, July 6, 2007, unless otherwise noted. Annual savings "additions" are the incremental savings in a given year from new energy efficiency program activity. Energy savings in 2016 are the cumulative annual savings in the year 2016 resulting from the programs conducted from 2007 through 2016.
(2) Reported FY 2005-06 energy savings are from: CMUA, NCPA, and SCPPA, *Energy Efficiency in California's Public Power Sector: A Status Report,* December, 2006.
(3) LADWP targets and the 2016 energy forecast for LADWP were obtained from Cynthia Rogers of the CEC in a personal email communication August 13, 2007
(4) SMUD targets were obtained from Jim Parks of SMUD in a personal communication July 31, 2007; the forecast 2016 SMUD energy use is from: CEC, California Energy Demand 2008-2018, Staff Draft Forecast, CEC-200
(5) The City of Palo Alto targets and 2016 energy use forecast were obtained from a personal communication with Karl Knapp of Palo Alto Utilities July 31, 2007;
(6) Redding Electric Utility targets and forecast 2016 energy use are from: Nexant, *Redding Electric Potential Study*, 2007. Energy efficiecny targets were estimated by Gary Klein of the CEC using Figure 1 in the report.
(7) Vernon's 2016 energy forecast was estimated using 2005 total sales data from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html, and applying the energy sales growth rates for the SCE service territory from: CEC, *California Energy Demand 2008-2018*, Staff Draft Forecast, CEC-200-2007-015SD, July, 2007.
(8) 2005 energy sales data are from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html.

Table A-5: Publicly Owned Utilities Sorted By Target as % of Economic Potential

Utility	2016 Energy Savings Target (1)	2016 Demand Reduction Target (1)	Reported FY 2005-06 EE Savings (2)	2007 Energy Target Increase Compared to FY 2005-06 Reported Savings	Average Annual Savings Additions Compared to 2006 Energy Savings	Average Annual Savings Additions (1)	2016 Target as % of Total POU Target	2016 Energy Use Forecast (1)	Percentage of 2016 POU Energy Use	2016 Target as % of 2016 Economic Potential (1)	2016 Cumulative Target as % of 2016 Energy Forecast	Average Annual Savings as % of Average Annual Energy Use	FY 2005-06 EE Savings as % of 2005 Energy Use (2)(8)
	(MWh)	(MW)	(MWh)	(%)	(%)	(MWh/yr)	(%)	(MWh)	(%)	(%)	(%)	(%)	(%)
Pasadena	181,260	22	4,501	11%	303%	18,126	3.03%	1,452,040	2.01%	**100%**	12.48%	1.33%	0.38%
Island Energy	1,777	0	Not Reported	n/a	n/a	178	0.03%	21,326	0.03%	**78.8%**	8.33%	0.91%	Not Reported
Oakland	8,837	1	879	1%	1%	884	0.15%	108,238	0.15%	**71.7%**	8.16%	0.93%	Not Reported
Glendale	113,620	13	8,463	34%	34%	11,362	1.90%	1,140,000	1.58%	**63.5%**	9.97%	1.00%	0.77%
SMUD (4)	1,784,000	518	84,963	-18%	110%	178,400	29.86%	13,870,000	19.22%	**62.6%**	12.86%	1.43%	0.81%
Burbank	113,073	24	5,574	103%	103%	11,307	1.89%	1,241,816	1.72%	**62.3%**	9.11%	0.95%	0.51%
Riverside	240,380	22	3,117	612%	671%	24,038	4.02%	2,587,000	3.58%	**61.1%**	9.29%	1.00%	0.16%
Hercules	1,364	0	0	296427%	296427%	136	0.02%	18,151	0.03%	**54.3%**	7.51%	0.79%	Not Reported
Corona	4,669	1	13	3536%	3536%	467	0.08%	89,178	0.12%	**52.8%**	5.24%	0.60%	0.01%
Anaheim	167,682	35	12,766	25%	31%	16,768	2.81%	2,941,017	4.08%	**52.8%**	5.70%	0.60%	0.50%
Lompoc	11,210	1	138	712%	712%	1,121	0.19%	152,465	0.21%	**52.2%**	7.35%	0.75%	0.10%
Rancho Cucamonga	4,478	1	134	234%	234%	448	0.07%	78,100	0.11%	**51.8%**	5.73%	0.60%	Not Reported
Moreno Valley	8,221	1	245	236%	236%	822	0.14%	109,642	0.15%	**51.6%**	7.50%	1.11%	Not Reported
Roseville	87,162	11	4,569	91%	91%	8,716	1.46%	1,569,010	2.17%	**51.4%**	5.56%	0.61%	0.39%
Azusa	20,840	2	1,897	10%	10%	2,084	0.35%	291,564	0.40%	**50.6%**	7.15%	0.76%	0.76%
Merced	36,195	4	142	2449%	2449%	3,619	0.61%	575,253	0.80%	**50.3%**	6.29%	0.73%	0.04%
Imperial Irr. Dist.	450,666	61	2,093	2054%	2054%	45,067	7.54%	4,770,952	6.61%	**50.1%**	9.45%	1.08%	0.07%
LADWP (3)	2,026,000	420	16,561	1711%	1123%	202,600	33.91%	25,927,000	35.93%	**50.0%**	7.81%	0.81%	0.07%
SVP	257,620	30	4,687	450%	450%	25,762	4.31%	3,356,218	4.65%	**50.0%**	7.68%	0.82%	0.19%
Modesto Irr. Dist.	138,557	16	3,222	330%	330%	13,856	2.32%	3,452,432	4.78%	**50.0%**	4.01%	0.45%	0.12%
Truckee Donner	10,014	1	47	2037%	2037%	1,001	0.17%	184,710	0.26%	**49.3%**	5.42%	0.59%	0.03%
Needles	8,173	1	18	4498%	4498%	817	0.14%	79,200	0.11%	**49.0%**	10.32%	1.12%	0.03%
Turlock Irr. Dist.	139,990	16	6,883	14%	103%	13,999	2.34%	2,335,702	3.24%	**47.5%**	5.99%	0.65%	0.38%
Colton	26,254	3	943	178%	178%	2,625	0.44%	488,634	0.68%	**37.3%**	5.37%	0.61%	0.28%
Biggs	1,063	0	35	206%	206%	106	0.02%	18,701	0.03%	**36.2%**	5.68%	0.59%	0.18%
Lodi	20,001	2	889	125%	125%	2,000	0.33%	557,864	0.77%	**29.6%**	3.59%	0.39%	0.20%
Lassen	7,333	1	77	847%	847%	733	0.12%	167,596	0.23%	**28.9%**	4.38%	0.47%	0.06%
Banning	8,734	1	96	813%	813%	873	0.15%	197,618	0.27%	**24.9%**	4.42%	0.48%	0.07%
Plumas Sierra	6,209	1	90	589%	589%	621	0.10%	202,378	0.28%	**23.5%**	3.07%	0.33%	0.06%
Healdsburg	1,984	0	5	4118%	4118%	198	0.03%	84,864	0.12%	**16.8%**	2.34%	0.24%	Not Reported
Gridley	917	0	10	850%	850%	92	0.02%	47,227	0.07%	**14.3%**	1.94%	0.21%	0.03%
Ukiah	1,979	0	22	820%	820%	198	0.03%	131,296	0.18%	**11.2%**	1.51%	0.16%	0.02%
Alameda	7,605	1	279	172%	172%	760	0.13%	469,700	0.65%	**11.1%**	1.62%	0.17%	0.07%
Shasta Lake	1,292	0	37	249%	249%	129	0.02%	82,347	0.11%	**9.78%**	1.57%	0.16%	0.02%
Trinity	0	0	22	-100%	-100%	0	0.00%	105,301	0.15%	**0.00%**	0.00%	0.00%	0.03%
Palo Alto (5)	32,800	2	1,877	33%	75%	3,280	0.55%	1,004,307	1.39%	**n/a**	3.27%	0.33%	0.20%
Redding (6)	42,549	18	3,965	-24%	7%	4,255	0.71%	953,329	1.32%	**n/a**	4.46%	0.49%	0.51%
Vernon (7)	Not Reported	Not Reported	44	n/a	n/a	Not Reported	n/a	1,306,313	1.81%	**n/a**	n/a	n/a	0.00%
TOTAL	**5,974,508**	**1,232**	**169,303**	**238%**	**253%**	**597,451**	**100%**	**72,168,489**	**100%**	**54.63%**	**8.28%**	**0.89%**	**0.28%**

Notes:

(1) 2016 energy savings targets, 2016 demand reduction targets, annual savings additions, 2016 energy forecasts, and 2016 economic potential are from the spreadsheet used to develop: CMUA, *Establishing Energy Efficiency Targets: A Public Power Response to AB 2021*, June 2007, obtained via personal communication with Scott Tomashefsky of NCPA, July 6, 2007, unless otherwise noted. Annual savings "additions" are the incremental savings in a given year from new energy efficiency program activity. Energy savings in 2016 are the cumulative annual savings in the year 2016 resulting from the programs conducted from 2007 through 2016.
(2) Reported FY 2005-06 energy savings are from: CMUA, NCPA, and SCPPA, *Energy Efficiency in California's Public Power Sector: A Status Report,* December, 2006.
(3) LADWP targets and the 2016 energy forecast for LADWP were obtained from Cynthia Rogers of the CEC in a personal email communication August 13, 2007
(4) SMUD targets were obtained from Jim Parks of SMUD in a personal communication July 31, 2007; the forecast 2016 SMUD energy use is from: CEC, California Energy Demand 2008-2018, Staff Draft Forecast, CEC-200-
(5) The City of Palo Alto targets and 2016 energy use forecast were obtained from a personal communication with Karl Knapp of Palo Alto Utilities July 31, 2007;
(6) Redding Electric Utility targets and forecast 2016 energy use are from: Nexant, *Redding Electric Potential Study*, 2007. Energy efficiecny targets were estimated by Gary Klein of the CEC using Figure 1 in the report.
(7) Vernon's 2016 energy forecast was estimated using 2005 total sales data from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html, and applying the energy sales growth rates for the SCE service territory from: CEC, *California Energy Demand 2008-2018*, Staff Draft Forecast, CEC-200-2007-015SD, July, 2007.
(8) 2005 energy sales data are from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html.

Table A-6: Publicly Owned Utilities Sorted By Average Annual Additions as % Increase From 2006 Additions

Utility	2016 Energy Savings Target (1)	2016 Demand Reduction Target (1)	Reported FY 2005-06 EE Savings (2)	2007 Energy Target Increase Compared to FY 2005-06 Reported Savings	Average Annual Savings Additions Compared to 2006 Energy Savings	Average Annual Savings Additions (1)	2016 Target as % of Total POU Target	2016 Energy Use Forecast (1)	Percentage of 2016 POU Energy Use	2016 Target as % of 2016 Economic Potential (1)	2016 Cumulative Target as % of 2016 Energy Forecast	Average Annual Savings as % of Average Annual Energy Use	FY 2005-06 EE Savings as % of 2005 Energy Use (2)(8)
	(MWh)	(MW)	(MWh)	(%)	(%)	(MWh/yr)	(%)	(MWh)	(%)	(%)	(%)	(%)	(%)
Hercules	1,364	0	0	296427%	**296427%**	136	0.02%	18,151	0.03%	54.27%	7.51%	0.79%	Not Reported
Needles	8,173	1	18	4498%	**4498%**	817	0.14%	79,200	0.11%	48.96%	10.32%	1.12%	0.03%
Healdsburg	1,984	0	5	4118%	**4118%**	198	0.03%	84,864	0.12%	16.78%	2.34%	0.24%	Not Reported
Corona	4,669	1	13	3536%	**3536%**	467	0.08%	89,178	0.12%	52.84%	5.24%	0.60%	0.01%
Merced	36,195	4	142	2449%	**2449%**	3,619	0.61%	575,253	0.80%	50.26%	6.29%	0.73%	0.04%
Imperial Irr. Dist.	450,666	61	2,093	2054%	**2054%**	45,067	7.54%	4,770,952	6.61%	50.08%	9.45%	1.08%	0.07%
Truckee Donner	10,014	1	47	2037%	**2037%**	1,001	0.17%	184,710	0.26%	49.28%	5.42%	0.59%	0.03%
LADWP (3)	2,026,000	420	16,561	1711%	**1123%**	202,600	33.91%	25,927,000	35.93%	50.04%	7.81%	0.81%	0.07%
Gridley	917	0	10	850%	**850%**	92	0.02%	47,227	0.07%	14.31%	1.94%	0.21%	0.03%
Lassen	7,333	1	77	847%	**847%**	733	0.12%	167,596	0.23%	28.94%	4.38%	0.47%	0.06%
Ukiah	1,979	0	22	820%	**820%**	198	0.03%	131,296	0.18%	11.25%	1.51%	0.16%	0.02%
Banning	8,734	1	96	813%	**813%**	873	0.15%	197,618	0.27%	24.86%	4.42%	0.48%	0.07%
Lompoc	11,210	1	138	712%	**712%**	1,121	0.19%	152,465	0.21%	52.17%	7.35%	0.75%	0.10%
Riverside	240,380	22	3,117	612%	**671%**	24,038	4.02%	2,587,000	3.58%	61.14%	9.29%	1.00%	0.16%
Plumas Sierra	6,209	1	90	589%	**589%**	621	0.10%	202,378	0.28%	23.49%	3.07%	0.33%	0.06%
SVP	257,620	30	4,687	450%	**450%**	25,762	4.31%	3,356,218	4.65%	50.03%	7.68%	0.82%	0.19%
Modesto Irr. Dist.	138,557	16	3,222	330%	**330%**	13,856	2.32%	3,452,432	4.78%	50.02%	4.01%	0.45%	0.12%
Pasadena	181,260	22	4,501	11%	**303%**	18,126	3.03%	1,452,040	2.01%	100.00%	12.48%	1.33%	0.38%
Shasta Lake	1,292	0	37	249%	**249%**	129	0.02%	82,347	0.11%	9.78%	1.57%	0.16%	0.02%
Moreno Valley	8,221	1	245	236%	**236%**	822	0.14%	109,642	0.15%	51.57%	7.50%	1.11%	Not Reported
Rancho Cucamonga	4,478	1	134	234%	**234%**	448	0.07%	78,100	0.11%	51.82%	5.73%	0.60%	Not Reported
Biggs	1,063	0	35	206%	**206%**	106	0.02%	18,701	0.03%	36.21%	5.68%	0.59%	0.18%
Colton	26,254	3	943	178%	**178%**	2,625	0.44%	488,634	0.68%	37.29%	5.37%	0.61%	0.28%
Alameda	7,605	1	279	172%	**172%**	760	0.13%	469,700	0.65%	11.12%	1.62%	0.17%	0.07%
Lodi	20,001	2	889	125%	**125%**	2,000	0.33%	557,864	0.77%	29.60%	3.59%	0.39%	0.20%
SMUD (4)	1,784,000	518	84,963	-18%	**110%**	178,400	29.86%	13,870,000	19.22%	62.57%	12.86%	1.43%	0.81%
Turlock Irr. Dist.	139,990	16	6,883	14%	**103%**	13,999	2.34%	2,335,702	3.24%	47.49%	5.99%	0.65%	0.38%
Burbank	113,073	24	5,574	103%	**103%**	11,307	1.89%	1,241,816	1.72%	62.34%	9.11%	0.95%	0.51%
Roseville	87,162	11	4,569	91%	**91%**	8,716	1.46%	1,569,010	2.17%	51.36%	5.56%	0.61%	0.39%
Palo Alto (5)	32,800	2	1,877	33%	**75%**	3,280	0.55%	1,004,307	1.39%	n/a	3.27%	0.33%	0.20%
Glendale	113,620	13	8,463	34%	**34%**	11,362	1.90%	1,140,000	1.58%	63.47%	9.97%	1.00%	0.77%
Anaheim	167,682	35	12,766	25%	**31%**	16,768	2.81%	2,941,017	4.08%	52.82%	5.70%	0.60%	0.50%
Azusa	20,840	2	1,897	10%	**10%**	2,084	0.35%	291,564	0.40%	50.59%	7.15%	0.76%	0.76%
Redding (6)	42,549	18	3,965	-24%	**7%**	4,255	0.71%	953,329	1.32%	n/a	4.46%	0.49%	0.51%
Oakland	8,837	1	879	1%	**1%**	884	0.15%	108,238	0.15%	71.70%	8.16%	0.93%	Not Reported
Trinity	0	0	22	-100%	**-100%**	0	0.00%	105,301	0.15%	0.00%	0.00%	0.00%	0.03%
Island Energy	1,777	0	Not Reported	n/a	**n/a**	178	0.03%	21,326	0.03%	78.81%	8.33%	0.91%	Not Reported
Vernon (7)	Not Reported	Not Reported	44	n/a	**n/a**	Not Reported	n/a	1,306,313	1.81%	n/a	n/a	n/a	0.00%
TOTAL	**5,974,508**	**1,232**	**169,303**	**238%**	**253%**	**597,451**	**100.00%**	**72,168,489**	**100.00%**	**54.63%**	**8.28%**	**0.89%**	**0.28%**

Notes:

(1) 2016 energy savings targets, 2016 demand reduction targets, annual savings additions, 2016 energy forecasts, and 2016 economic potential are from the spreadsheet used to develop: CMUA, *Establishing Energy Efficiency Targets: A Public Power Response to AB 2021*, June 2007, obtained via personal communication with Scott Tomashefsky of NCPA, July 6, 2007, unless otherwise noted. Annual savings "additions" are the incremental savings in a given year from new energy efficiency program activity. Energy savings in 2016 are the cumulative annual savings in the year 2016 resulting from the programs conducted from 2007 through 2016.
(2) Reported FY 2005-06 energy savings are from: CMUA, NCPA, and SCPPA, *Energy Efficiency in California's Public Power Sector: A Status Report*, December, 2006.
(3) LADWP targets and the 2016 energy forecast for LADWP were obtained from Cynthia Rogers of the CEC in a personal email communication August 13, 2007
(4) SMUD targets were obtained from Jim Parks of SMUD in a personal communication July 31, 2007; the forecast 2016 SMUD energy use is from: CEC, California Energy Demand 2008-2018, Staff Draft Forecast, CEC-200-
(5) The City of Palo Alto targets and 2016 energy use forecast were obtained from a personal communication with Karl Knapp of Palo Alto Utilities July 31, 2007;
(6) Redding Electric Utility targets and forecast 2016 energy use are from: Nexant, *Redding Electric Potential Study*, 2007. Energy efficiecny targets were estimated by Gary Klein of the CEC using Figure 1 in the report.
(7) Vernon's 2016 energy forecast was estimated using 2005 total sales data from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html, and applying the energy sales growth rates for the SCE service territory from: CEC, *California Energy Demand 2008-2018*, Staff Draft Forecast, CEC-200-2007-015SD, July, 2007.
(8) 2005 energy sales data are from: EIA, Form 861, www.eia.doe.gov/cneaf/electricity/page/eia861.html.

Attachment B: Discussion of Comparative Metrics

NRDC used three primary metrics in our evaluation and comparison of the proposed POU targets. Since each of the metrics has strengths and drawbacks, our analysis relies on the relative ranking of the POUs using each of the metrics. This Attachment discusses the merit of each of these three metrics:

1. 2016 energy efficiency target (MWh) as percentage of forecast 2016 energy use;
2. 2016 energy efficiency target as percentage of economic energy efficiency potential;
3. Average annual energy efficiency additions (MWh) as percentage of 2006 annual additions.

We believe the first metric, each POU's 2016 energy saving target as a percent of forecast 2016 energy use, is the most valuable comparative metric. This type of metric is commonly used in the energy efficiency industry to compare how aggressive different states and utilities are in pursuing energy efficiency. The metric is valuable in part because it normalizes each POUs' energy saving target with forecasts of energy use, which is a relatively straightforward value that is often thoroughly vetted and widely accepted. In addition, historical comparisons are easier to make since actual energy consumption is known. This metric also allows for a direct comparison of targets across utilities, regardless of the assumptions that went into the potential study that informed the targets.

The second metric, 2016 energy efficiency target as percentage of economic energy efficiency potential, is useful for providing another gauge of the relative aggressiveness of the targets, but it is more dependent on the various assumptions and the methodology involved in estimating economic potential. Estimates of economic energy efficiency potential depend on assumptions regarding avoided costs, discount rates, measure costs, energy efficiency measure saturations, etc. While most POUs used one joint potential study conducted by the Rocky Mountain Institute (RMI), some of the larger POUs, such as LADWP and SMUD, and the IOUs used potential studies conducted by other expert consultants. One particular difference between the RMI and the other studies – a difference in reporting net versus gross potential – makes it difficult to use this metric to compare IOU and POU targets. The most recent IOU energy efficiency potential study completed by Itron in 2006 reports *gross* potentials. The CMUA Report, based on the RMI potential study, provides *net* potentials. Therefore, this metric is most useful in comparing targets among the POUs that used the RMI potential study, and is less valuable to compare the POUs with the IOUs.

The third metric is average annual energy efficiency additions as percentage of annual reported additions in 2006. This metric provides an indication of how much a utility is planning to "ramp up" its energy efficiency efforts compared to its past performance. While this metric is useful for highlighting those utilities that are planning to "most improve" their efforts, it does not illuminate, in an absolute sense, the most aggressive utility targets. In particular, a utility that has been aggressively pursuing energy efficiency programs in the past and therefore does not need to significantly increase its savings would rank low using this metric. Conversely, a utility that has not been investing significantly in energy efficiency could rank high using this metric with only a modest increase in its efforts.