



A Navigant Consulting Project

Local Energy Efficiency Program Workbook

Technical Addendum

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The California Local Energy Efficiency Program (CALeep) was funded by California utility ratepayers under the auspices of the California Public Utilities Commission (CPUC). California consumers are not obligated to purchase any full-fee service or other service not funded by this program.

Los consumidores en California no están obligados a comprar servicios completos o adicionales que no esten cubiertos bajo este programa. Este programa está financiado por los usuarios de servicios públicos en California bajo la jurisdicción de la Comisión de Servicios Públicos de California (CPUC).

For additional information about this program or workbook, please contact: Eric Olson at eolson@navigantconsulting.com. Or visit www.caleep.com to learn about the background of the project and a description of the participants.

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1. Energy Efficiency in California

This addendum supplements the CALeep Workbook by addressing some of the fundamentals of local government implementation of energy efficiency in California. It answers the questions: What is energy efficiency? Why am I interested? How do I incorporate energy efficiency in regional planning?

A History of Energy Efficiency in California

California's local governments need to be informed about, and incorporate energy efficiency into regional planning. Funding for energy efficiency programs is provided by ratepayers when they pay surcharges included in monthly electricity and natural gas utility bills. The following brief history of energy efficiency surcharge spending and program activities describes how energy efficiency became a major factor in the state's economic welfare. Thirty-five years of energy efficiency spending and program activities in California have been motivated by four causes: (1) dependence on foreign oil, (2) environmental impacts of energy supply, (3) electric utility industry restructuring, and (4) the California energy crisis and resulting California Energy Action Plan.

Dependence on Foreign Oil

In 1973, following the 1972 Middle East oil embargo, the California Public Utilities Commission (CPUC) issued directives for utilities to activate plans for conservation, mandatory curtailments, and voluntary reductions. In early 1974, six Middle East oil-producing nations doubled their oil prices. In May 1974, the Warren-Alquist Act established the Energy Resources Conservation and Development Commission referred to as the California Energy Commission (CEC). Between 1972 and 1977, based on CPUC directives, California's investor owned energy utilities (IOU) expanded their conservation efforts. The 1977 conservation expenses were approximately \$25 million. Conservation efforts continued to escalate through the late '70s and early '80s, peaking in 1984 at approximately \$138 million*. The first cash rebates were introduced in 1982.

Decreasing oil prices in the mid and late 1980s made conservation measures less cost-effective than in previous years. Producing a unit of energy was less costly than saving one. Projected excess capacity through the 1990s deferred some energy efficiency programs, so that 1988 conservation expenses were approximately \$68 million**.

Environmental Impacts of Energy Supply (*Call for Integrated Resource Planning*)

In 1989, an article in the Los Angeles Times accused California's IOUs of departing from the conservation ethic. In July, the CPUC "en banc" hearing addressed the issue of decreased conservation spending. California's IOUs, the CEC, CPUC and various advocacy groups met for six months. During this period, known as the "Collaborative Process," the principles behind utility earnings as an incentive for utilities to increase conservation spending were developed. In 1990, the CPUC approved an earnings

* CEC Staff Report 400-03-022D; estimated funding is nominal \$ not adjusted for inflation.

** Ibid

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mechanism enabling IOUs to earn 5 percent on program expenses based on achieving energy (kWh) savings goals; 1990 conservation expenses were approximately \$165 million. In 1992, the CPUC redefined a “Shared Savings” earnings mechanism, enabling IOUs to earn approximately 10 percent on program expenses if they achieved minimum goals.

Goals were stated in terms of the value of energy saved based on avoiding the cost to generate and distribute the energy. The 1994 conservation expenses were approximately \$247 million*.

Electric Industry Restructuring

California's electric utility industry restructuring began following passage of the federal Energy Policy Act of 1992, and energy-efficiency funding began its second down-turn. The CPUC developed restructuring strategies during 1993 and 1994 and issued its Preferred Policy Decision (D.95-12-063) on December 20, 1995**. Electric utility restructuring legislation was chaptered into law on September 24, 1996. During the three years of industry restructuring, energy efficiency funding fell 35 percent from \$247 million in 1994 to \$161 million in 1997. Restructuring legislation and other regulation addressed the decline in funding and established minimum funding levels for the California IOUs and publicly owned electric utility energy efficiency funding***. Legislated 1998, 1999 and 2000 IOU funding levels were \$228 million.

* In 1994, CPUC Decision D.92-09-080 ordered DSM bidding to be implemented. The DSM bidding pilot tested the effectiveness of third-party contractor Energy Service Companies (ESCOs) to replace IOU conservation programs. Since that time, non-utility implementation of energy efficiency programs has been part of California energy efficiency to a greater or lesser degree.

** CPUC presented four strategies for reform (Yellow Report 2/3/93); reduced these to two preferred and alternative proposed policies (Blue Book R.94-04-031/I.04-04-032); received comments filed by 113 individuals and organizations; conducted five full panel hearings and held public participation hearings in 16 cities; on 12/7/94, created a working group of 123 organizations; on 5/24/95, issued D.95-05-045, accompanied by the preferred and alternative policy decision; sought comments and held more hearings. The CPUC issued its Preferred Policy Decision (D.95-12-063), dated December 20, 1995, as modified by D.96-01-009, dated January 10, 1996, and issued January 12, 1996 in Docket R.94-04-031.

*** Electric Industry restructuring legislation Assembly Bill 1890 (Brulte, 1996) was codified in Public Utilities Code (PU Code) under Division 1, Part 1, Chapter 2.3. Electrical Restructuring. Under Article 7 Research, Environmental, and Low-Income Funds, Section 381 directed the CPUC to require each IOU to identify a separate rate component to collect revenues used to fund cost-effective energy efficiency and conservation activities. Herein the IOUs were directed to fund not less than the following levels commencing January 1998 through 2001 (\$ million):

	1998	1999	2000	2001	Total
Total	\$228	\$228	\$228	\$188	\$872

Article 8, Section 385 (a) directed each local publicly owned electric utility to establish a non-bypassable, usage-based charge on local distribution service of not less than the lowest expenditure level of the three largest IOUs on a percent of revenue basis (approximately 3%).

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The California Energy Crisis

California electric supply deregulation (*restructuring*) included implementation of a flawed market structure where (1) IOU rates were frozen at 1996 levels, (2) IOU generation assets were sold to private companies and (3) IOUs were required to buy all energy supplies through a day-ahead spot market (California Power Exchange). When weather and hydro-electric generation conditions helped to create a scarcity of energy supply, the markets became vulnerable to price manipulation. Wholesale energy prices soared in mid-2000 and the IOUs were forced to absorb the cost and maintain power delivery at the frozen rates. The IOUs depleted their cash and credit reserves and IOU credit ratings fell below the Power Exchange credit requirements.

Energy supply imbalances in the year 2000 resulted in rolling blackouts across California that shut down traffic lights, darkened schools and closed businesses. The governor ordered local police to patrol the streets – not for criminals, but to make sure businesses kept their lights dimmed. In January 2001, the Independent System Operator (ISO) that manages the state's electric transmission grid stated that unless California businesses and residences dramatically curtailed their energy usage, blackouts would continue.* The California Power Exchange suspended its market operations on January 30, 2001. Failure of the California Power Exchange, and insolvency and bankruptcy of the largest IOUs, caused the State's Department of Water Resources to step in to buy power for the crippled IOUs.

Leading up to summer 2001, after a disastrous year 2000, the CEC administered energy efficiency program funding linked to the passage of Assembly Bill 29 X and Senate Bill 5X, totaling \$362 million. In the summer of 2001, peak demand was reduced by at least 3,000 megawatts owing to increased consumer awareness and program spending.

The Energy Action Plan

Following the biggest electricity and natural gas crisis in its history, California – the fifth largest economy in the world – recognized that the state's economic prosperity and quality of life were increasingly reliant upon dependable, high quality, and reasonably priced energy. In April 2003, the state's principal energy agencies created a joint Energy Action Plan with the following goal:

Ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers

* ISO managing director Jim Detmers, January 18, 2001. Existing barriers may impede local governments from undertaking energy efficiency.

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To ensure such energy supplies are achieved, the state requires significant development of its energy infrastructures, including increased capacity in natural gas transport pipelines and storage facilities, increased and updated electric generation facilities, and expansion of its electric transmission system. None of these will be achieved in the near term and energy efficiency, having just proven itself viable in the summer of 2001, came to the forefront as the most expedient and least-cost energy resource alternative. The Energy Action Plan identified six actions of critical importance to be undertaken immediately in a sequential loading order:

- » Optimize Energy Conservation and Resource Efficiency
- » Accelerate the State's Goal for Renewable Generation
- » Ensure Reliable, Affordable Electricity Generation
- » Update and Expand the Electricity Transmission and Distribution Infrastructure
- » Promote Customer and Utility Owned Distributed Generation
- » Ensure Reliable Supply of Reasonably Priced Natural Gas

Consistent with the Energy Action Plan's first action in its loading order, the CPUC implemented regulation authorizing energy efficiency spending increases and requiring its jurisdictional energy utilities to dramatically increase their energy efficiency program activities.

The following graph shows 35 years of energy efficiency program spending with major spending influences.

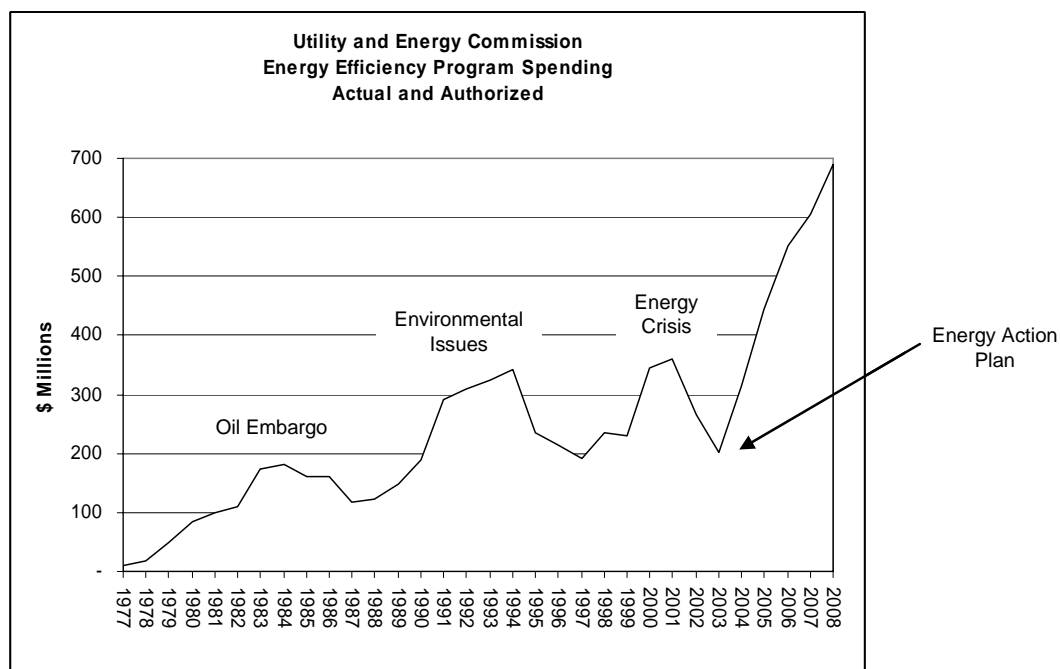


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2. Implications for Local Governments

Implications for Local Governments

Local Governments need to be aware of the costs that it and its constituents are paying to support the state's energy efficiency investments. Only when government is aware, engaged and participating can it ensure a return for these investments. The following table shows the average electric energy use, utility bill and energy efficiency surcharge payments made, by customer sector, for California's 477 cities:

Average California City

Sectors	Annual kWh	Utility Bills	2006 EE Bill Surcharges
Residential	139,959,018	\$16,278,512	\$792,026
Small Commercial	34,469,146	\$5,442,654	\$195,060
Medium Commercial	129,537,172	\$14,723,900	\$733,049
Industrial	94,319,251	\$7,690,816	\$533,752
Agriculture & Pumping	26,898,344	\$3,343,567	\$152,217
Total	425,182,932	\$47,479,449	\$2,406,105

If a local government (and/or its constituents) spent half again as much as it paid in EE surcharges (i.e., \$1.2 million) and, participating in the existing EE programs, implemented a typical energy efficiency measures mix, it could achieve up to six times its expenditure in regional benefits.

Let's look at an example. Assume that:

- » The EE measures are such that approximately 50% of the energy savings would come from lighting retrofits and 50% from air conditioning, heating and ventilation (HVAC) system upgrades.
- » On average, rebates from the existing EE programs cover half of the additional cost to implement the EE measures, bringing the total expenditure on EE measures up to \$2,406,105.
- » The savings from the mix of measures last about 16 years, thereby producing 16 years worth of energy savings.

The results could be as follows:

2. Implications for Local Governments

Economic Impacts

Annual Bill Impacts	\$1,446,260
EE project Costs Retained in Local Economy	\$2,045,189
Economic Multiplier Effect (2.23:1)	\$4,560,771
Employment (# of jobs)	132

The annual bill savings of \$1.4 million would repay the initial \$1.2 million investment back within a year of installing the measures.

From the energy savings repeating each year for 16 years, a present-value benefit of \$15.7 million would be achieved (assuming a discount rate of 5%)*. Not every local community could necessarily implement the specific EE measures modeled here, but even at half or one third of the savings, this is a substantial economic impact and doesn't include the type of boon to the local economy from retaining EE project costs in the local economy, nor the economic multiplier effect of those project costs.

Whether a community elects to take any action to pursue these benefits, the community's local government facilities, residences and businesses will pay the energy efficiency surcharges. Clearly, it is incumbent upon local government to act decisively to help the community capture the maximum amount of energy efficiency funding and technical support.

* This estimate is illustrative only and makes favorable assumptions about the types of measures to be installed. However, even if the measures saved half as much or cost twice as much, the payback period would be within two years, the present value of the 16 years of savings would be \$7.8 million, and 66 jobs could be created.

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3. Access to Energy Efficiency Resources

Local Government Access to Energy Efficiency Resources – Where the Resources Are and How You Get Them

Given the economic justification and motivation for engagement in the state’s energy efficiency initiatives, it is helpful to understand how resources are channeled back to energy ratepayers and what role local government can take in ensuring equitable access to these resources by both the government and its constituents.

Energy efficiency funding is channeled back to ratepayers through programs that provide the financial and/or technical assistance to implement measures resulting in reduced energy consumption by end-users. The following basic terms apply:

Energy: As referred to below, electric energy expressed as kilowatt hours (kWh) or natural gas energy expressed as therms (100,000 Btu).

Energy Efficiency: Measures taken to reduce the amount of energy required to perform the same amount of work.

Energy Efficiency Measures: Products or practices to reduce energy usage while maintaining a comparable level of service (typically implemented on the customer side of the meter) – for example, permanent replacement of energy-using equipment with more efficient equipment.

Energy Efficiency Programs: Programs that reduce customer energy use by promoting energy efficiency investments or adoption.

At the highest level all energy efficiency programs or projects fall into one of four basic categories. These categories represent 80 percent of 2006-2008 EE program funding resulting from energy efficiency surcharges on energy bills, as shown below:

	New Construction	Retrofit
Residential	\$ 70 million (3.5%)	\$ 657 million (33.4%)
Nonresidential	\$ 89 million (4.5%)	\$ 688 million (34.9%)

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The remaining 20% includes initiatives that include combination programs targeting both residential and nonresidential programs (termed cross-cutting programs) as well as marketing and outreach (informational) programs, programs providing education and training, programs focusing on emerging technologies and activities to establish and update California's Title-20 Appliance and Title-24 Building Energy Efficiency Standards.

In addition to direct program costs, the cost to verify program activities and impacts (termed evaluation, measurement and verification or EM&V), account for 7.7 percent of energy utility total energy efficiency activity costs.

Combined CPUC Jurisdictional Energy Utilities EE Funding

CPUC Decision D.05-09-043, ATTACHMENT 4: PROGRAM BUDGETS AND PROJECTED SAVINGS

<u>Generic Category</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>Total</u>
Residential Retrofit	\$189,867,797	\$217,013,456	\$250,092,210	\$656,973,462
Residential New Construction	\$20,429,162	\$23,029,097	\$26,309,717	\$69,767,976
Nonresidential Retrofit	\$201,460,844	\$224,263,076	\$261,866,097	\$687,590,018
Nonresidential New Construction	\$24,149,938	\$28,682,705	\$36,191,810	\$89,024,453
Agricultural Programs	\$24,119,551	\$26,376,764	\$35,089,650	\$85,585,965
Mixed	\$17,330,351	\$17,330,351	\$17,330,351	\$51,991,053
Mixed New Construction	\$2,025,969	\$2,292,121	\$2,705,890	\$7,023,980
Third-Party	\$44,024,365	\$48,459,022	\$53,449,545	\$145,932,932
Marketing & Outreach	\$20,528,085	\$20,528,085	\$20,528,085	\$61,584,255
Education & Training	\$22,942,700	\$23,705,044	\$24,273,357	\$70,921,101
Emerging Technologies	\$9,764,000	\$9,902,440	\$10,113,177	\$29,779,617
Codes & Standards	<u>\$4,043,500</u>	<u>\$4,206,287</u>	<u>\$4,337,844</u>	<u>\$12,587,631</u>
Totals	\$580,686,262	\$645,788,448	\$742,287,733	\$1,968,762,443
Evaluation, Measurement & Verification	<u>\$47,956,836</u>	<u>\$53,606,929</u>	<u>\$61,771,788</u>	<u>\$163,335,553</u>
Total	\$628,643,098	\$699,395,377	\$804,059,521	\$2,132,097,996

3. Access to Energy Efficiency Resources

Where's the Money?

To assist local government in tracking down and obtaining the benefit from energy efficiency program funding, the following tables show program plans within each of the IOUs, with the utility program names and proposed funding levels:

<u>Program Type</u>	<u>Southern California Edison Programs</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>Total</u>
Residential Retrofit	Appliance Recycling	\$12,301,351	\$13,291,900	\$14,292,700	\$39,885,951
	Residential EE Rebates	\$21,096,248	\$22,698,565	\$23,506,844	\$67,301,657
	Multifamily Rebates	\$17,819,229	\$17,651,334	\$17,694,803	\$53,165,366
	Home Energy Efficiency Surveys	\$2,318,380	\$1,818,100	\$1,828,800	\$5,965,280
	Comprehensive HVAC - Residential	<u>\$4,471,302</u>	<u>\$4,471,302</u>	<u>\$4,471,302</u>	<u>\$13,413,906</u>
	total	\$58,006,510 26.8%	\$59,931,201 26.6%	\$61,794,449 26.5%	\$179,732,160 26.6%
Residential New Construction	California New Homes	\$6,021,673 2.8%	\$6,125,343 2.7%	\$6,185,143 2.7%	\$18,332,159 2.7%
Nonresidential Retrofit	Integrated Schools	\$1,544,858	\$1,638,300	\$1,805,000	\$4,988,158
	Comprehensive HVAC - Nonresidential	\$15,744,580	\$15,744,580	\$15,744,580	\$47,233,740
	Retro Commissioning	\$1,548,850	\$5,107,850	\$5,099,350	\$11,756,050
	Industrial Process	\$13,271,370	\$13,127,531	\$14,136,215	\$40,535,116
	Agricultural Energy Efficiency	\$10,133,550	\$11,515,264	\$16,414,020	\$38,062,834
	Small Business Direct Install	\$16,133,486	\$16,133,486	\$16,133,486	\$48,400,458
	Business Incentive Program	<u>\$36,243,641</u>	<u>\$35,868,746</u>	<u>\$33,810,917</u>	<u>\$105,923,304</u>
	total	\$94,620,335 43.7%	\$99,135,757 44.0%	\$103,143,568 44.2%	\$296,899,660 44.0%
Nonresidential New Construction	Savings by Design	\$8,618,503 4.0%	\$10,327,770 4.6%	\$11,986,498 5.1%	\$30,932,771 4.6%
Other	Cross-Cutting	\$28,975,717	\$29,062,842	\$29,324,562	\$87,363,121
	Marketing & Outreach (Flex Your Power)	\$6,737,838	\$6,737,838	\$6,737,838	\$20,213,514
	Education & Training	\$8,025,500	\$8,025,500	\$8,025,500	\$24,076,500
	Emerging Technologies	\$3,729,000	\$3,794,000	\$3,907,240	\$11,430,240
	Codes & Standards	<u>\$1,839,000</u>	<u>\$1,971,697</u>	<u>\$2,041,180</u>	<u>\$5,851,877</u>
	total	\$49,307,055 22.8%	\$49,591,877 22.0%	\$50,036,320 21.5%	\$148,935,252 22.1%
	Total Energy Efficiency Programs	\$216,574,076 100.0%	\$225,111,948 100.0%	\$233,145,978 100.0%	\$674,832,002 100.0%
EM&V		\$17,325,926	\$18,008,956	\$18,651,678	\$53,986,560
Total Energy Efficiency Expenditures		\$233,900,002	\$243,120,904	\$251,797,656	\$728,818,562

<u>Program Type</u>	<u>San Diego Gas & Electric Programs</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>Total</u>
Residential Retrofit	Upstream Lighting Program	\$5,144,767	\$5,625,425	\$6,107,671	\$16,877,863
	Lighting Exchange and Education	\$500,000	\$516,730	\$533,600	\$1,550,330
	Limited Income Refrigerator Replacement	\$1,090,520	\$1,090,520	\$1,090,520	\$3,271,560
	Multi-Family Rebate Program	\$2,155,159	\$2,258,557	\$2,364,428	\$6,778,144
	Single Family Rebate Program	<u>\$2,466,891</u>	<u>\$2,581,818</u>	<u>\$2,640,249</u>	<u>\$7,688,958</u>
	total	\$11,357,337 15.1%	\$12,073,050 14.3%	\$12,736,468 13.0%	\$36,166,855 14.0%
Residential New Construction	Advanced Home Program	\$2,213,250 2.9%	\$2,213,250 2.6%	\$2,213,250 2.3%	\$6,639,750 2.6%
Nonresidential Retrofit	Energy Savings Bids	\$11,733,071	\$16,367,338	\$22,842,880	\$50,943,289
	Express Efficiency Rebate Program	\$3,082,498	\$3,313,685	\$3,562,212	\$9,958,395
	Small Business Super Saver	\$9,579,085	\$10,297,516	\$11,069,830	\$30,946,431
	Standard Performance Program	<u>\$3,382,612</u>	<u>\$3,636,308</u>	<u>\$3,909,031</u>	<u>\$10,927,951</u>
	total	\$27,777,266 37.0%	\$33,614,847 39.7%	\$41,383,953 42.3%	\$102,776,066 39.9%
Nonresidential New Construction	Savings by Design	\$3,323,540 4.4%	\$4,225,467 5.0%	\$6,050,932 6.2%	\$13,599,939 5.3%
Other	Cross-Cutting (and third-party programs)	\$25,115,379	\$27,256,115	\$30,116,023	\$82,487,517
	Marketing & Outreach (Flex Your Power)	\$2,794,410	\$2,794,410	\$2,794,410	\$8,383,230
	Education & Training	\$791,308	\$724,900	\$682,000	\$2,198,208
	Emerging Technologies	\$1,363,000	\$1,363,000	\$1,363,000	\$4,089,000
	Codes & Standards	<u>\$400,000</u>	<u>\$400,000</u>	<u>\$400,000</u>	<u>\$1,200,000</u>
	total	\$30,464,097 40.5%	\$32,538,425 38.4%	\$35,355,433 36.2%	\$98,357,955 38.2%
Total Energy Efficiency Programs	\$75,135,490	\$84,665,039	\$97,740,036	\$257,540,565	
EM&V		\$6,010,839	\$6,773,203	\$7,819,203	\$20,603,245
Total Energy Efficiency Expenditures		\$81,146,329	\$91,438,242	\$105,559,239	\$278,143,810

3. Access to Energy Efficiency Resources

<u>Program Type</u>	<u>Pacific Gas & Electric Programs</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>Total</u>
Residential Retrofit	Mass Market - Residential	\$96,368,062 39.4%	\$118,939,725 42.6%	\$145,434,713 42.4%	\$360,742,499 41.6%
Residential New Construction	Residential New Construction	\$9,944,239 4.1%	\$11,690,504 4.2%	\$14,411,324 4.2%	\$36,046,067 4.2%
Nonresidential Retrofit	Mass Market - Nonresidential	\$24,092,015	\$29,734,931	\$36,358,678	\$90,185,625
	Industrial	\$38,789,723	\$40,178,257	\$42,872,399	\$121,840,379
	AG & Food Processing	\$13,986,001	\$14,861,500	\$18,675,630	\$47,523,131
	Commercial (Office Buildings)	\$10,510,686	\$11,342,972	\$15,045,397	\$36,899,055
	Medical	\$7,575,132	\$7,925,714	\$12,918,178	\$28,419,024
	Retail	\$5,148,264	\$5,667,321	\$8,053,199	\$18,868,784
	High Technology	\$4,870,934	\$5,136,153	\$9,330,136	\$19,337,223
	School, Colleges & Universities	\$4,510,204	\$4,448,700	\$9,432,966	\$18,391,870
	Hospitality (Lodging)	<u>\$1,581,996</u>	<u>\$1,860,632</u>	<u>\$2,532,844</u>	<u>\$5,975,472</u>
	total	\$111,064,955 45.4%	\$121,156,180 43.4%	\$155,219,427 45.2%	\$387,440,563 44.7%
Nonresidential New Construction	Not Identified	N/A	N/A	N/A	N/A
Other	Marketing & Outreach	\$8,982,794	\$8,982,794	\$8,982,794	\$26,948,382
	Education & Training	\$13,117,200	\$13,379,544	\$13,897,857	\$40,394,601
	Emerging Technologies	\$3,672,000	\$3,745,440	\$3,842,937	\$11,260,377
	Codes & Standards	<u>\$1,504,500</u>	<u>\$1,534,590</u>	<u>\$1,596,664</u>	<u>\$4,635,754</u>
	total	\$27,276,494 11.1%	\$27,642,368 9.9%	\$28,320,252 8.2%	\$83,239,114 9.6%
	Total Energy Efficiency Programs	\$244,653,750 100.0%	\$279,428,777 100.0%	\$343,385,716 100.0%	\$867,468,243 100.0%
EM&V		\$21,274,235	\$24,298,155	\$29,859,627	\$75,432,017
Total Energy Efficiency Expenditures		\$265,927,985	\$303,726,932	\$373,245,343	\$942,900,260

<u>Program Type</u>	<u>Southern California Gas Company Programs</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>Total</u>
Residential Retrofit	Multi-Family Rebate Program	\$2,500,000	\$3,000,000	\$4,000,000	\$9,500,000
	Home Efficiency Rebate Program	\$4,500,000	\$6,000,000	\$9,000,000	\$19,500,000
	Home Energy Efficiency Survey	<u>\$600,000</u>	<u>\$600,000</u>	<u>\$700,000</u>	<u>\$1,900,000</u>
	total	\$7,600,000 17.1%	\$9,600,000 17.0%	\$13,700,000 20.1%	\$30,900,000 18.3%
Residential New Construction	Advanced Home Program	\$2,250,000 5.1%	\$3,000,000 5.3%	\$3,500,000 5.1%	\$8,750,000 5.2%
Nonresidential Retrofit	Express Efficiency Rebate Program	\$5,308,050	\$7,678,996	\$9,114,191	\$22,101,237
	Local Business Energy Efficiency Program	\$6,137,264	\$9,324,108	\$11,385,568	\$26,846,940
	Energy Efficiency Delivery Channel Innovation	<u>\$1,000,000</u>	<u>\$1,000,000</u>	<u>\$1,000,000</u>	<u>\$3,000,000</u>
	total	\$12,445,314 28.1%	\$18,003,104 31.8%	\$21,499,759 31.6%	\$51,948,177 30.8%
Nonresidential New Construction	Savings by Design SCG SCE Program	\$1,500,000	\$2,500,000	\$3,500,000	\$7,500,000
	Savings by Design Muni Program	<u>\$1,000,000</u>	<u>\$1,000,000</u>	<u>\$1,000,000</u>	<u>\$3,000,000</u>
	total	\$2,500,000 5.6%	\$3,500,000 6.2%	\$4,500,000 6.6%	\$10,500,000 6.2%
Other	Cross-Cutting (and third-party programs)	\$14,414,589	\$16,866,537	\$19,153,201	\$50,434,327
	Marketing & Outreach (Flex Your Power)	\$2,013,043	\$2,013,043	\$2,013,043	\$6,039,129
	Education & Training	\$1,800,000	\$2,300,000	\$2,350,000	\$6,450,000
	Emerging Technologies	\$1,000,000	\$1,000,000	\$1,000,000	\$3,000,000
	Codes & Standards	<u>\$300,000</u>	<u>\$300,000</u>	<u>\$300,000</u>	<u>\$900,000</u>
	total	\$19,527,632 44.1%	\$22,479,580 39.7%	\$24,816,244 36.5%	\$66,823,456 39.6%
	Total Energy Efficiency Programs	\$44,322,946 100.0%	\$56,582,684 100.0%	\$68,016,003 100.0%	\$168,921,633 100.0%
EM&V		<u>\$3,345,836</u>	<u>\$4,526,615</u>	<u>\$5,441,280</u>	<u>\$13,313,731</u>
Total Energy Efficiency Expenditures		\$47,668,782	\$61,109,299	\$73,457,283	\$182,235,364

Brief descriptions of each utility's programs can be found in Attachment 3 of CPUC Decision D0509043 from September 2005. The web sites of the California investor-owned utilities provide more detailed information about the energy efficiency programs currently available. Program descriptions can also be found on the Flex Your Power web site (www.fyppower.org).

3. Access to Energy Efficiency Resources

Reserving Funds

Each program has a limited annual budget. Submit your project applications before funds run out.

IOU energy efficiency programs are generally planned and implemented with budget allocations for the given calendar year. The procedure for reserving and ultimately distributing energy efficiency program funds is unique to each program. Would-be local government participants are encouraged to read promotional literature for each program carefully regarding program requirements.

The process of implementing most programs results in a period often as short as three months at the beginning of each program year where all available funds are committed to participants through an application process. Utility customer representatives have job performance evaluation and rewards (bonuses) often tied to enrolling their assigned customers in energy efficiency programs and also to the magnitude of energy savings anticipated. This dynamic drives utility field organizations to “sand-bag” or save up applications for processing when a new program year begins. Additionally, participants from previous program years, enlightened to the process, press to ensure their projects are reviewed before program funding has been subscribed.

Such program characteristics make it critical for would-be local government program participants to identify projects well in advance of January 1st, engage the utility representatives (where applicable), and complete necessary project funding applications for submittal as early as possible following program roll-out. This will help avoid the very common frustration of finding program funds exhausted after expending a good-faith effort to plan and implement efficiency upgrades.

Direct Access Customers Are Eligible to Participate in Energy Efficiency Programs

Customers that procure the energy component of their electricity service from sources other than their distribution utility are eligible to participate in ratepayer funded energy efficiency programs. This applies to all energy efficiency programs that are made available to any utility customers.

This message is stressed for the following reason: In addition to the traditional energy efficiency program funding described above, in 2003 the CPUC ordered the California Investor Owned Utilities (IOU) to file plans to include energy efficiency as part of their long-term procurement supply portfolios for the first year, five years, and twenty years*.

* CPUC Decision D.0312062 directs IOUs to recover authorized procurement-related energy efficiency [costs] through its existing non-bypassable Public Purpose Programs Charge (PPPC), which applies to all IOU retail customers. Additionally, CPUC D.03-12-062 directs that incremental procurement energy efficiency costs be subject to recovery through a non-bypassable charge to all customers and orders IOUs to establish the Procurement Energy Efficiency and Balancing Account (PEEBA) to track costs and revenues.

3. Access to Energy Efficiency Resources

Reserving Funds (continued)

In the past, some utilities mistakenly communicated information regarding limitations on participation by customers in programs funded by these *procurement dollars*. Some customers that were procuring the energy component of their electricity service from direct access Energy Service Providers (ESP) were prohibited from submitting proposals to receive such energy efficiency funds.*

Other Funding

The funding that comes from energy efficiency surcharges on Californians' energy bills is not the only source of funding for conducting energy analyses and implementing energy efficiency projects and policies. The California Energy Commission also has funding and has assisted a number of local governments in making improvements. See Appendix B: Resources of the CALeep workbook (www.caleep.com) for additional sources of financial and other assistance.

* In SCE's Proposal Request V308402 (RFP), direct access customers were prohibited from submitting proposals for SCE's IDEEA solicitations (est. \$11 m) through the statement "direct access customers may not be served through this program" in bold at the top of page 1-6 (Section 1.5 Program Design and Implementation).

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4. Identifying EE Opportunities

Identifying Energy Efficiency Opportunities

Use of this Technical Addendum, describing the fundamentals of energy efficiency and programmatic characteristics, is supplemental to the CALeep Workbook process documented in the CALeep Workbook (see www.CALeep.com). While the CALeep Technical Addendum may be consulted before, after or during the Workbook process, it is assumed that an organization's governing ideals, values and guidelines for commitment (motivation/objectives/goals) have been, or are being, addressed elsewhere and are not discussed herein. Also, during its "process work" the local government organization should have considered what role it intends to play and whether it will address only governmental operations or serve as a conduit for energy efficiency initiatives to benefit its constituent residential and/or regional business populations.

To chart a course to available resources, you must know where the opportunities are. That means knowing where energy is currently being used and then identifying where efficiency improvements in that energy use might be cost effective.

The following local government example illustrates how to make such a general assessment of where energy is being used.

Activities: In a typical city the following energy consuming activities might take place within its jurisdictional boundaries:

1. City Hall or other administrative office buildings
2. Police Station
3. Fire Department
4. Public Utilities Department
5. Libraries
6. Parks & Recreation
7. Aligned Governmental Activities
8. Non-Governmental Activities

4. Identifying EE Opportunities

Sub-Activities: The activities can be broken-down into sub-activities each with characteristic energy use. For example, Item 4, the Public Utilities Department, might include these high-level sub-activities:

1. City Hall or other administrative office buildings
2. Police Station
3. Fire Department
4. Public Utilities Department
 - a. Administration
 - b. Water Division
 - c. Wastewater Division
 - d. Sanitation Division

Functional Systems: Sub-activities can then be broken-down into functional systems at the next indenture level. Continuing the example above, Item 4.b the Water Department would typically include these types of systems:

1. City Hall or other administrative office buildings
2. Police Station
3. Fire Department
4. Public Utilities Department
 - a. Administration
 - b. Water Division
 - 1) Water pumping
 - 2) Water treatment
 - 3) Water distribution (pipelines)

4. Identifying EE Opportunities

Sub-Systems: Functional systems within the Water Department are comprised of energy consuming sub-systems or assemblies. Carrying forward the example cited above, Item 4.b. (1) Water Department, Water pumping requires the integrated operation of these types of sub-system assemblies:

1. City Hall or other administrative office buildings
2. Police Station
3. Fire Department
4. Public Utilities Department
 - a. Administration
 - b. Water Division
 - 1) Water pumping
 - a) Motor
 - b) Pump
 - c) Control system

Components: Sub-system assemblies may also be defined by type, for final identification of an energy consuming device or component.

1. City Hall or other administrative office buildings
2. Police Station
3. Fire Department
4. Public Utilities Department
 - a. Administration
 - b. Water Division
 - 1) Water pumping
 - a) Motor
 - Vertical shaft well pump motor
 - Horizontal shaft booster pump

Using this example, an energy efficiency measure might be implemented in the Public Utilities Department, Water Division, water pumping system, by installing a high-efficiency vertical shaft well pump motor. Financial assistance is provided through energy efficiency programs that provide cash incentives to offset a portion of the incremental cost of the high-efficiency motor when compared to the cost of a standard-efficiency motor.

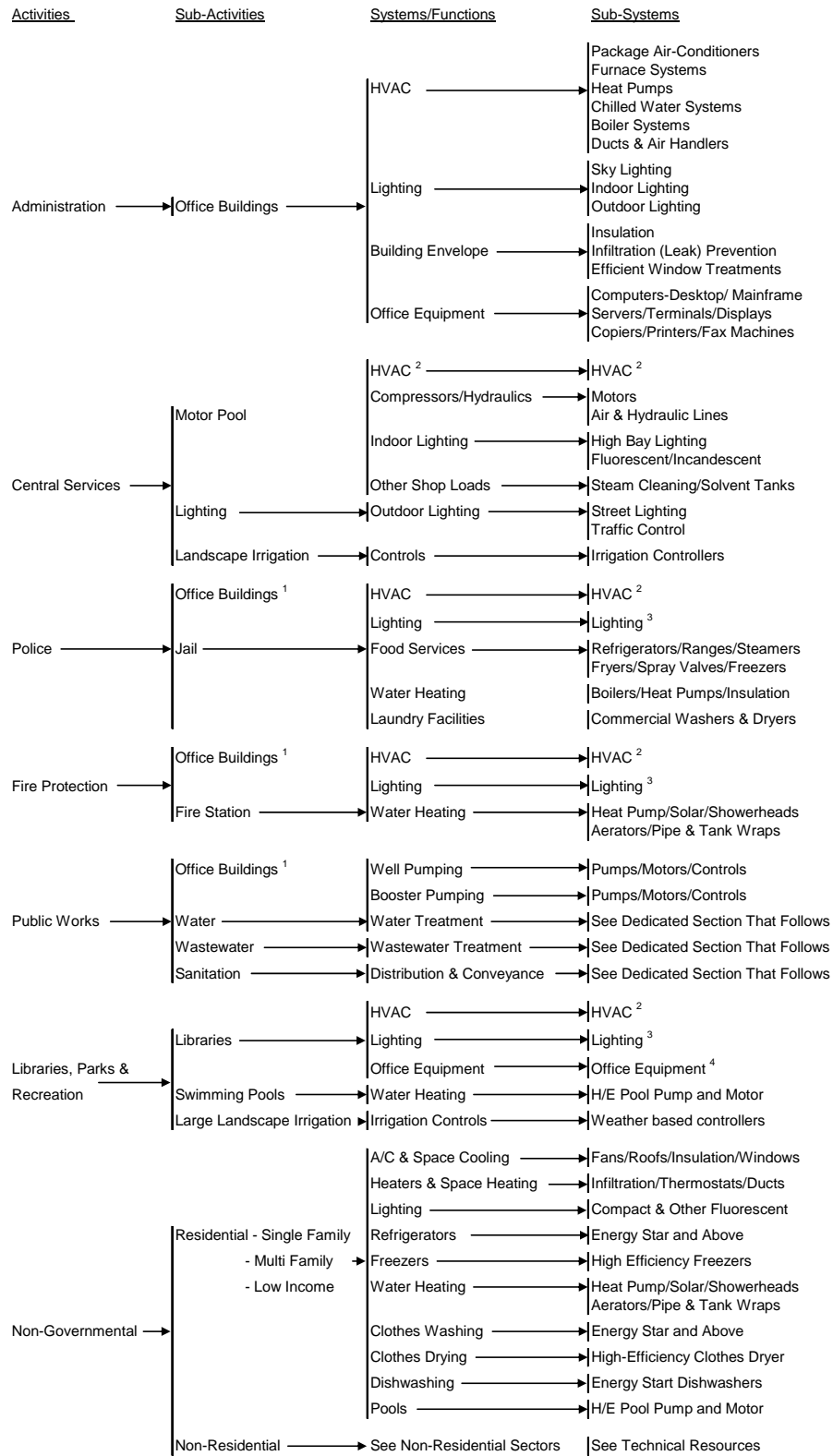
4. Identifying EE Opportunities

The Energy Efficiency Family Tree

Obviously, if a *city* relied on *county* services for its water supply, it need not concern itself with vertical shaft pump motors. Hence, it is important to fully answer the question “Who are you?” before embarking on a coordinated planning effort to reduce energy use. All municipalities will have some of the activities identified in the Family Tree shown below, which presents a structure for identifying areas of energy use and, therefore, areas of potential energy savings. The Family Tree is not meant to be a comprehensive or exhaustive list but rather an example of how planners can structure the way they identify energy-savings opportunities. Planners can use the basic structure as a checklist to identify applicable activities, sub-activities, functional systems and sub-systems, and can add additional branches to the tree structure as appropriate.

4. Identifying EE Opportunities

Local Government Energy Use Family Tree



¹ Office Buildings - Refer to first occurrence of "Office Buildings" for Systems/Functions and Sub-systems
² Heating, Ventilation and Air Conditioning (HVAC) - Refer to first occurrence for Systems/Functions and Sub-systems
³ Lighting - Refer to first occurrence for Systems/Functions and Sub-systems
⁴ Office Equipment - Refer to first occurrence for Systems/Functions and Sub-systems
⁵ See California statewide DSM potential studies, product technical specifications, California DEER, etc.

4. Identifying EE Opportunities

Linking EE Opportunities to Program Incentives

Prescriptive Incentives. Cash incentives are intended to make the motor buyer indifferent (or closer to indifferent) to the higher cost of the high-efficiency motor. Energy efficiency programs report energy savings based on the premise that, but for the cash incentive, the buyer would have opted for the cheaper standard efficiency motor. This type of measure is termed *prescriptive* wherein a fixed dollar amount is paid on a per unit (e.g., per motor) basis, for motors meeting the program's efficiency requirements.

Custom/Performance-Based Incentives. Prescriptive incentives are not well suited to unique, site-specific situations, such as changes to the water system piping configuration, that would save energy but which also have associated incremental costs. For these types of opportunities, financial incentives are provided for energy efficiency measures based upon the amount of energy that will be saved, estimated using engineering calculations and paid based on a pre-established cents per kWh saved. Incentives for these types of measures are often referred to as *custom* or *performance-based* incentives.

New/Replacement vs. Retrofit Situations. Referring back to our example, to determine the level of financial assistance available for procuring the energy efficient motor, a would-be planner would need to know that the vertical shaft motor on a water pump in the Water Division of the Public Utility Department 1) was going to be installed for the first time, 2) had failed and needed to be replaced, or 3) had not failed but was to be replaced specifically to reduce operating costs. Incentive payments are often different, depending on which situation applies.

This is because the energy efficiency programs typically seek to pay incentives for a portion of any additional cost that the efficiency measure causes you to incur (e.g., the more efficient motor costing more to buy). Also, the programs will only pay incentives for efficiency measures, only if they will achieve enough savings over the course of their useful "life" to more than pay for their additional cost (i.e., only if the measures are cost effective). If you were going to buy a replacement motor anyway, the "additional cost" of the high-efficiency version is much less than if you weren't going to replace the motor and you went out and purchased a new, more efficient one. In the latter case, the "additional cost" is the entire cost of the motor. Program incentives would be different for these two situations.

This is an example of the level of specificity required to participate in energy efficiency programs currently provided by the energy utilities. Not at all demanding for Water Department operational staff, perhaps, but very demanding for planners at the City level who are working to maximizing the City's access to energy efficiency funding. Compound this difficulty with the fact few local governments have staff to perform such a function. California's utilities have formed partnerships with local governments across the state in an effort to assist them in taking advantage of energy efficiency programs and helping their constituents to do so.

4. Identifying EE Opportunities

Estimating Energy Savings

Once you know where your organization is using energy, you can begin to identify your potential for energy savings. The CALeep Workbook (pages 55-57) and its Appendix B (“Resources,” pages B-4 through B-9) provide information and data sources to help you to estimate savings. Both of these documents are available on the CALeep website (www.caleep.com). The list below describes the type of questions you need to ask and where you can get help from others in answering them. The California investor-owned utility websites and the Flex Your Power website contain contact information for programs that can provide assistance, the same programs listed earlier in this document.

<u>Question You Need To Answer</u>	<u>Where To Get the Answer/Help</u>
Where is energy being used?	Energy audit/analysis programs
Where are we about to replace equipment?	Internal staff
Where is it cost effective to upgrade working equipment with more efficient equipment?	Energy audit/analysis programs
How much energy can be saved and what will it cost?	Energy audit/analysis programs, or Rebate/Technical Assistance Programs
Where can I get technical, implementation, and financial help to make the improvement?	Rebate and Technical Assistance programs

What About Your Constituents?

But you may also want to address the energy efficiency opportunities of your constituents -- consumers, businesses, etc. The next section of this Technical Addendum provides some basic types of data that can help you estimate savings in the residential and non-residential sectors. Whether you estimate savings potential for a municipality, constituents, or even a single facility, the steps are always the same: Where is energy being used? → Can the efficiency be improved? → Is it cost effective to make the efficiency improvement? → Where can I get assistance in taking action?

Generally, if it is cost effective, there's a program out there to help you make it happen.

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5. Data For Estimating Potential Energy Savings

Residential Sector Data

Planners may find the following data of use in estimating potential energy savings from the residential sector. Also note that residential energy use occurs in single-family housing, multi-family housing and mobile homes, each of which may need to be educated about energy efficiency in different ways.

Where is energy used in the home?*

	<u>Annual Energy</u>	<u>Peak Demand</u>
Lighting	28%	12%
Refrigerator	18%	12%
Other	12%	8%
Laundry	8%	8%
Cooling	7%	45%
Water Heating	6%	3%
Heating	6%	0%
Cooking	5%	3%
Pools/Spa	5%	5%
Dishwashing	3%	2%
Freezer	3%	2%
	100%	100%

Where is the greatest savings potential?*

	<u>Annual Energy</u>	<u>Peak Demand</u>
Lighting	55%	30%
Refrigerator	23%	18%
Other	8%	2%
Laundry (washing)	4%	5%
Cooling	5%	40%
Water Heating		
Heating		
Cooking		
Pools/Spa	5%	5%
Dishwashing		
Freezer		
	100%	100%

Residential Sector Electricity Usage by Building Type within the Major IOU territories:

	<u>GWh</u>
Single-Family	53,892
Multifamily	13,414
Mobile Home	3,289

Includes line losses. Source: CEC 2000. California Energy Demand: 2000-2010

* Data are from the California Statewide Residential Sector Energy Efficiency Study #SW063, KEMA-XENERGY, April 2003. Peak demand" refers to the maximum amount of electricity the electric system needs to provide at any one time to meet customer needs. Electric system planners need to know that they have enough power to meet the peak demand for electricity. Peak demand might occur on the hottest of a series of very hot days in summer, when air conditioning use is highest. In the residential sector, about 45% of that need is driven by cooling (i.e., air conditioning). There are significant opportunities for reducing peak demand savings in cooling but also in lighting.

5. Data For Estimating Potential Energy Savings

Nonresidential Sector Data

In the early 1990s, California energy utilities disaggregated the Commercial Building Sector into fourteen building types, to assist them with conservation and demand-side management planning, as shown below:

- » Large office buildings (>500 kW)
- » Small office buildings (<500 kW)
- » Restaurants
- » Large retail stores
- » Small retail stores
- » Food stores
- » Refrigerated warehouses
- » Non-refrigerated warehouses
- » Elementary and Secondary Schools
- » Colleges and Universities
- » Hospitals
- » Health Clinics
- » Hotels and Motels
- » Miscellaneous commercial buildings

An expanded list of nonresidential building types is compiled below taken from the U.S. Department of Energy*, Building Energy Simulation Modeling** and other sampling. Combined with local government (jurisdiction-specific) data on counts of buildings and building square footage for each building type, power densities provided in watts and kilowatt-hours per square foot provide a basis to approximate how much energy each sector uses.

Energy Savings potential then can be developed based on projected efficiency gains within appropriate end-use categories.

The following pages provide data that may be helpful to planners in estimating commercial energy savings potential.

* Energy Information Administration, Office of Energy Markets and End-Use, U.S. Department of Energy Commercial Buildings Characteristics 1995 DOE/EIA-E-0109

** U.S. Department of Energy Building Energy Simulation Modeling Program DOE-2.1.E

5. Data For Estimating Potential Energy Savings

Commercial Customer Electric Demand and Energy Requirements*

<u>Building Type</u>	<u>Source</u>	<u>kWh/Ft²</u>	<u>Peak Watts/Ft²</u>	<u>Annual Load Factor</u>
Bowling Alley	Sample	23	5.1	52.1%
Elementary School - Small	DOE-2	15.0	8.7	19.7%
College	DOE-2	9.6	3.5	31.9%
Grocery - Small	DOE/EIA	55.6	14.67	46.3%
Grocery - Large	DOE-2	62.7	8.40	84.8%
Health & Fitness	Sample	13.3	4.20	36.4%
Industrial Assembly	DOE-2	23.1	7.90	33.4%
Food Service	DOE/EIA	42.1	12.67	33.3%
Restaurant - Fast Food	DOE-2	90.1	30.20	34.1%
Restaurant - Full Menu	DOE-2	18.6	6.50	32.6%
Health Care	DOE/EIA	27.0	5.89	25.3%
Medical Clinic	Sample	18.9	5.30	41.1%
Lodging - Hotel	DOE-2	9.7	3.80	29.0%
Lodging - Motel	Sample	8.7	2.30	43.2%
Office - Small	DOE-2	23.7	8.20	31.3%
Office - Medium	DOE-2	22.4	8.20	31.3%
Office - Large	DOE-2	18.8	6.60	33.3%
Parking Lot	Eng. Estimate	0.1	0.02	-
Retail Store - Small	DOE-2	17.9	6.20	33.0%
Retail Store - Medium	DOE-2	21.5	6.30	39.0%
Retail Store - Large	DOE-2	23.4	6.30	42.4%
Print Reprographics	Sample	26.5	4.80	62.9%
Public Assembly	DOE/EIA	14.9	5.52	27.4%
Public Order and Safety	DOE/EIA	13.2	5.00	40.4%
Religious Worship	DOE/EIA	4.1	4.20	17.9%
Service Station	Sample	66.0	12.10	62.3%
Warehouse - Unconditioned	DOE/EIA	7.1	2.22	26.5%
Warehouse - Conditioned	DOE-2	11.4	3.50	37.2%
Other	DOE/EIA	22.7	7.33	22.7%
Vacant	DOE/EIA	4.4	2.40	18.9%

* DOE/EIA energy intensities represent broad national median values; samples and DOE-2 modeling reflect regionally mild average values of approximately 1,150 cooling degree days and 1,450 heating degree days (Base: 65 degrees Fahrenheit).

9. Nonresidential Sectors 5. Data For Estimating Potential Energy Savings

Commercial Building Economic Energy Savings Potential by End-Use (*statewide*)*

	Approximate GWh
Interior Lighting	4,800
Refrigeration	2,200
Cooling	1,800
Office Equipment	800
Ventilation	600
Exterior Lighting	400

Typical Energy Efficiency Upgrades in Commercial Buildings (*DOE/EIA*): (Listed in descending order of frequency)

- » **Building Shell:**
 - Roof or Ceiling Insulation
 - Exterior or Interior Shading or Awnings
 - Wall Insulation
 - Storm Windows or Multiple Glazing
 - Tinted, Reflective or Shading Glass
- » **HVAC**
 - HVAC Maintenance
 - Economizer Cycle
 - Variable Air-Volume System
- » **Lighting**
 - High-Efficiency Fluorescent Lighting and Ballasts
 - Specular Reflectors
 - Time Clocks
 - Manual Dimmer Switches
 - Natural Lighting Control Sensors
 - Occupancy Sensors

*California Statewide Commercial Sector Energy Efficiency Potential Study #SW039A – July 2002

5. Data For Estimating Potential Energy Savings

» Other

- Energy Management and Control Systems
- Energy-Efficient Motors
- Energy Audits
- Special Rates and Incentives
- Energy Efficiency Water Heating Equipment
- Electricity Load Control
- Waste-Heat Recovery

Percentage of Annual Energy Use Resulting from Air Conditioning and Lighting, by Building Type*

	Air Conditioning	Lighting
Office Buildings	31%	20%
Retail Stores	28%	43%
Grocery Stores	5%	21%
Restaurants – Full Menu	20%	16%
Restaurant – Fast Food	24%	20%
Warehouses (conditioned)	61%	21%
Health Facilities	34%	N/A

* End-Use Metered Data for Commercial Buildings , SCE April 1997

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6. Two Special Opportunities

In completing the CALeep initiative, we found two energy-efficiency program areas that were particularly fruitful. One was working through California Redevelopment Agencies to provide energy efficiency services to low-income families and small businesses. The other was working to identify energy savings that result from water conservation measures. Each of these opportunities is profiled briefly below.

Using the Redevelopment Agency Channel To Address Low-Income Energy Efficiency

Redevelopment Agencies (RDA) provide the means for local government to establish redevelopment zones where jurisdictions receive all incremental property tax resulting from development. Enabling legislation requires that funding be set aside from this tax revenue to improved substandard housing. The 418 RDAs across California are organized under state law to mitigate regional blight and associated physical, social or economic liabilities. RDAs must use the tax proceeds to revitalize Project Area businesses, enhance protection of the physical environment, improve substandard housing and improve utility services to reduce power outages. Energy efficiency upgrades do all of these things. Additionally, RDAs must reserve 20 percent of the incremental property taxes in a Low and Moderate Income Housing Fund and can be penalized or even have the funds forfeited if the funds are not utilized. RDAs often lack the programmatic mechanisms to perform such low-income programmatic outreach. Energy efficiency programs can be leveraged to achieve RDA redevelopment objectives.

A generic governmental resolution that can be adopted by a governing board of supervisors (county) or city council (city) to facilitate use of the RDA community engagement channel is provided under ATTACHMENT A, and; an agreement to be executed by and between organizations capable of implementing the energy efficiency initiatives is provided in ATTACHMENT B. The terms and conditions would need to be tailored to the specific need, but we provide a developed example of how programs targeting low-income and small commercial customers could be implemented by local government.

* Ibid

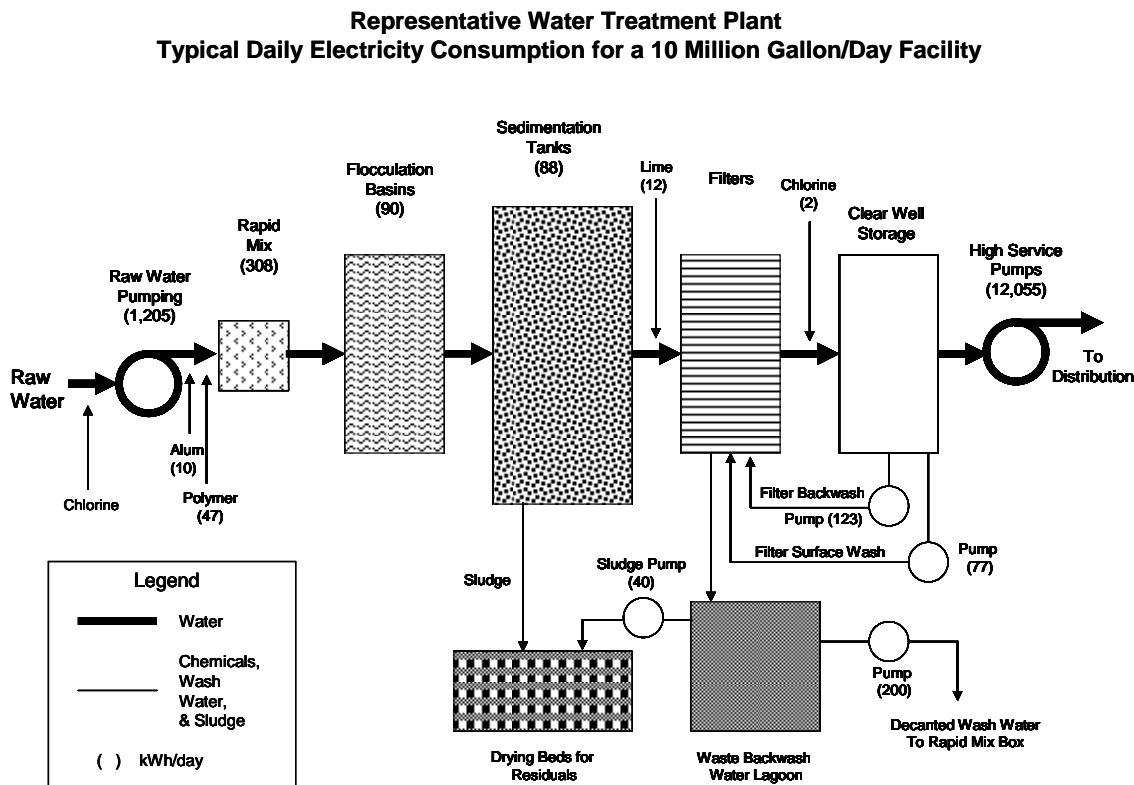
6. Two Special Opportunities

As the CALeep effort drew to a close, the California Energy Commission and other organizations had begun to explore the water-energy nexus more vigorously, because of the potentially significant savings from this previously largely ignored area that falls at the border of water measures and efficiency measures. We discuss the energy savings opportunity in both water treatment and wastewater treatment, below.

Water Treatment

Sub-System Definition. In a typical sequence of operations for surface water treatment, the following steps are followed (see figure below): Raw water is first screened and pre-oxidized, using chlorine or ozone to kill organisms; alum and/or polymeric materials are added to the water; flocculation and sedimentation remove finer particles; a second disinfection step kills remaining organisms with disinfectant residue carried into the distribution system to prevent organism growth; the clear well storage tank allows contact time for disinfection; and treated water is distributed to consumers by high-pressure pumps. Sludge and other impurities removed from the water are concentrated and disposed of. Note the estimated energy use (in kWh) for each step in the process.

Water Treatment Process Energy Requirements



Source: California Energy Commission

6. Two Special Opportunities

Water Treatment Energy Intensity (based on Figure above)

kWh per Million Gallons (MG) of Water Treated

Surface Water Treatment Typical 10 mgd facility		kWh/MG
Public Supply	(Conveyance) Raw Water Pumping	120.5
	(Treatment) Alum	1.0
	Polymer	4.7
	Rapid Mix	30.8
	Flocculation Basins	9.0
	Sedimentation Tanks	8.8
	Lime	1.2
	Filters	0.0
	Chlorine	0.2
	Clear Well Storage	0.0
	Filter Backwash Pump	12.3
	Filter Surface Wash Pump	7.7
	Decanted Washwater to Rapid Mix	20.0
	Sludge Pump	4.0
	Treatment Subtotals	99.7
(Distribution) High Service Pumps	1,205.5	
Total	1,425.7	

There is little variation in water energy intensity between plant sizes (shown in million gallons per day (MGD)), as reflected in the following table:

Unit Electricity Consumption for Surface Water Treatment Plants*

Plant Size	kWh/MG
1 MGD	1,483
5 MGD	1,418
10 MGD	1,406
20 MGD	1,409
50 MGD	1,408
100 MGD	1,407

To isolate the energy requirements for water treatment, the energy needed for raw water pumping and high service pumps to distribution have been removed. The remaining treatment processes total 997 kWh per day for a typical 10 MGD capacity treatment plant

*California Energy Commission, California's Water – Energy Relationship, Final Staff Report November 2005, CEC-500-2005-062-SF

6. Two Special Opportunities

or 99.7 kWh/MG. Actual energy requirements are driven by the site-specific characteristics of incoming raw water and water quality mandates. Industry standard practice, as well as process load metering, often doesn't differentiate raw water pumping, water treatment and distribution pumping loads adequately. The information provided above is drawn from large treatment plant populations (30,000 U.S. Water Treatment Plants) and demonstrates this practice. Operational reporting of water treatment energy intensity is often driven more by the distance and elevation of the treatment plant in relation to water sources and the water distribution system than by the characteristics of raw water due to these vagaries. Typical water treatment processes are estimated at between 100 and 250 kWh/MG, and can be as high as 500 kWh/MG.

Wastewater Treatment

Sub-System Definition. Wastewater is not just sewage. All the water used in the home that goes down the drains or into the sewage collection system is wastewater. This includes water from baths, showers, sinks, dishwashers, washing machines, and toilets. Small businesses and industries often contribute large amounts of wastewater to sewage collection systems; others operate their own wastewater treatment systems. In combined municipal sewage systems, water from storm drains is also added to the municipal wastewater stream. The average American contributes 66 to 192 gallons of wastewater each day. Wastewater is about 99 percent water by weight and is generally referred to as influent as it enters the wastewater treatment facility. "Domestic wastewater" is wastewater that comes primarily from individuals, and does not generally include industrial or agricultural wastewater.

Most treatment plants perform primary treatment (physical removal of floatable and settle-able solids) and secondary treatment (the biological removal of dissolved solids).

Primary treatment involves:

- » Screening- to remove large objects, such as stones or sticks, that could plug lines or block tank inlets.
- » Grit chamber- slows down the flow to allow grit to fall out
- » Sedimentation tank (settling tank or clarifier)- settle-able solids settle out and are pumped away, while oils float to the top and are skimmed off.

Secondary treatment typically utilizes biological treatment processes, in which microorganisms convert non-settle-able solids to settle-able solids. Sedimentation typically follows, allowing the settle-able solids to settle out. Three options include:

6. Two Special Opportunities

- » Activated Sludge- The most common option uses microorganisms in the treatment process to break down organic material with aeration and agitation, and then allows solids to settle out. Bacteria-containing “activated sludge” is continually re-circulated back to the aeration basin to increase the rate of organic decomposition.
- » Trickling Filters- These are beds of coarse media (often stones or plastic) 3-10 ft. deep. Wastewater is sprayed into the air (aeration), and then allowed to trickle through the media. Micro-organisms, attached to and growing on the media, break down organic material in the wastewater. Trickling filters drain at the bottom; the wastewater is collected and then undergoes sedimentation.
- » Lagoons- These are slow, cheap, and relatively inefficient, but can be used for various types of wastewater. They rely on the interaction of sunlight, algae, microorganisms, and oxygen (sometimes aerated).

After primary and secondary treatment, municipal wastewater is usually disinfected using chlorine (or other disinfecting compounds, or occasionally ozone or ultraviolet light). An increasing number of wastewater facilities also employ tertiary treatment, often using advanced treatment methods.

Tertiary treatment may include processes to remove nutrients such as nitrogen and phosphorus, and carbon adsorption to remove chemicals. These processes can be physical, biological, or chemical. Settled solids (sludge) from primary treatment and secondary treatment settling tanks are given further treatment and undergo several options for disposal.

Energy Requirements

Unlike the water treatment and distribution systems, unit volume energy requirements for wastewater treatment plants vary greatly depending upon plant size. As would be expected, unit electricity consumption rises as the degree of treatment and complexity of the process increases. For example, advanced wastewater treatment with nitrification is three times as energy intensive (due to additional pumping requirements) as the relatively simple trickling filter plant. Further complicating the assessment of prototypical wastewater treatment energy intensity (energy use per unit of wastewater) are unique operational environments, discharge limitations, influent characteristics, and permitted effluent limitations as well as variations in plant permitting cycles. Wastewater treatment plant facilities operating in California and cited in studies have demonstrated a range of energy intensities (see table that follows). Based on this range, 2,500 kWh per MG has been adopted as the prototypical wastewater treatment energy intensity.

6. Two Special Opportunities

Estimates of Wastewater Treatment Energy Requirements

	kWh/MG
Inland Empire Utilities Agency ^A	2,971
City of Santa Rosa ^B	2,920
East Bay Municipal Utilities District ^C	2,001
Metropolitan Water District ^D	2655
Methodology for Analysis of Energy Intensity in California's Water Systems ^E	1,911
Energy Down The Drain, The Hidden Costs of California's Water Supply ^F	2,302
Energy Benchmarking Secondary Wastewater Treatment ^G	2,625
^A Average of Five Wastewater Treatment Plants, CALeep Program Analysis May 2005 Program 1241-04, Conducted under the Auspices of the California Public Utilities Commission	
^B Laguna Wastewater Treatment Sonoma County August 2002 Greenhouse Gas Emission Analysis, Page B-7	
^C EBMUD Load Studies Prepared by Navigant Consulting, December 2004	
^D The Metropolitan Water District of Southern California estimates that the wastewater facilities in its service territory consume between 1,470 to 3,840 kWh/MG	
^E Methodology for Analysis of Energy Intensity in California's Water Systems, January 2000, P. 43 Wastewater Treatment Plants with Nitrification Ernest Orlando Lawrence Berkeley Laboratory Principal Investigator: Robert Wilkinson, Ph.D. Ref.: Burton, Franklin L. (Burton Engineering) , 1996 Water and Wastewater Industries Electric Power Research Institute Report CR-106941, p. 2-45	
^F Wastewater Treatment with Nitrification (average 1-100 mgd plant capacities) Energy Down The Drain, p. 26	
^G Energy Benchmarking Secondary Wastewater Treatment and Ultraviolet Disinfection Processes at Various (nine) Municipal Wastewater Treatment Facilities, PG&E February 2002 Electric Use of Total Plant Operations Exec-1 and pg. 5, Table 3 - 1,073 kWh/MG Electric Use of Total Plant Operations Exec-1 and pg. 5, Table 3 - 4,630 kWh/MG	

Energy efficiency upgrades at wastewater treatment plants will depend entirely upon what processes are employed. The following is a summary of common audit recommendations for energy savings at several U.S. wastewater treatment plants:*

- » Install adjustable speed drives on pumps and blowers for variable flow operations
- » Install dissolved oxygen (DO) monitoring and control in aeration tanks
- » Conduct periodic pump tests and repair or replace inefficient pumps
- » Operate emergency generators during peak periods to reduce power demand
- » Install electric load monitoring devices
- » Install capacitors to improve power factor
- » Change or reduce pumping operations
- » Replace oversized motors
- » Change selected operations to off-peak periods

* Metcalf & Eddy, (2003) Wastewater Engineering Treatment and Reuse, Table 15-25

Table of Contents

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Attachments

Attachment A: Generic Resolution for Use of RDA Engagement Channel

County/City Agenda Item Summary Report			Clerk of the Board Use Only	
			Meeting Date ____/____/____	Held Until ____/____/____
			Agenda Item No.	Agenda Item No.
Department: (RDA Governing Body)			<input type="checkbox"/> 4 / 5 Vote Required	
Contact: (RDA Manager)	Phone:	Commission Date:	Deadline for Board Action:	
Agenda Short Title: RDAP Energy Efficiency Program Requested Commission Action: Resolution of the (city/county – council/board/commission) in its capacity as the governing body of the (Redevelopment Agency Name), approving Redevelopment Agency Partnership Energy Efficiency program (RDAP) projects in the (Project Area Name(s)) and authorizing expenditure of up to (RDAP funding commitment - \$____,____) in each Project Area from the respective Project Area tax increment funds				
CURRENT FISCAL YEAR FINANCIAL IMPACT				
<u>EXPENDITURES</u>		<u>ADD'L FUNDS REQUIRING APPROVAL</u>		
Estimated Cost	\$	Contingencies	\$	
Amount Budgeted	\$	(Fund Name:)	
Other Avail Approp	\$	Unanticipated Revenue	\$	
(Explain Below)		(Source:)	
		Other Transfer(s)	\$	
		(Source:)	
Additional Requested: \$		Add'l Funds Requested: \$		
Explanation: (If required)				
More than \$____,____ is available from either housing or non-housing funds for each of Project Area FY06 budgets, as needed.				
Prior Board Action(s):				
(Date): Board/Council adopted the (Project Area Name) Redevelopment Plan				
(Date): Board/Council adopted the (Project Area Name) Redevelopment Plan				
Alternative -- Results of Non-Approval:				
Project Area(s) will not participate in the RDAP Energy Efficiency Program				

Attachment A: Generic Resolution for Use of RDA Engagement Channel

Background:

The (Project Area Name(s)) was/were established in (Date(s)). The Redevelopment Plans for each Project emphasize ecological sensitivity and encourage energy conservation. In (Month) Redevelopment Agency staff attended a California Redevelopment Association (regional chapter meeting/workshop) where they obtained information about the RDAP and energy efficiency project moneys available through the RDAP program provided under the auspices of the California Public Utilities Commission, as part of California's overarching goal of attaining long-term energy assurance for the State of California, attained through cost-effective and environmentally responsible policies, strategies and actions (see attached RDAP flyer).

Through participation in the RDAP program the (RDA name) can implement projects that supplement redevelopment actions and expenditures to rehabilitate, modernize and improve structures located within the Project Area(s). The RDAP program is oriented on the conduct of no-cost comprehensive energy audits of (Project Area Name) properties.

On the (Date) redevelopment staff and the (Project Area Name) oversight/advisory committee received and reviewed the Attached RDAP Facility Audit Reports that identify upgrade projects with an estimated RDAP project funding in the amount of \$____. Redevelopment staff and the (Project Area Name) oversight/advisory committee find the improvements warranted and accept RDAP facility upgrade recommendations contained in the Facility Audit Reports.

The attached resolution will approve RDAP recommended improvements in the (Project Area Name) as described in the Facility Audit Reports. Following adoption of the resolution, RDAP funding will be deposited with the (RDA Name body name) for disbursement with matching redevelopment funds by redevelopment staff, pending verification of project completion by property owners and RDAP inspectors. Redevelopment staff will provide a summary accounting report to RDAP program offices with documentation as specified in the RDAP flyer.

The (Project Are Name(s)) RDAP facility retrofit projects area categorically exempt from the requirements of the California Environmental Quality Act (CEQA) as rehabilitation of existing facilities under the provisions of Section 15301 of the CEQA Guidelines.

Attachments:

- Resolution
- RDAP flyer
- Facility Audit Reports

On File With Clerk:

CLERK OF THE BOARD USE ONLY

Board Action (If Other than "Requested")

Vote:

Attachment A: Generic Resolution for Use of RDA Engagement Channel

Resolution No. _____

Date: _____

Resolution of (RDA governing body), in its capacity as the governing body of the (RDA Name), approving Redevelopment Agency Partnership (RDAP) projects in the (Project Area Name) and authorizing expenditure of up to _____ dollars (\$_____) in the Project Area(s) from the respective Project Area tax increment funds

WHEREAS, the _____ Redevelopment Project was established on _____, ____; and

WHEREAS, the Redevelopment Plans for the _____ Redevelopment Project emphasizes ecological sensitivity and encourage energy conservation; and

WHEREAS, The Redevelopment Agency Partnership administered by _____ (RDAP), under the auspices of the California State Public Utilities Commission (PUC), have proposed facility upgrade projects in the _____ Redevelopment Project Area(s) as part of the RDAP serves to supplement redevelopment agency redevelopment alteration, improvement, modernization, reconstruction and thereby serve the Project Areas' underserved populations; and

WHEREAS, RDAP will provide _____ dollars (\$_____) of project funding for the Project Area that will be matched with local redevelopment funds for the implementation of RDAP projects; and

WHEREAS, the _____ (Advisory or Oversight) Committee has accepted recommended Project Area facility upgrades in the (Project Area Name), copies of which are attached hereto and incorporated by reference herein; and

WHEREAS, the (Advisory or Oversight Committee) has recommended the allocation of tax increment funds from the Project Area(s) to matching RDAP project funds; and

WHEREAS, there are sufficient tax increment funds available in the current ____/____ Budget to provide the tax increment funds for each of the RDAP projects; and

WHEREAS, the RDAP facility upgrade projects will help to eliminate economic blight in the respective Project Areas by helping to encourage energy conservation, thereby making the Project Area more attractive for private investment; and

WHEREAS, the proposed RDAP facility upgrade projects are categorically exempt from the requirements of the California Environmental Quality Act (CEQA) as rehabilitation of existing facilities under the provisions of Section 15301 of the CEQA Guidelines.

NOW, THEREFORE, BE IT RESOLVED that the (RDA governing authority name), in its capacity as the governing body of the (Name of RDA), approves RDAP facility upgrade projects for the (Name Project Area(s)) as described in the attached Facility Audit Reports and authorizes expenditure of up to (\$_____) in tax increment funds in the Project Area as matching funds for the RDAP energy efficiency incentive funds.

BE IT FURTHER RESOLVED that the (governing body) authorizes and directs its Redevelopment Agency Executive Director to receive the RDAP energy efficiency incentive funding and to distribute them, along with the matching redevelopment funds, per the provisions of the RDAP program procedures.

(COMMISSIONERS or COUNCIL MEMBERS):

XXXXX____ XXXXX____ XXXXXX____ XXXXXX____ XXXXXY____

AYES:____ NOES:____ ABSTAIN:____ ABSENT:____

Attachment B: Generic Agreement with Implementing Organization

AGREEMENT BETWEEN _____,

AND *(Name of Redevelopment Agency Governing Body)* FOR

IMPLEMENTATION ENERGY EFFICIENCY FACILITY UPGRADE PROJECTS IN THE *(Name of Redevelopment Project Areas)* AS PART OF THE REDEVELOPMENT AGENCY PARTNERSHIP ENERGY EFFICIENCY PROGRAM (RDAP)

This agreement is made and entered into on _____, _____, by and between the *(Name of Redevelopment Agency Governing Body)*, acting in its authority as the *(Name of the Redevelopment Agency)* (Agency), hereinafter referred to as "*(Board/Council or Commission)*" and *(_____)*, administrator of the RDAP, hereinafter referred to as "RDAP."

WHEREAS, *(Board/Council or Commission)* adopted Redevelopment Plans for the *(Project Area Name(s))* Redevelopment Project(s) on *(Date(s))*; and

WHEREAS, each of the aforesaid Redevelopment Plans encourages energy conservation efforts in the Redevelopment Project Areas (Project Areas); and

WHEREAS, the RDAP has proposed the initiation of energy efficiency facility retrofit projects in the Project Areas through its energy efficiency program that is provided under the auspices of the California Public Utilities Commission (CPUC); and

WHEREAS, facility retrofit projects in their respective Project Areas have been reviewed and accepted by *(project area oversight/advisory committee)*; and

WHEREAS, it is now necessary and desirable to enter into an agreement between the *(Board/Council or Commission)* and the RDAP in order to implement the recommended facility retrofits; and

WHEREAS, the total cost of the facility retrofits is estimated to be \$____,____, with the RDAP providing \$____,____, and the *(board/council or commission)* providing a matching amount from tax increment revenues; and

WHEREAS, sufficient funds are available from the respective Redevelopment Projects; and

WHEREAS, implementation of the RDAP facility retrofit projects will help to eliminate economic blight in the respective Project Areas by increasing the energy efficiency of businesses and residences in those Project Areas.

NOW, THEREFORE, IT IS MUTUALLY AGREED AS FOLLOWS:

In implementing RDAP facility retrofit projects in the Project Area(s),

1. *(Board/Council/ or Commission)* will:

- a. participate in the RDAP energy efficiency program in the Project Area(s) as described in the RDAP flyer and attached Facility Audit Reports;
- b. provide funding for pilot project implementation in the *(Project Area Name(s))* Project Area(s) in an amount not to exceed \$____,____;
- c. provide staff support to coordinate *(oversight/advisory)* committee(s) in the Project Area(s);
- d. with the assistance of Chambers of Commerce, as available, enroll energy audit applicants and convey the applicant information to the RDAP for mapping and scheduling;
- e. provide accounting services to the pilot projects, including disbursing of payments as required.

2. the RDAP and/or its project team members will:

- a. provide \$____,____ in energy efficiency project funding to be expended equally in the two Project Areas;

Attachment B: Generic Agreement with Implementing Organization

- b. provide such additional funds as may be required to fund the Consultant's project team's services to the pilot projects;
- c. develop media pieces in both English and Spanish to inform the residents and businesses in the respective Project Areas about the pilot projects and disseminate those pieces;
- d. map and schedule appointments for energy audits and do follow-up with each applicant to confirm the appointment and provide any instructions about preparing for the energy audits;
- e. conduct the energy audits of businesses and residences in the Project Areas as scheduled, providing information and feedback to the applicants during the audits as required;
- f. provide applicants an explanation about the purpose of the energy efficiency program including sources of program funding and that recommended energy efficiency retrofits will be provided at no cost to the building occupants;
- g. provide a written report of each audit to the respective applicant within thirty (30) days of the audit, recommending potential energy saving measures and providing information about potential assistance programs, and potential energy cost savings from implementation of the recommended measures;
- h. if the applicant agrees, obtain applicant signature on a customer authorization and disclosure forms, generate a work order and leave a copy of the signed customer authorizations and work order for the applicant's records;
- i. facilitate the purchase and installation of identified energy efficiency equipment, coordinate scheduled retrofit activities with qualified retrofit contractors;
- j. monitor contractor progress, performance and verify measure installations;
- k. perform onsite post-verification of all installations, authorize contractor payment pending RDAP and the applicant approval of installations;
- l. prepare a summary report of (Project Area Name) energy audits and retrofit projects scheduled within sixty (60) days of completion of the last audit;

3. Resolution of Disputes

Should any dispute arise between RDAP and the respective Project Area committees as to the particular individual projects to receive services and funding under Sections 2(j) or 2(k) above, the (board/council/ or commission) Executive Director shall resolve such dispute.

4. Compensation and Reimbursement:

- a. Services to the RDAP projects by (board/council or commission) staff or RDAP project team members shall be provided without compensation from the transferred RDAP project funds or matching redevelopment funds. All RDAP project funding and matching redevelopment funds will be used solely to fund the actual cost of acquisition and installation of energy saving devices and measures in the respective Project Areas.
- b. (board/council or commission) shall disburse RDAP and redevelopment funds to reimburse suppliers, contractors, or other third parties for the acquisition and installation of energy saving devices and measures in selected residential or business properties. Funds shall be disbursed by (board/council or commission) only upon receipt of a written approval by RDAP and (board/council or commission) shall provide copies of the bill(s) or invoice(s) covering a cost incurred for specific individual pilot projects.

Attachment B: Generic Agreement with Implementing Organization

5. Adoption of (board/council or commission) Budget:

The annual adoption by (board/council or commission) of the (Redevelopment Agency Name) Redevelopment Agency's budget or any amendments thereto, including the budgeted appropriations therein, shall serve as authorization for (board/council or commission) expenditures under this Agreement.

6. Term of Agreement:

This Agreement shall be effective from the date of its final approval by RDAP and subsequent full execution by (board/council or commission) and RDAP through December 15, 2008 unless extended by mutual written agreement of the parties hereto pursuant to Section 8 below, or terminated pursuant to Section 11 below.

7. Accounting:

(board/council or commission) shall account for funds transferred from RDAP and for all expenditures from the transferred RDAP funds and from tax increment funds from the respective Project Areas.

8. Merger:

This writing is intended both as the final expression of the Agreement between the parties hereto with respect to the included terms and as a complete and exclusive statement of the terms of the Agreement, pursuant to Code of Civil Procedure section 1856. No modification of this Agreement shall be effective unless and until such modification is evidenced by a written document signed by the parties. (board/council or commission) Executive Director is authorized to make minor, non-substantive changes in the Agreement upon consultation with and approval by (board/council or commission) Counsel.

9. Indemnity/Liability:

RDAP agree to accept responsibility for loss or damage to any person or entity, and to defend, indemnify, hold harmless and release the (board/council or commission), its officers, agents, and employees, from actions, claims, damages, disabilities or the cost of litigation that are asserted by any person or entity to the extent arising out of the negligent acts or omissions or willful misconduct in the performance by the RDAP or RDAP's contractors or subcontractors hereunder, whether or not there is concurrent negligence on the part of (board/council or commission), but excluding liability due to the sole active negligence or willful misconduct of (board/council or commission). Notwithstanding any other provision of this Agreement, and in recognition of the relative risks and benefits of this order to both (board/council or commission), the parties agree, to the fullest extent permitted by law, to limit the aggregate liability of RDAP to \$1,000,000. This limitation of liability shall apply to all suits, claims, actions, losses, costs and damages of any nature, including but not limited to legal fees and expenses, arising from or related to this Agreement and without regard to the legal theory under which such liability may be imposed.

10. Insurance:

RDAP shall insure (board/council or commission), and RDAP shall require its contractors for the pilot projects to insure (board/council or commission), using the language in Exhibit "A" as the language for (board/council or commission) insurance requirements, and shall provide evidence of such insurance to (board/council or commission). Exhibit "A" is an integral part of this Agreement.

11. Termination:

Notwithstanding Section 6, this Agreement shall be terminated at such time as all RDAP and redevelopment area funds have been disbursed by (board/council or commission).

Attachment B: Generic Agreement with Implementing Organization

IN WITNESS WHEREOF, the parties hereto have hereunder set their names the day and year above written.

(board/council or commission): (RDAP Name)

By: _____

(Redevelopment Agency Name)

(Board/Council/ or Commission)

By: _____

Title

APPROVED AS TO FORM FOR (BOARD/COUNCIL/ OR COMMISSION):

By: _____

(board/council or commission) Counsel

Exhibit A: Insurance Requirements

INSURANCE REQUIREMENTS

A. Commercial General Liability Insurance

RDAP's contractors for the pilot projects (CONTRACTORS) shall, during the continuance of this Agreement and at no expense to (board/council or commission), maintain commercial general liability insurance, including products liability and completed operations, and contractual liability coverage, in the amount of One Million Dollars (\$1,000,000) per occurrence on account of bodily or personal injuries, including death, or on account of property damage, arising from, or caused, directly or indirectly, by the performance of this Agreement. This insurance shall be a per occurrence policy.

B. Automobile Liability Insurance

CONTRACTORS shall, during the continuance of this Agreement and at no expense to (board/council or commission), maintain business automobile insurance, in the amount of One Million Dollars (\$1,000,000) per occurrence on account of bodily or personal injuries, including death, or on account of property damage arising from or caused, directly or indirectly, by the performance of this Agreement. This insurance shall be a per occurrence policy.

C. Additional Insured Endorsement

Under the public liability, property damage and automobile liability insurance required in Paragraphs A and B above, (board/council or commission), its officers, agents and employees shall be named as additional insureds by endorsement and as to such additional insureds, the insurance shall be primary and the policies shall contain by endorsement a cross liability clause.

D. Workers' Compensation Insurance

CONTRACTORS shall, during the continuance of this Agreement and at no expense to (board/council or commission), maintain workers' compensation insurance, as required by law, for all CONTRACTORS' officers, agents, and employees.

E. Professional Liability Insurance

CONTRACTORS shall, during the term of this Agreement and at no expense to (board/council or commission), maintain professional liability insurance (errors and omissions) in an amount not less than One Million Dollars (\$1,000,000) for any damages which may arise, directly or indirectly, out of any errors and omissions committed by CONTRACTORS in performance of this Agreement.

F. Deductible Self-Insurance Retention

Any deductible or self-insurance retention shall be certified on a certificate of insurance and approved by (board/council or commission). (board/council or commission) may require, at its option, CONTRACTORS to either (1) reduce or eliminate such deductible or self-insurance retention as it applies to (board/council or commission), its officers, agents and employees, or (2) procure a bond guaranteeing payment of losses and all costs associated with investigation, administration and defense of claims and/or lawsuits. The bond shall be in a form acceptable to the (board/council or commission) Attorney and in an amount acceptable to the (board/council or commission) Risk Manager.

G. Certificates

The insurance required by Paragraphs A, B, D and E above shall be evidenced by certificate or certificates submitted to (board/council or commission) which shall be executed by the insurance company or companies involved and which shall state that this insurance may not be terminated without 30 days prior written notice being received by (board/council or commission). The certificate(s) shall be submitted to (board/council or commission) before or at the time RDAP executes this Agreement.

NOTE: This cancellation language deviates from the standard Certificate of Insurance Accord form and should be brought to the attention of the CONTRACTORS and their insurance agencies. The phrases "endeavor to" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives" must be omitted. FAILURE TO COMPLY WITH THIS LANGUAGE WILL CAUSE A DELAY IN THE AGREEMENT OR PAYMENTS.

CONTRACTORS shall file certificates of insurance which shall certify the TOTAL LIMITS of coverage in effect. If such limits are higher than the limits required by the (board/council or commission), the higher limits shall be certified and shall apply to the coverage afforded the (board/council or commission).