

County Sanitation Districts of Los Angeles County Annual Energy Report Fiscal Year 2009/2010



Prepared by:

**Energy Recovery Engineering Section
Solid Waste Management Department**

On The Cover

Top & Middle. Construction of the Calabasas Gas-to-Energy Facility was completed in May 2010. The facility is generating 7 MW of renewable power for sale to the local grid and delivery to Districts Wastewater facilities. The top photo shows the site in July 2009 and the middle photo shows the site after construction was completed.

Bottom. Four new high-speed centrifuges at JWPCP provide \$510,000 in annual energy savings compared to the low-speed centrifuges that were previously operated. The project also received a \$315,000 rebate incentive from SCE in FY 09/10.

TABLE OF CONTENTS

	<u>PAGE</u>
SUMMARY AND HIGHLIGHTS	1
ELECTRICITY PURCHASES	7
ELECTRICITY GENERATION	12
NATURAL GAS	18
VEHICLE FUELS	18
ENERGY EFFICIENCY MANAGEMENT PROGRAM	18
APPENDIX A – DETAILED HISTORICAL DATA, 2003-2010	21
TABLES	
Table 1 Los Angeles County Sanitation Districts Energy Expenditures, 2002-2010	5
Table 2 Summary of Districts Energy Usage and Production, FY 08/09 and FY 09/10	6
Table 3 Electricity Purchase Prices, FY 08/09 and FY 09/10	11
Table 4 Summary of Districts Power Generation Facilities, 2010	14
Table 5 Summary of Solid Waste Electricity Sales, FY 08/09 and FY 09/10	17
FIGURES	
Figure 1 Los Angeles County Sanitation Districts Energy Expenditures, 2002-2010	4
Figure 2 Total Districts Electricity Usage, 2003-2010	7
Figure 3 Wastewater Treatment Average Power Consumption, FY 09/10	8
Figure 4 Electrical Usage for All Wastewater Treatment Facilities FY 09/10	9
Figure 5 System Wide Wastewater Treatment Plant Power Consumption, 2003-2010	10
Figure 6 Sources of LACSD Electricity, FY 09/10	12
Figure 7 Districts Energy Production and Use, 2010	15
Figure 8 Districts Net Revenues from Electricity Sales	16
Figure 9 Energy Efficiency Management Program Annual Savings	19
Figure 10 Cumulative Reduced and Avoided Power Usage Since Initiation of Energy Efficiency Management Program	20

County Sanitation Districts of Los Angeles County

Annual Energy Report

Fiscal Year 2009-2010

SUMMARY AND HIGHLIGHTS

This report provides highlights of the Districts energy management program, including an annual summary of Districts energy expenditures and revenues from electrical sales, and projections of expenditures for the next fiscal year. Figure 1 and Table 1 present historical energy expenditures for the last eight years and Table 2 presents a summary of expenditures, income, usage, and rates for the last two years. Detailed historical price and usage data are included in Appendix A. Key conclusions and observations for major energy program areas are presented below.

Expenditures and Prices

- Total energy expenditures for FY 09/10 were \$22.2 million, a 23.9% decrease from the previous year.
- Total annual electricity usage was down 3.6 % from the previous fiscal year. Purchased power dropped from 14.1 MW to 12.2 MW while the Districts generation for on-site use increased from 22.4 MW to 23.1 MW.
- The average price of purchased electricity dropped by 15.6% while electricity purchases (in kW-hr) decreased by 20.4% compared to last fiscal year. The lower price was largely due to lower Direct Access (DA) energy charges and the termination of the trailing energy crisis charges collected by Southern California Edison (SCE) in late 2009. A portion of the purchased electricity was displaced by Districts' power generation from the Palos Verdes Gas-To-Energy Facility Phase I and the Puente Hills Gas-To-Energy Facility Phase II. Overall Districts-wide electricity consumption, including purchased electricity and Districts generation, was reduced by 3.6% or 1.3 MW.
- The cost of DA power (including SCE charges) was 2.0 cents/kWh less than bundled SCE power. This is primarily due to the long-awaited drop in utility DA surcharges, which has brought DA power costs below SCE power costs for the first time in the past six years. This lower cost is expected to continue in the future.
- The 24.4% reduction in natural gas expenditures was attributed to a 22.2% lower average gas price and a 4.3% decrease in usage.
- Districts-wide diesel expenditures declined 26.3% from the previous year. Solid Waste diesel expenditures dropped by 38.6% because of reduced activity at landfills and an 8.5% reduction in fuel prices.
- Energy expenditures for FY 10/11 are expected to be \$21,656,400, a 2.3% decrease from FY 09/10, mainly due to lower priced DA long-term power contracts and lower natural gas

prices.

Energy Production

- In FY 09/10, Districts' electricity production facilities produced \$16.3 million worth of power used on-site and generated \$28 million of net income from outside electricity sales.
- The Districts' average power generation from the Solid Waste Facilities was 66 MW, an increase of 4.2 MW over the previous year. The majority of the increase (3.6 MW) was from the Puente Hills Gas-To-Energy Facility Phase I (PERG), where FY 08/09 power output had been reduced due to a turbine overhaul outage. Average generation for all Solid Waste facilities is summarized in Table 5. Total power sold to SCE was 59.2 MW and the remaining 6.8 MW was delivered to the Districts' wastewater treatment plants for on-site use.
- Construction of the Calabasas Gas-to-Energy Facility was completed in May 2010. The facility is generating 7 MW net power. This is 2 MW less than earlier projections due to reduced landfill gas flow resulting from lower daily landfill tonnage.
- The power output from the JWPCP Total Energy Facility remains limited to 18 MW due to a steam turbine generator failure in 2008.

Energy Efficiency Management Program

- Energy efficiency accounted for \$2.7 million in savings in FY 09/10, and cumulative reductions in electrical load totaled 2.0 MW.
- The major energy efficiency project brought online was the JWPCP Centrifuge Replacement Project, where the installation of four high-speed centrifuges is saving \$355,000 per year in energy costs compared to the low-speed centrifuges. Further operational optimization of the centrifuges has increased the energy savings by another \$155,000 per year. The project also received a \$315,000 rebate incentive from SCE.
- Correction of billing errors resulted in \$220,000 in savings during FY 09/10. Newly optimized power rates lead to an additional \$65,000 in annual savings.

Outlook

- The cost of Direct Access power continues to decrease due to a favorable long-term power purchase made in November 2010 of 5 MW for 3 years at 4.3 cents/kWh and 3 MW for 1 year at 3.5 cents/kWh.
- Savings from the Energy Efficiency Program will continue to increase as new technologies are implemented. Projects investigating potential aeration savings at San Jose Creek and Pomona WRPs have been initiated.
- The approval of the market for tradable Renewable Energy Credits (RECs) by the California Public Utilities Commission (CPUC) is still pending. It is uncertain at this time when or whether the renewable attributes of JWPCP Total Energy Facility and the Puente Hills Engine Facility can be brought to market to provide additional revenue.
- Diesel expenditures are forecast to increase by 64%, based on a projected 32% increase in cost from \$2.34 to \$3.05 per gallon and a return to FY 08/09 usage levels.

Figure 1.
Los Angeles County Sanitation Districts' Energy Expenditures 2002-2010

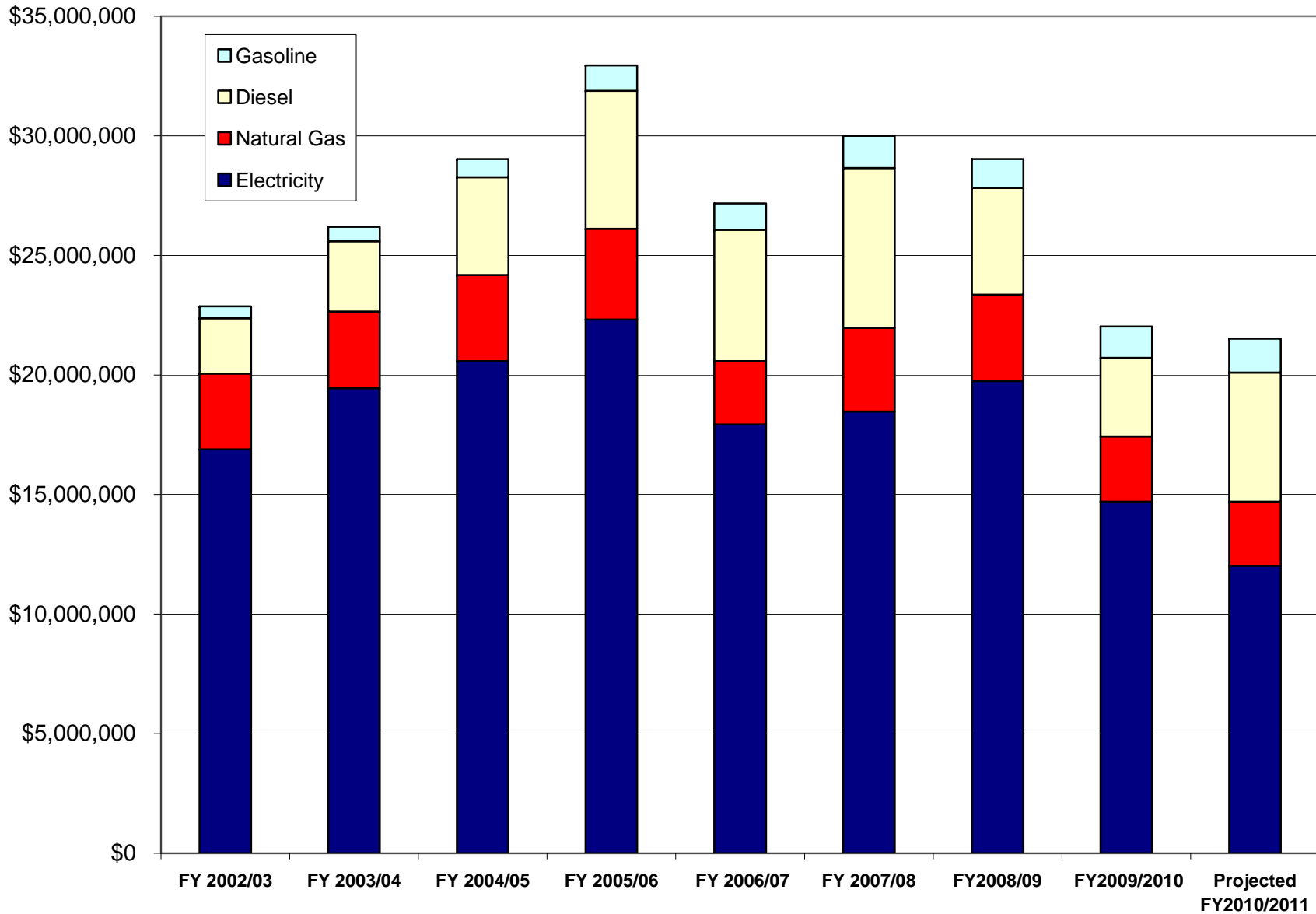


Table 1. Los Angeles County Sanitation Districts Energy Expenditures, 2002-2010

	FY 2002/03	FY 2003/04	FY 2004/05	FY 2005/06	FY 2006/07	FY 2007/08	FY2008/09	FY2009/2010	Projected FY2010/2011
Electricity (Acct. 41256)									
JWPCP	\$1,227,480	\$1,096,141	\$946,955	\$1,360,003	\$839,897	\$1,003,173	\$2,860,700	\$1,697,826	
JAO & SJCWRP	\$4,657,373	\$4,753,974	\$4,946,017	\$6,029,242	\$4,401,172	\$3,503,982	\$2,388,894	\$1,466,409	
Other Wastewater (1)	\$7,307,807	\$9,376,372	\$10,227,489	\$11,074,327	\$9,156,261	\$10,286,346	\$10,664,811	\$8,301,738	
Solid Waste (2)	\$2,209,633	\$2,322,968	\$2,262,696	\$2,266,140	\$2,072,980	\$2,507,903	\$2,472,570	\$1,836,484	
Misc. (Mostly Pumping Plants)	\$1,483,019	\$1,896,090	\$2,194,085	\$1,591,091	\$1,481,547	\$1,738,765	\$1,888,153	\$1,725,645	
Rebates for Energy Efficiency Measures					-\$23,800	-\$567,930	-\$530,790	-\$330,494	
TOTAL:	\$16,885,312	\$19,445,545	\$20,577,242	\$22,320,803	\$17,928,057	\$18,472,239	\$19,744,338	\$14,697,608	\$12,025,300
Natural Gas (Acct. 41255)									
Commerce	\$489,017	\$460,827	\$716,987	\$694,875	\$215,380	\$303,711	\$111,859	\$92,670	
JAO	\$144,420	\$178,130	\$215,569	\$116,883	\$110,160	\$153,719	\$118,017	\$78,448	
JWPCP	\$1,384,719	\$1,751,863	\$1,790,492	\$2,440,023	\$1,756,981	\$2,251,567	\$2,713,316	\$2,126,245	
Palos Verdes	\$1,009,723	\$729,914	\$770,078	\$450,146	\$470,629	\$572,403	\$560,511	\$346,463	
Other	\$147,447	\$81,978	\$117,900	\$87,877	\$99,619	\$215,610	\$108,379	\$87,475	
TOTAL:	\$3,175,326	\$3,202,712	\$3,611,026	\$3,789,804	\$2,652,769	\$3,497,010	\$3,612,082	\$2,731,301	\$2,673,100
Diesel (Acct. 41305)									
Solid Waste (2)	\$2,098,386	\$2,650,086	\$3,723,010	\$5,362,915	\$5,087,311	\$6,214,571	\$4,061,019	\$2,998,543	
Wastewater (3)	\$96,535	\$123,534	\$133,526	\$114,894	\$86,425	\$107,382	\$99,052	\$68,441	
Misc. (Mostly Other Equip. Pools)	\$119,623	\$166,154	\$219,084	\$299,928	\$317,869	\$364,023	\$305,000	\$221,746	
TOTAL:	\$2,314,544	\$2,939,774	\$4,075,620	\$5,777,737	\$5,491,605	\$6,685,976	\$4,465,071	\$3,288,730	\$5,401,100
Gasoline (Acct. 41304)									
TOTAL:	\$492,701	\$605,476	\$768,805	\$1,058,892	\$1,105,165	\$1,345,856	\$1,207,122	\$1,314,001	\$1,420,800
LNG and CNG									
MRF						\$229,896	\$201,883	\$217,642	
Carson						\$3,095	\$8,489	\$14,426	
Other								\$12,349	
Royalty Payments						-\$35,900	-\$69,561	-\$109,709	
Fed Excise Tax Credit							-\$57,100		
TOTAL:				\$14,470	\$34,662	\$197,091	\$83,711	\$134,707	\$136,100
TOTAL ENERGY USAGE COSTS:	\$22,867,883	\$26,193,507	\$29,032,693	\$32,961,706	\$27,212,258	\$30,198,173	\$29,112,324	\$22,166,347	\$21,656,400

(1) Pomona, Whittier Narrows, Los Coyotes, Long Beach, Saugus, Valencia, Palmdale, Lancaster, La Canada, Compton, San Gabriel.

(2) Puente Hills, Spadra, Scholl Canyon, Calabasas, Mission Canyon, South Gate, Commerce, Palos Verdes.

Note: Diesel Expenditures for Solid Waste includes the Joint Refuse Equipment Pool and the L.A. County Equipment Pool.

(3) JWPCP, SJCWRP, plus "Other Wastewater".

Table 2. Summary of Districts Energy Usage and Production, FY 08/09 and 09/10

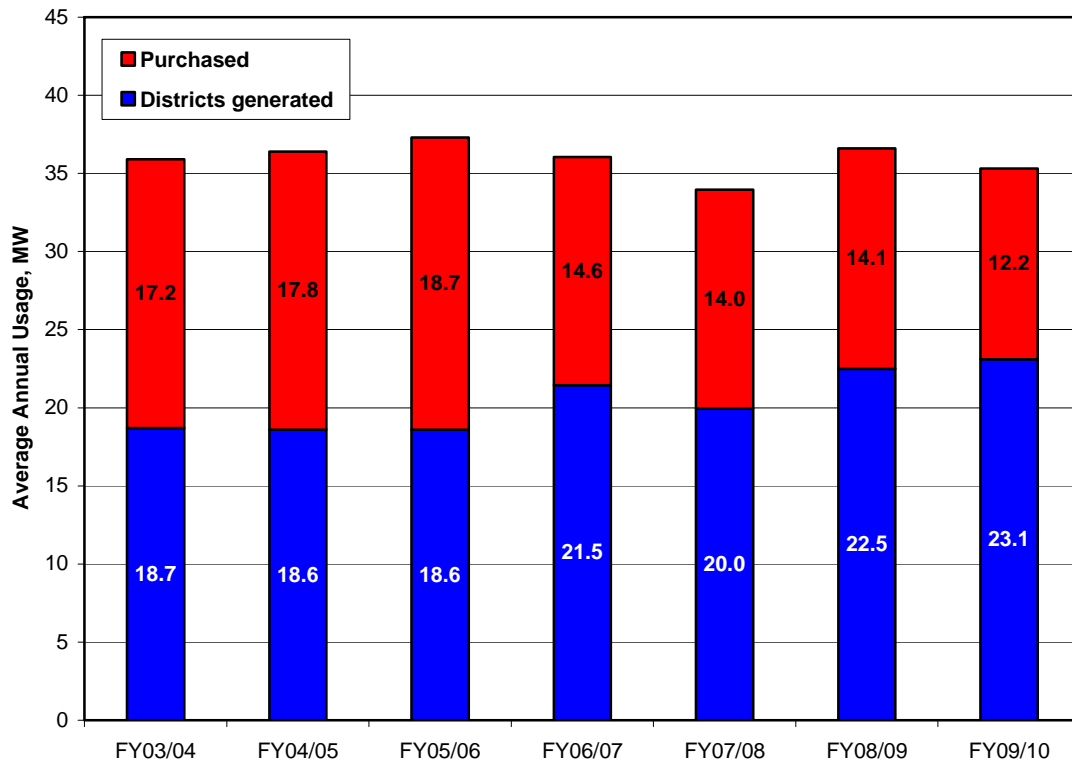
	FY08/09	FY09/10	Change
Purchased Electricity			
Expenditures (1)	\$19,744,338	\$14,697,608	-25.6%
Total Usage, kW-hr	123,516,000	106,880,479	-13.5%
Average Usage, MW	14.1	12.2	-13.5%
Rate, \$/kW-hr	\$0.135	\$0.114	-15.6%
Natural Gas Purchases			
Expenditures (2)	\$3,612,082	\$2,731,301	-24.4%
Total Usage, MMBtu	467,106	447,008	-4.3%
Rate, \$/MMBtu	\$7.73	\$6.02	-22.2%
Diesel Purchases			
Expenditures	\$4,465,071	\$3,288,730	-26.3%
Total Usage, gallons	1,770,848	1,425,956	-19.5%
Rate, \$/gallon	\$2.52	\$2.31	-8.5%
Gasoline Purchases			
Expenditures	\$1,207,122	\$1,314,001	8.9%
Total Usage, gallons	424,012	439,889	3.7%
Rate, \$/gallon	\$2.85	\$2.99	4.9%
LNG & CNG			
Expenditures	\$83,711	\$134,707	60.9%
Total Energy Expenditures	\$29,112,324	\$22,166,347	-23.9%
Outside Electricity Sales			
Revenues, net of operating costs	\$19,920,181	\$28,073,433	40.9%
Total Sales, kW-hr	491,793,811	518,689,597	5.5%
Average Sales, MW	56.1	59.2	5.5%
Net Income, \$/kW-hr	\$0.041	\$0.054	33.6%
Internal Sales			
Gross Retail Sales (PH Engines)	\$4,346,324	\$3,767,477	-13.3%
Gross Wholesale Sales (PV)	\$347,890	\$326,191	-6.2%
SCE costs on wholesale sales ³	\$618,386	\$855,214	38.3%
Total \$	\$5,312,599	\$4,948,882	-6.8%
kWh	49,576,122	59,140,047	19.3%
MW	5.7	6.8	19.3%
\$/kW-hr	\$0.107	\$0.084	-21.9%
Electricity Generated and Used on Site			
Value	\$19,840,320	\$16,329,831	-17.7%
Total Generation, kW-hr	146,965,331	143,244,129	-2.5%
Average Generation, MW	16.8	16.4	-2.7%

(1) These number includes miscellaneous cost and rebates related to purchased electricity, which do not reflect in the rate of electricity.

(2) These numbers include new construction cost and miscellaneous charges by the So. Cal Gas Company which do not reflect in the rate of natural gas.

(3) Wholesale power delivered from PV to other Districts facilities incurs SCE transmission, distribution, and public purpose charges.

Figure 2. Total Districts Electricity Usage, 2003-2010



ELECTRICITY PURCHASES

Figure 2 presents average system-wide electricity usage for the last seven years. Average Districts-generated electricity was 23.1 MW, up 0.6 MW from the previous year. Significant changes in Districts' generation include:

- Output from Palos Verdes Gas-to-Energy Facility (PVGTE) was delivered to other Districts facilities for a fiscal year average of 2.2 MW. This is a 1-MW increase over the previous year due to a total of 12 months of delivery in FY 09/10 versus only 6 months in FY 08/09. The SCE contract for PVGTE expired in December 2008.
- Total on-site generation decreased 0.4 MW over the last fiscal year due to the shutdowns of the Valencia IC Engine (February 2009) and the Palmdale Fuel Cell (June 2009).

Average total annual electricity usage for FY 09/10 was 35.3 MW, down from 36.6 MW the previous year. This is primarily due to the fact that wastewater flows have decreased by 16 mgd (3.3%) from the previous year, contributing to a 0.8 MW (2.6%) decrease in power consumption at the treatment plants. Another significant contribution to decreased electrical usage was the installation of four new high-speed centrifuges at JWPCP, which are calculated to save 350 kW of power.

Total consumption for each treatment plant (excluding La Canada) is shown in Figure 3. JWPCP represents about half of the electrical usage at an average annual load of 17.2 MW, while the other facilities average 0.5 to 3.6 MW.

**Figure 3. Wastewater Treatment Facilities
Average Power Consumption, FY 09/10**

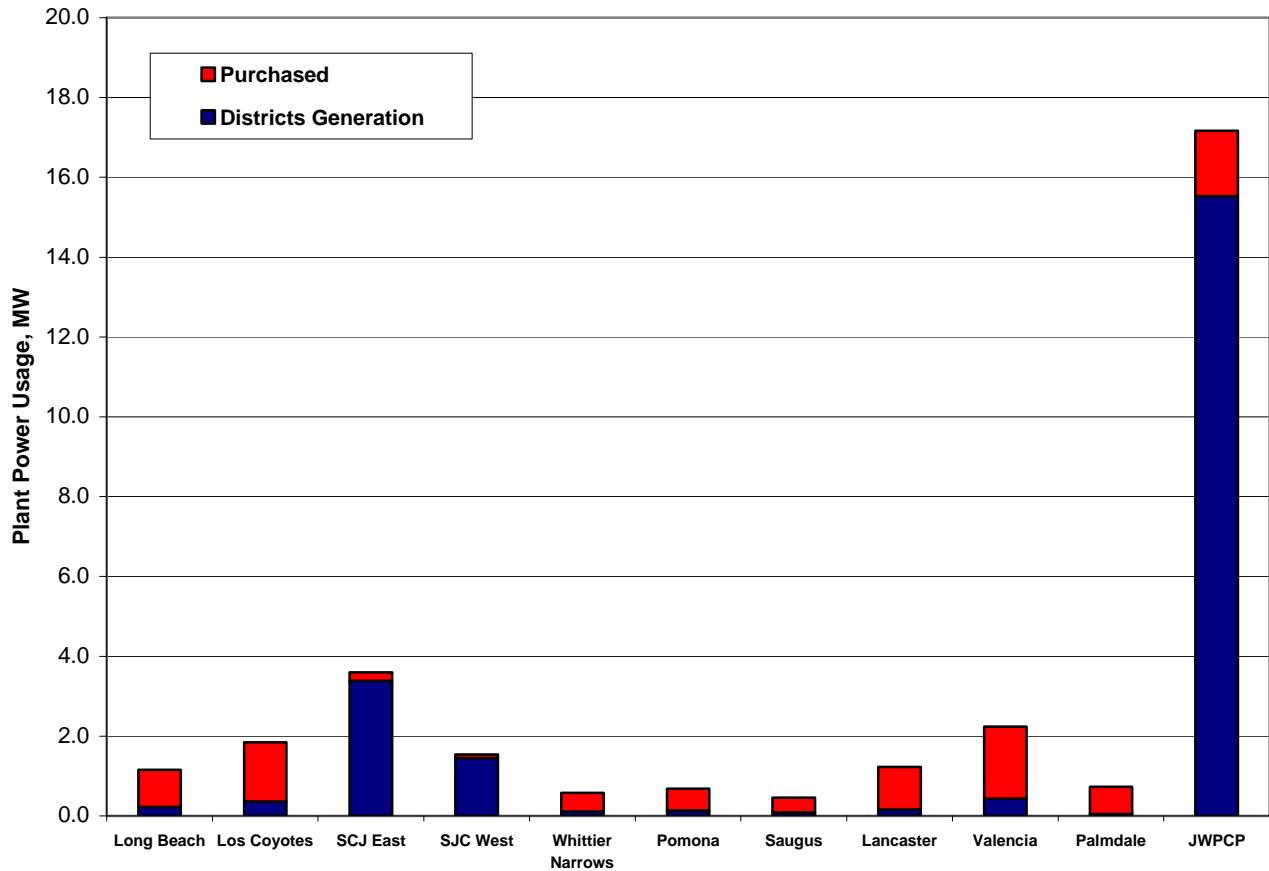


Figure 4 presents electrical usage for each facility in terms of kWh per million gallon of wastewater treated (kWh/mg). Electrical usage rates range from a low of 1,500 kWh/mg at San Jose Creek WRP West and JWPCP to a high of over 3,600 kWh/mg at Valencia WRP. The variations are largely due to different levels of treatment at the plants and economies of scale.

A notable change in energy usage this year occurred at Pomona WRP, where the electrical usage rate decreased by 20% from the previous year. The major factor that led to this decrease was efforts to cut back on air usage in the secondary aeration tanks. As a result, the plant was able to go from using two 600 hp process air compressors to just one compressor. By the second half of the fiscal

year, power consumption at Pomona WRP had dropped to an average of 1,700 kWh/mg, a decrease of 730 kWh/mg, or 30%, from the previous fiscal year. This represents an annual savings of \$255,000.

Valencia WRP had an increase in the electricity usage rate for the third consecutive year. Since FY 06/07, the energy usage rate has increased by 360 kWh/mg, or 11%. Investigation into this increase continues.

In addition, the electrical usage rates at Los Coyotes WRP and Saugus WRP increased by 11% and 10% respectively. Wastewater flows at Los Coyotes WRP decreased by 11% during the year (much due to sewer construction activities), while power consumption only decreased by 1%. At Saugus WRP, flows decreased by 17%, while power consumption decreased by only 8%. The fact that energy consumption at these facilities dropped by a lower percentage than wastewater flows represents a trend that has been seen over the past several years, namely that energy consumption at the treatment plants does not tend to decrease proportional to flow. This represents a potential opportunity to increase the efficiency of the treatment plants by making operational changes to better handle the lower flows, or to replace equipment that can turn down more efficiently at lower flow.

Figure 4. Electrical Usage Rate for All Wastewater Treatment Facilities, FY 09/10

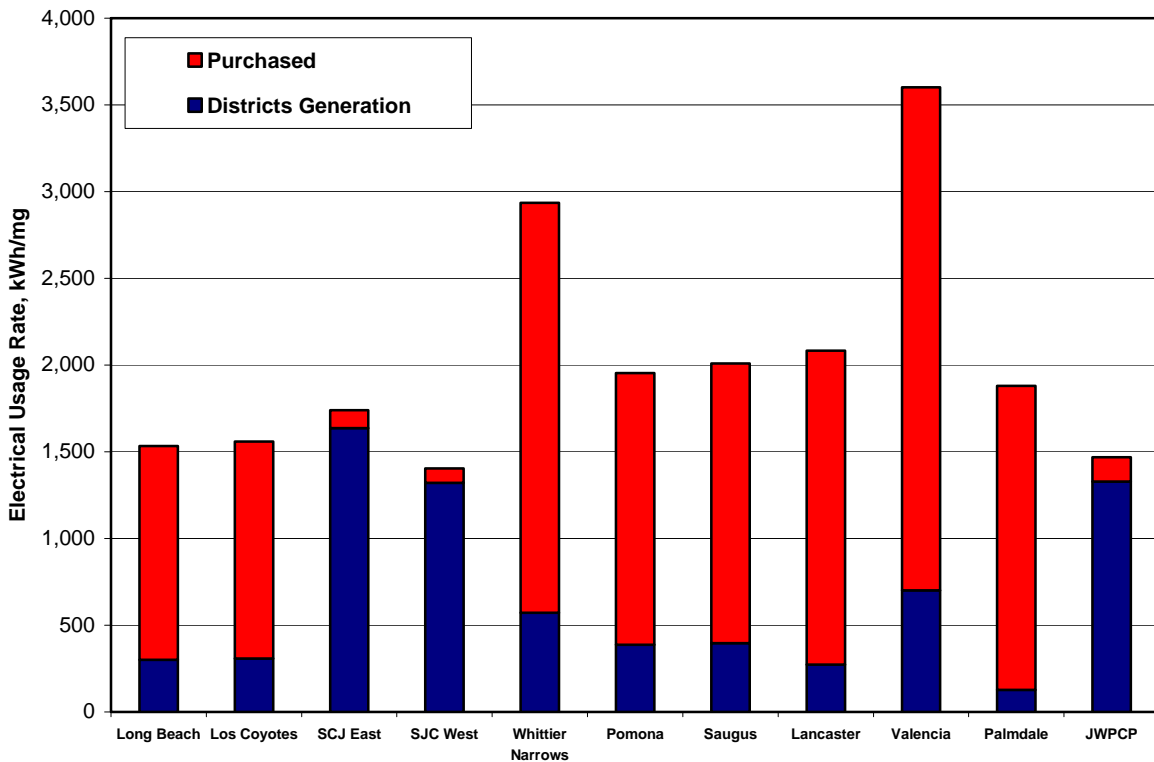
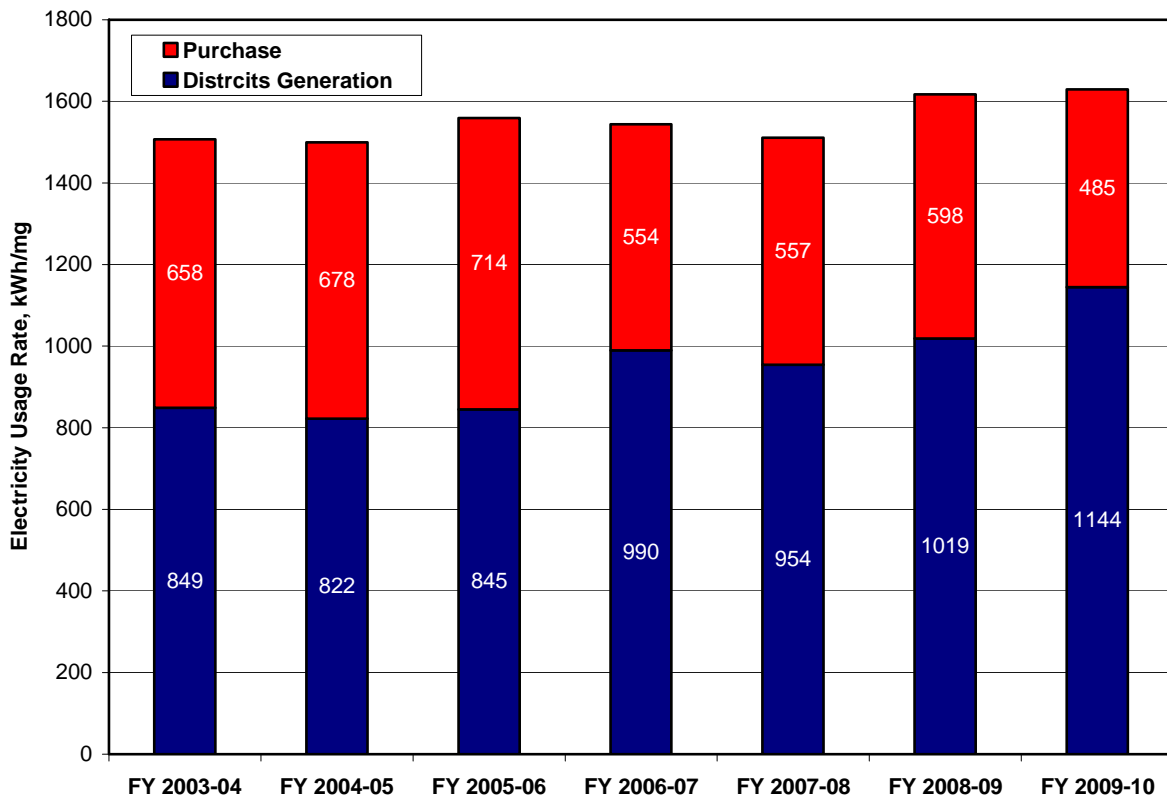


Figure 5 presents the system wide wastewater treatment electricity usage rate in kWh/mg for the last seven years. The electricity usage rate increased slightly from approximately 1,617 to 1,629 kWh/mg. This increase is primarily attributed to the fact that system-wide wastewater flows dropped by 3.3%, while the drop in total treatment plant power consumption was 2.6%. This is in line with what occurred at the Los Coyotes and Saugus WRPs, where it was seen that energy consumption at the treatment plants does not tend to decrease proportional to flow.

FY 09/10 represents the fifth consecutive year that wastewater flows have decreased. Over this time period there has been a 15% drop in flows, while energy consumption has dropped by just 7%. It should be noted that wastewater flows are not the only factor leading to changes in energy consumption during this time period.

Figure 5. System Wide Wastewater Treatment Power Consumption 2003-2010



In the next few years there will be a number of factors that will both increase and decrease energy usage and purchases. Implementation of additional energy conservation measures, such as secondary treatment improvements at Whittier Narrows WRP, will drive usage down. Implementation of advanced treatment such as full tertiary at Palmdale WRP and Lancaster WRP and UV disinfection at various WRPs will drive usage up. Installation of the new steam turbine generator at JWPCP will decrease the amount of purchased electricity.

Table 3 shows average electrical rates for Direct Access, bundled SCE accounts, and Districts

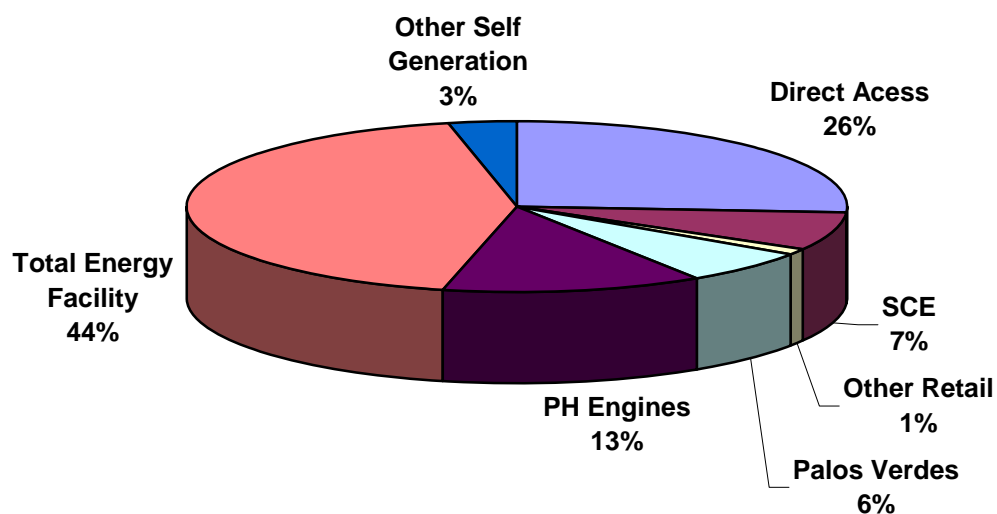
provided power for FY 08/09 and 09/10, and Figure 6 shows the sources of electricity used at Districts facilities. Districts generation provided 66% of the electricity used Districts-wide. DA purchases through Sempra Energy Solutions comprised 78% of total purchases and 26% of total usage. Generation charges for DA power dropped by 15%, while total costs for DA electricity including SCE charges were 19% lower.

Table 3. Details of Electricity Prices

	FY08/09	FY09/10	Change
Electricity Charges, \$/kW-hr			
Direct Access, Sempra energy charges	0.0772	0.0657	-15.0%
Direct Access, Sempra plus SCE charges	0.1353	0.1101	-18.6%
SCE Bundled Accounts	0.1314	0.1296	-1.3%
Districts provided power	0.1070	0.0840	-21.5%
Electricity Usage, kW-hr			
Direct Access APS	97,052,054	81,145,299	-16.4%
SCE Bundled Accounts	23,196,248	22,271,139	-4.0%
Districts provided power	49,576,122	59,140,047	19.3%
Total Usage, kW-hr*	169,824,424	162,556,485	-4.3%
Weighted Average, \$/kWh	0.126	0.103	-18.4%

* Total does not include purchases from municipal utilities (primarily Los Angeles), which represent 3% of purchases.

Figure 6. Sources of LACSD Electricity, FY 09/10



ELECTRICITY GENERATION

Table 4 presents a summary of Districts power generation facilities, and Figure 7 presents an illustration of Districts electricity generation, sale, and use.

Figure 8 and Table 5 show net income from electrical sales for the three Gas-to-Energy Facilities and the Commerce Refuse-to-Energy Facility. Details on all Districts power generation facilities are presented below.

Palos Verdes Gas-to-Energy Facility Phase I. The power sales contract with SCE expired on December 21, 2008. Since that time the power has been scheduled by Sempra and delivered to Districts wastewater facilities. Installation and successful commissioning of the new Zink Ultra Low Emissions Flare at Palos Verdes in summer 2011 will allow this facility to be shut down.

Palos Verdes Gas-to-Energy Facility Phase II was cancelled. The project would have included eight 250 kW microturbines and a 300 kW fuel cell. The project was delayed for three years by community requests for more detailed CEQA analysis and the SCAQMD permitting moratorium. An SCAQMD permit was granted in 2010; however, the proposed project was no longer cost effective. The Districts will continue to track emerging technologies, such as the FlexEnergy low methane microturbine, in a search for a cost-effective energy project at Palos Verdes.

Puente Hills Gas-to-Energy Facility Phase I (PERG). Production increased by about 9% from the last fiscal year. Due to a turbine overhaul outage in January 2009 and reduced landfill gas flow, the power production from PERG for FY 08/09 was reduced by 10%. The increase in FY 09/10 brought the generation close to the FY 07/08 level. Power is being sold to SCE under a contract that runs through 2016, with pricing set at 6.3 cents/kWh through 2012.

Puente Hills Gas-to-Energy Facility Phase II continues to operate with two engines for an average availability of 88%. Power is supplied to San Jose Creek WRPs at a price 10% below the price of retail electricity. Overall the plant ran well.

Spadra Gas-to-Energy Facility. Electricity production decreased by 5% at Spadra due to declining landfill gas production. Power is sold to SCE at the same price as PERG. Cash flow is expected to be negative in the next 1-3 years. In addition, it is expected that the facility will not be able to meet its contract capacity during the summer capacity demonstration in that same time frame, therefore requiring re-payment to SCE for past capacity payments of approximately \$1,000,000. The feasibility of selling conditioned landfill gas to Cal Poly Pomona for a future campus power plant is being evaluated.

Calabasas Gas-to-Energy Facility. Construction of the Calabasas Gas-to-Energy Facility was completed on May 31, 2010 and startup activities commenced on June 1. The Facility was commissioned and began the sale of exported power to the California Independent System Operator electrical grid on July 12, 2010. The facility is exporting 7 MW, 2 MW less than the earlier projection due to limited landfill gas flow resulting from lower daily landfill tonnage. Following commissioning, plant availability of greater than 95% was achieved in late 2010.

The JWPCP Total Energy Facility continued to operate reliably in FY 09/10. Plant output remains limited to 18 MW due to replacement of the steam system under the Power Generation Facility - Steam Cycle Modifications construction contract that began in August 2009. Replacement is expected to be completed in late 2011.

Commerce Refuse-to-Energy Facility. Production increased by 9.8% over the previous year due to increased plant availability and significantly better performance while on-line. Power is being sold to SCE at 9 cents/kWh plus approximately 2.3 cents/kWh average capacity and bonus payments.

Table 4. Summary of Districts Power Generation Facilities, 2010

Summary of LACSD power generation, January 2011						
Facility	Power Generation Technology	Fuel Type	Rated Net Power Production, MW			Comments
			Sold to Grid	Directed to Districts Facilities	Used On-Site	
Joint Water Pollution Control Plant	Combined Cycle Gas Turbine-Cogen	Digester Gas			18	Plant capacity derated from 22 MW to 18 MW due to generator failure in 2008. Replacement expected in late 2011.
Lancaster Water Reclamation Plant	Microturbine w/ Waste Heat Recovery	Digester Gas				Unit down since May 2010 but not yet decommissioned
Calabasas Landfill	Gas Turbine Generator	Landfill Gas	0.8	6.3	0.2	Output limited by landfill gas flow.
Puente Hills Landfill	Steam Boiler/Turbine	Landfill Gas	46			Power sold to SCE under long term contract.
Puente Hills Landfill	Gas Turbine Generator	Landfill Gas			1	
Spadra Landfill	Steam Boiler/Turbine	Landfill Gas	5			Power sold to SCE under long term contract. Output has been reduced due to declining gas flows.
Palos Verdes Landfill	Steam Boiler/Turbine	Landfill Gas		2.1		
Puente Hills Landfill	IC Engine Facility	Landfill Gas			5.4	Facility derated from 8 MW to 6 MW due to gas supply limitations.
Southeast Resource Recovery Facility	Mass Burn / Steam Turbine	Refuse	30			Operated by City of Long Beach
Commerce Refuse-To-Energy Facility	Mass Burn / Steam Turbine	Refuse	10			Power sold to SCE under long term contract.
Total Generating Capacity			91.8	8.4	24.6	
Total power generated		124.8				
Power purchased-Direct Access		0.0				
Power purchased-SCE		1.0				
Total Districts facilities usage		34.0				
Notes and assumptions:						
IC Engine Plant operating with 2 engines at 5.4 MW						
PV steam plant may shut down on commissioning of new flare, summer 2011						
System load of 34 MW is actual for FY 09/10						

Figure 7. Districts Energy Production and Usage, January 2011.

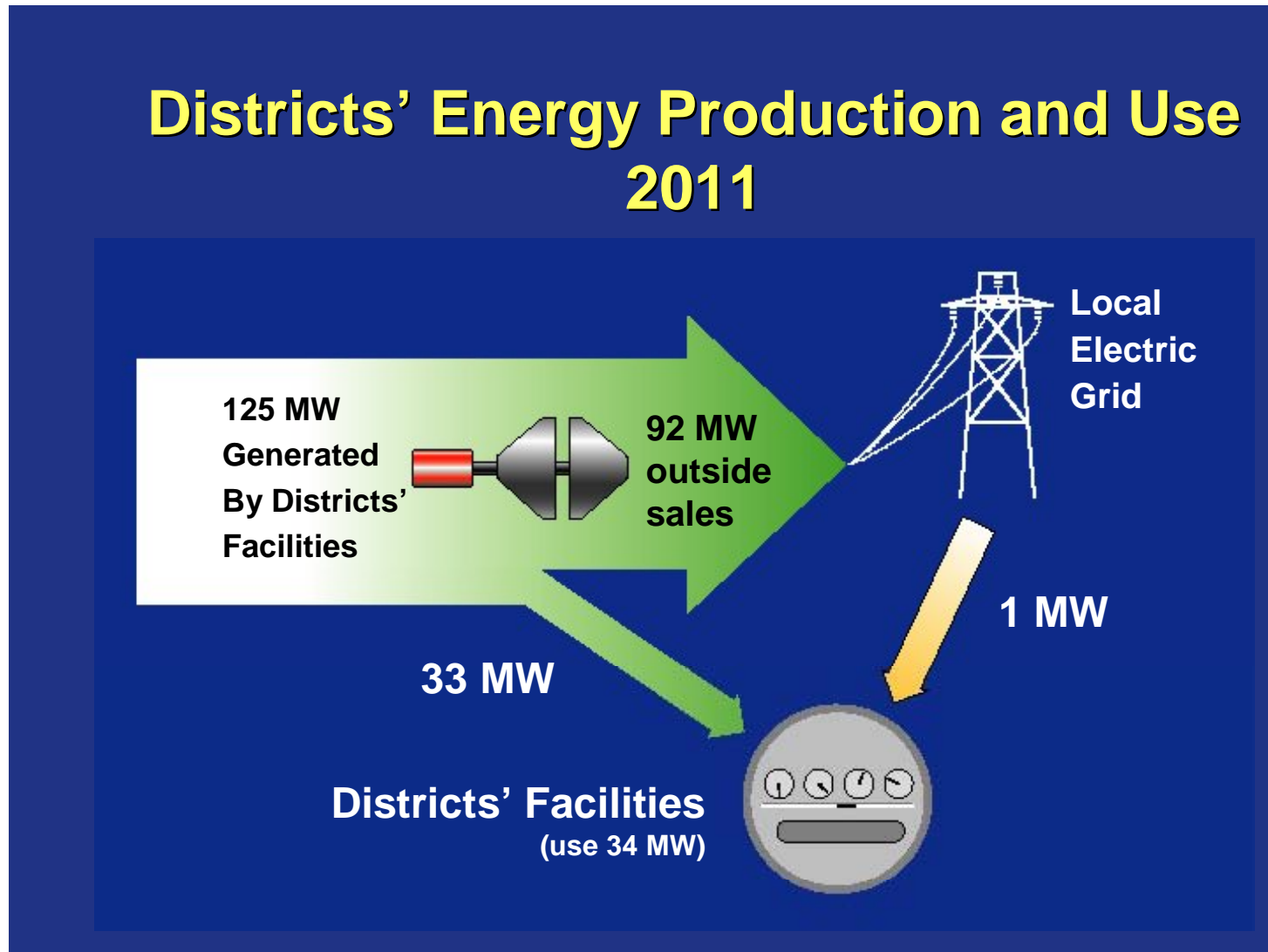


Figure 8. Districts Net Revenues from Electricity Sales

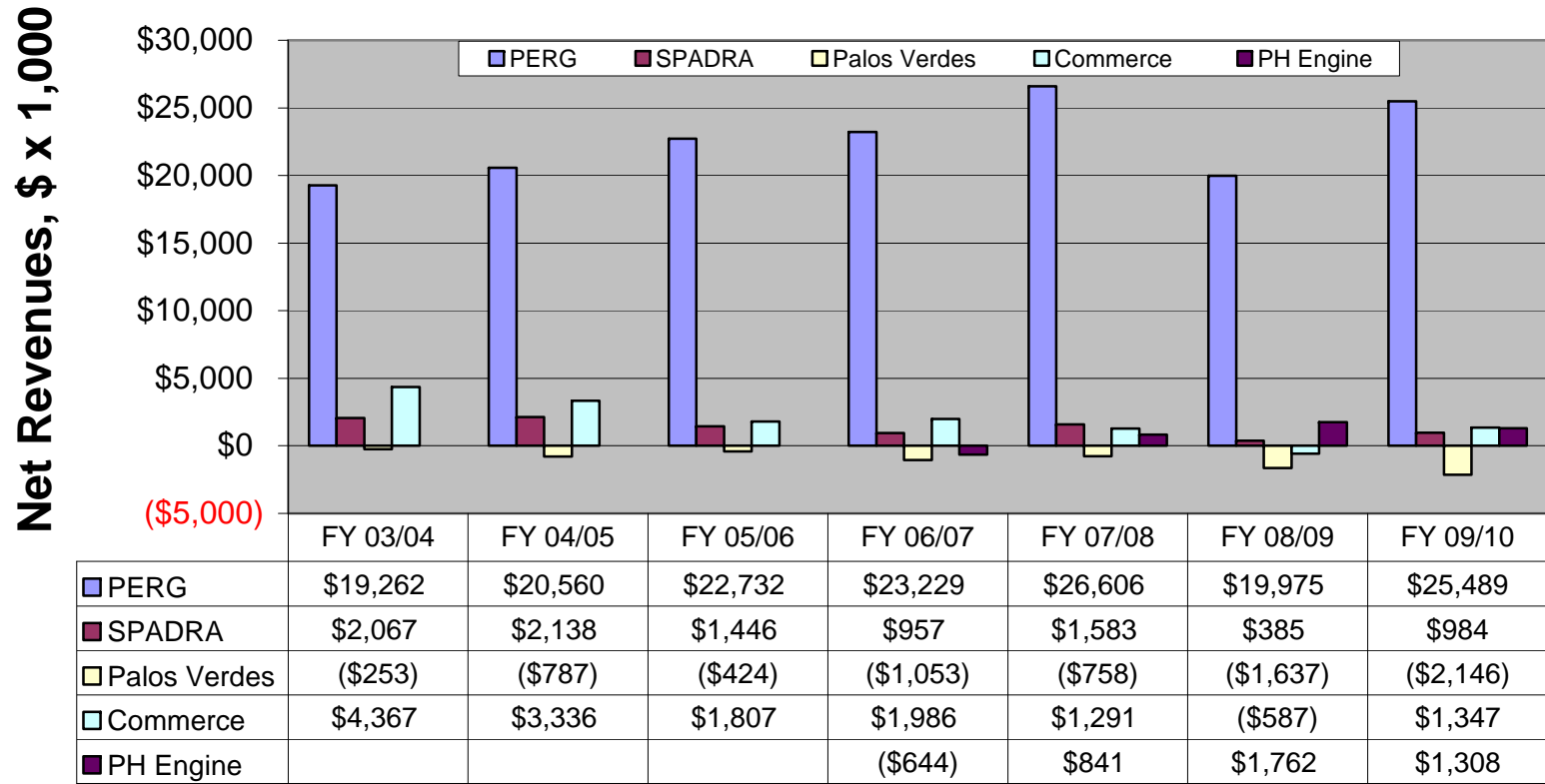


Table 5. Summary of Solid Waste Electricity Sales, FY 08/09 and FY 09/10

	FY08/09	FY09/10	Change
Outside Electricity Sold, kW-hr			
Puente Hills Boiler	360,101,908	391,650,786	8.8%
Puente Hills Turbine	4,888,000	6,193,600	26.7%
Spadra	46,621,412	44,364,680	-4.8%
Palos Verdes	10,497,491	0	-100.0%
Commerce	69,685,000	76,480,531	9.8%
Total	491,793,811	518,689,597	5.5%
Internal Electricity Sold, kW-hr			
Puente Hills Phase II	38,991,110	39,862,412	2.2%
Palos Verdes	10,585,012	19,277,635	82.1%
Total	49,576,122	59,140,047	19.3%
Average Generation, MW net			
Puente Hills Boiler	41.1	44.7	8.8%
Puente Hills Turbine	0.6	0.7	26.7%
Puente Hills Phase II	4.5	4.6	2.2%
Spadra	5.3	5.1	-4.8%
Palos Verdes	2.4	2.2	-8.6%
Commerce	8.0	8.7	9.8%
Total	61.8	66.0	6.7%
Net Operating Income, \$			
Puente Hills Boiler	\$19,974,701	\$25,488,522	27.6%
Puente Hills Turbine	\$680,304	\$253,410	-62.8%
Puente Hills Phase II (1)	\$1,762,154	\$1,308,311	-25.8%
Spadra	\$384,865	\$984,002	155.7%
Palos Verdes	(\$1,637,476)	(\$2,146,053)	31.1%
Commerce (2)	(\$562,318)	\$1,347,499	-339.6%
Total	\$20,602,230	\$27,235,691	32.2%
Operating Costs, \$			
Puente Hills Boiler	\$12,056,510	\$8,911,237	-26.1%
Puente Hills Turbine	\$174,917	\$154,901	-11.4%
Puente Hills Phase II (3)	\$2,687,844	\$2,478,353	-7.8%
Spadra	\$3,822,440	\$3,159,031	-17.4%
Palos Verdes	\$3,254,445	\$2,468,982	-24.1%
Commerce	\$14,166,996	\$13,916,421	-1.8%
Total	\$36,163,152	\$31,088,925	-14.0%
Operating Costs, \$/kW-hr			
Puente Hills Boiler	\$0.033	\$0.023	-32.0%
Puente Hills Turbine	\$0.036	\$0.025	-30.1%
Puente Hills Phase II	\$0.069	\$0.061	-11.4%
Spadra	\$0.082	\$0.071	-13.2%
Palos Verdes	\$0.154	\$0.128	-17.0%
Commerce	\$0.203	\$0.182	-10.5%
Weighted Average	\$0.067	\$0.054	-19.5%

(1) Puente Hills Phase II does not include capital recovery of approximately \$1.8 million per year.

(2) Commerce operating revenue does not include bond payments and O&M reduction payments.

(3) Revised FY 08-09 operating costs to remove a capital expenditure.

NATURAL GAS

Natural gas expenditures for FY 09/10 were \$2.7 million, a 24.4% decrease from the previous year. District-wide usage dropped 4.3% over the previous year and the gas price decreased by 22.2%. The gas consumption by the Total Energy Facility at JWPCP continued to be at a higher level due to the demolition of the steam turbine generator. The loss of some of the power output from the steam plant was made up by combusting more natural gas in the gas turbines. It is estimated that the JWPCP natural gas usage will remain at the same level until late 2011 when the replacement steam turbine will be online.

Natural gas costs and usage are projected to remain unchanged for FY 10/11.

VEHICLE FUELS

Expenditures for diesel for FY 09/10 were 26.3% lower than the previous fiscal year. The decrease was attributed to both reduction in usage and reduced fuel costs. Consumption at the landfills was down 18% due to declined incoming refuse and operational changes. The projection for FY 10/11 assumes a Districts-wide usage back to FY 08/09 level and a 32% increase in price.

Gasoline expenditures for FY 09/10 were 8.9% higher than FY 08/09 because of higher fuel costs and an increase in consumption. The Districts-wide usage was 3.7% higher than the previous year. The projection assumes flat usage and an 8% increase in price for FY 10/11.

LNG and CNG expenditures increased by 60.9% over the previous year. It is predicted that the LNG and CNG usage will increase slightly in FY 10/11.

ENERGY EFFICIENCY MANAGEMENT PROGRAM

The Energy Efficiency Management Program (EEMP) documented \$2.9 million in savings for FY 09/10 (see Figure 9 and Table A-2). Of this, \$1.0 million is new savings that came about from new activities during the year and \$1.9 in carryover savings that continued from activities in previous years (mainly energy savings from capital improvement projects and operational optimization that are ongoing). The savings consist of the following:

- Energy savings associated with capital improvement projects that have been implemented by the Districts since 2006 provided \$1.7 million in savings during the year. The energy savings from capital improvement projects was \$200,000 more than the last fiscal year.
- Southern California Edison energy efficiency rebate incentives yielded \$330,000 during the year. The majority of the incentive money was from the JWPCP High-Speed Centrifuge project.
- Energy savings from operational optimization were \$450,000 for the year, up from \$190,000 from the previous year. These savings included operational modifications to the newly installed high-speed centrifuges that reduced power usage by an additional 1.4 million kWh per year, reduction in aeration at Pomona WRP that saved 2.1 million kWh per year, and an aggressive usage reduction effort at DART that reduced its electrical consumption by more

than half through modifications to lighting and ventilation, saving 480,000 kWh per year.

- Correction of billing errors and optimization of electrical tariff rates resulted in \$390,000 in savings for the year. A review of pumping accounts to optimize rates and close unused accounts resulted in \$50,000 in new savings during the year. Correction of a billing error at White Point Pumping Plant resulted in a reimbursement of \$145,000.
- Participation in the demand response program at San Jose Creek WRP resulted in \$35,000 in revenue.

Districts energy efficiency efforts since the start of the EEMP in 2006 have resulted in reduced and avoided power usage of 2.1 MW (see Figure 10). This is a 700 kW improvement over the previous year.

Figure 9: Energy Efficiency Management Program Annual Savings

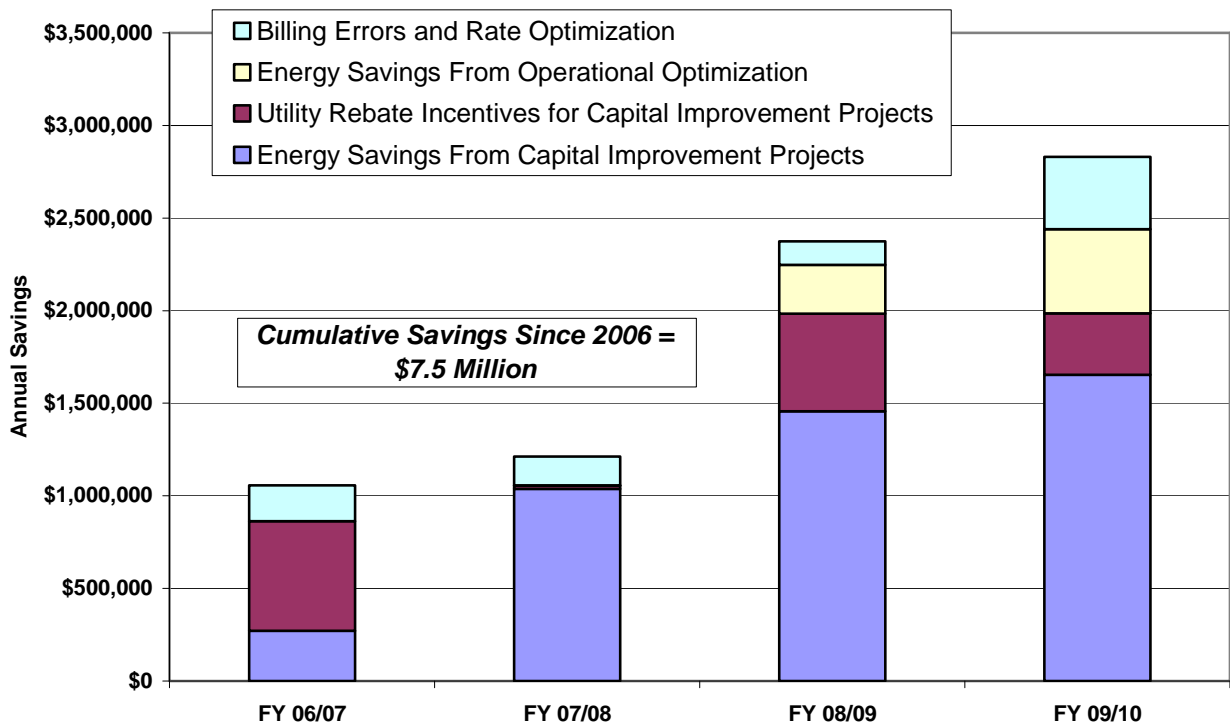
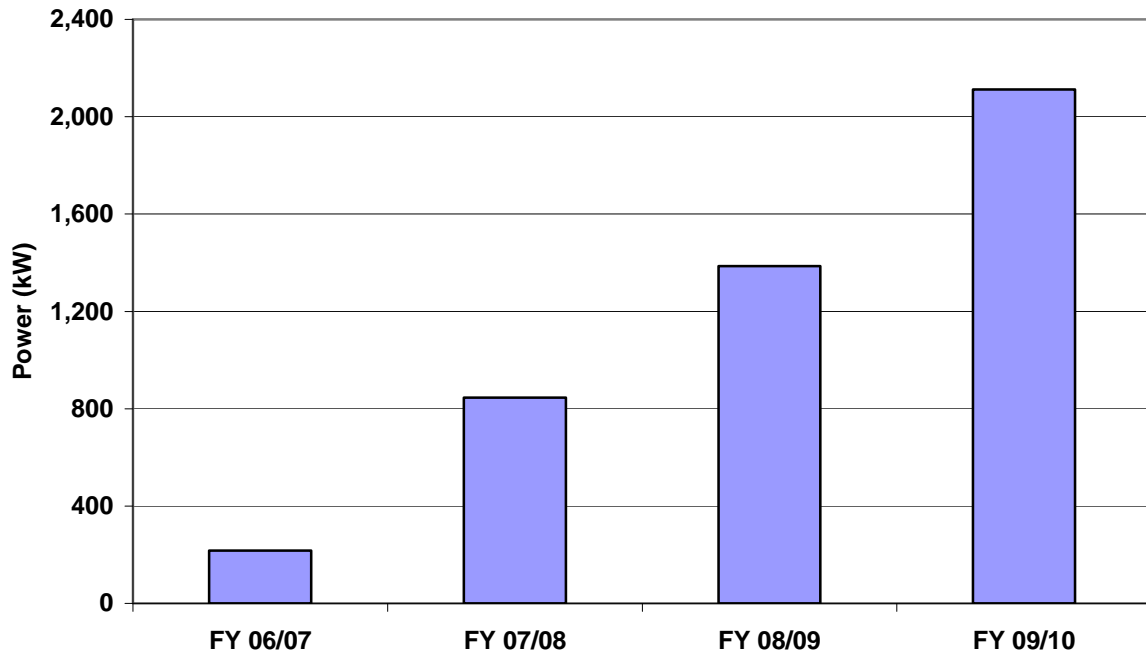


Figure 10: Cumulative Reduced and Avoided Power Usage Since Initiation of Energy Efficiency Management Program



Appendix A. Detailed Historical Data, 2003-2010

Table A-1. Detailed Historical Energy Usage and Cost Data

Figure A-1. Electricity Rates

Figure A-2. Natural Gas Rates

Figure A-3. Natural Gas Usage

Figure A-4. Vehicle Fuel Rates

Figure A-5. Vehicle Fuel Usage

Table A-2. Energy Efficiency Management Program Project Savings

Table A-1. Detailed Historical Energy Data, 2003-2010

	FY03/04	FY04/05	FY05/06	FY06/07	FY07/08	FY08/09
Average Generation, MW						
Puente Hills	44.4	42.9	46.5	48.6	46.9	41.7
Puente Hills Phase II				3.0	3.2	4.5
Spadra	8	7.8	7	6.5	5.6	5.3
Palos Verdes	4.5	3.8	3.9	3.3	3.2	2.4
Commerce	8.1	8.4	8.1	7.8	7.8	8.0
Total	65	62.9	65.5	69.2	66.7	61.9
Net Operating Income, \$						
Puente Hills	\$19,262,000	\$20,560,000	\$22,731,903	\$23,780,385	\$25,346,489	20,655,005
Puente Hills Phase II				\$1,256,818	\$1,490,976	1,215,001
Spadra	\$2,067,000	\$2,138,000	\$1,445,653	\$1,516,476	\$1,072,840	384,865
Palos Verdes	(\$253,000)	(\$787,000)	(\$424,237)	(\$1,107,144)	(\$1,042,570)	(1,637,476)
Commerce	\$4,366,817	\$3,336,072	\$1,807,112	\$1,985,916	\$1,290,682	(587,933)
Total	\$25,442,817	\$25,247,072	\$25,560,431	\$27,432,451	\$28,158,417	20,029,462
Operating Costs, \$/kW-hr						
Puente Hills	\$0.021	\$0.024	\$0.023	\$0.021	\$0.022	\$0.034
Puente Hills Phase II				\$0.079	\$0.094	\$0.112
Spadra	\$0.044	\$0.042	\$0.055	\$0.057	\$0.067	\$0.082
Palos Verdes	\$0.084	\$0.099	\$0.078	\$0.104	\$0.114	\$0.154
Commerce	\$0.125	\$0.136	\$0.165	\$0.174	\$0.183	\$0.203
Weighted Average	\$0.041	\$0.046	\$0.047	\$0.048	\$0.052	\$0.070
Electricity Rate, \$/kWh						
DA, power only	\$0.067	\$0.070	\$0.080	\$0.080	\$0.085	\$0.077
SCE charges for DA power	\$0.050	\$0.050	\$0.052	\$0.062	\$0.059	\$0.058
DA plus SCE	\$0.116	\$0.120	\$0.133	\$0.143	\$0.143	\$0.135
SCE	\$0.112	\$0.113	\$0.121	\$0.136	\$0.128	\$0.131
Weighted average	\$0.115	\$0.119	\$0.131	\$0.140	\$0.140	\$0.135
Electricity Usage, MW						
DA	14.5	15.3	16.1	11.6	11.3	11.1
SCE	2.8	2.5	2.6	2.5	2.6	2.6
Total	17.2	17.9	18.7	14.1	14.0	13.7
Districts Generation						
Value, \$ (Note 1)	\$18,979,992	\$19,400,074	\$21,298,248	\$26,435,904	\$24,608,416	\$2,653,096
Average Generation, MW	18.7	18.6	18.6	21.5	20.0	22.5
Natural Gas						
Expenditures	\$3,202,712	\$3,611,026	\$3,789,804	\$2,652,769	\$3,497,010	\$3,612,082
Usage, MMBtu	516,566	531,815	402,148	327,354	409,112	467,106
Rate, \$/MMBtu	6.2	\$6.79	\$9.00	\$7.85	\$8.42	\$7.73
Diesel						
Expenditures	\$2,939,774	\$4,074,620	\$5,777,737	\$5,491,605	\$6,685,976	\$4,465,071
Usage, gallons	2,356,332	2,378,918	2,476,379	2,299,030	2,213,009	\$1,770,848
Rate, \$/gallon	\$1.25	\$1.71	\$2.33	\$2.39	\$3.02	\$2.52
Gasoline						
Expenditures	\$605,476	\$768,805	\$1,058,892	\$1,105,165	\$1,345,856	\$1,207,122
Usage, gallons	291,531	298,603	339,205	325,723	360,007	\$424,012
Rate, \$/gallon	\$2.08	\$2.57	\$3.12	\$3.39	\$3.74	\$2.85

Figure A-1. Electricity Rates, 2003-2010

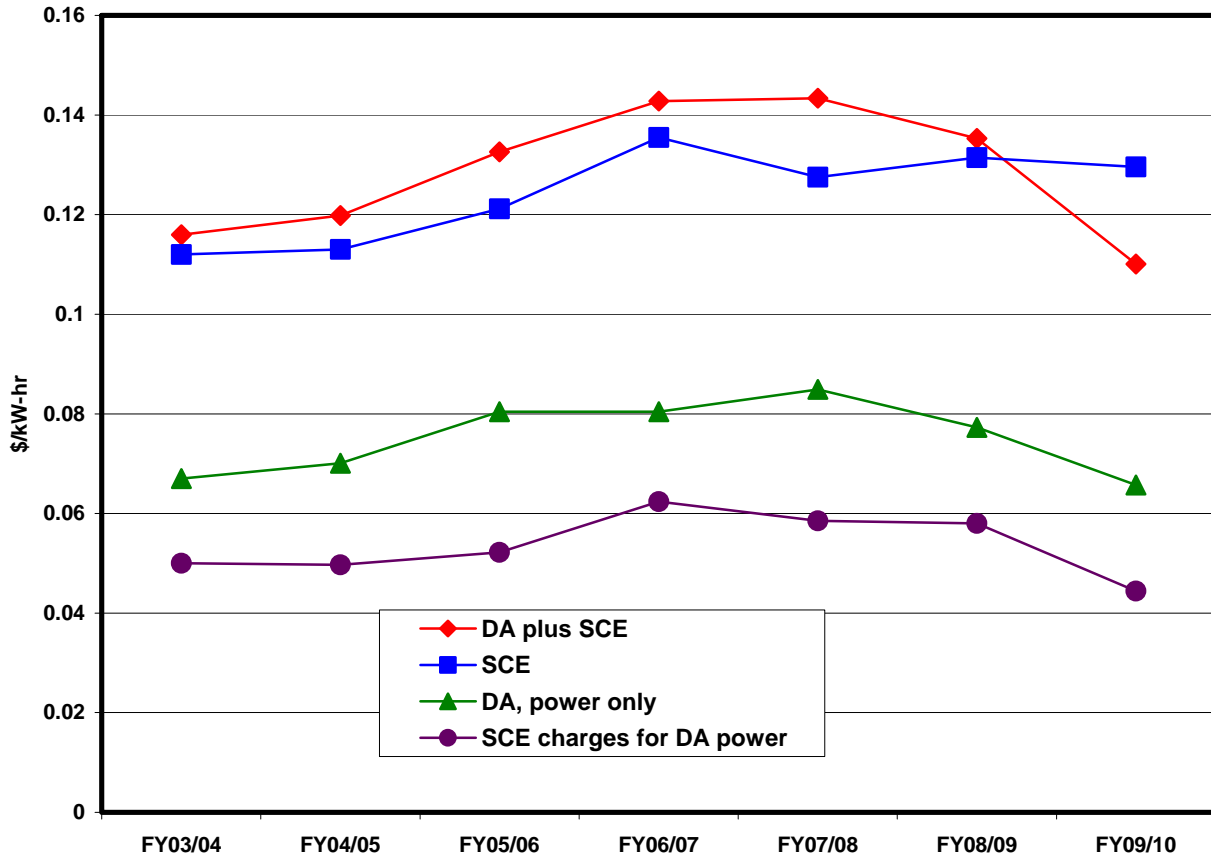


Figure A-2. Natural Gas Rates, 2004-2010

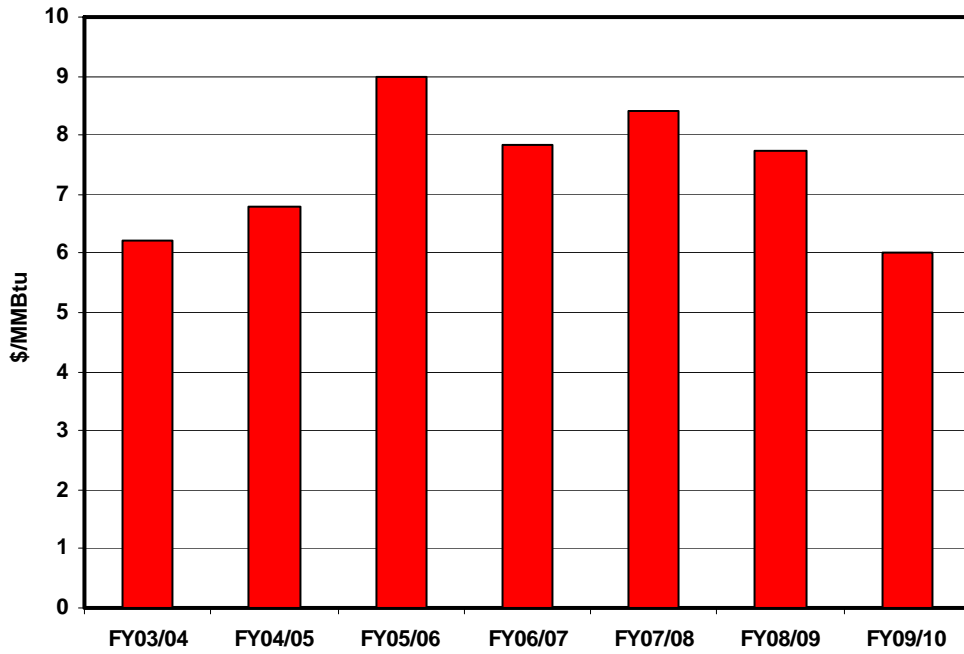


Figure A-3. Natural Gas Usage, 2003-2010

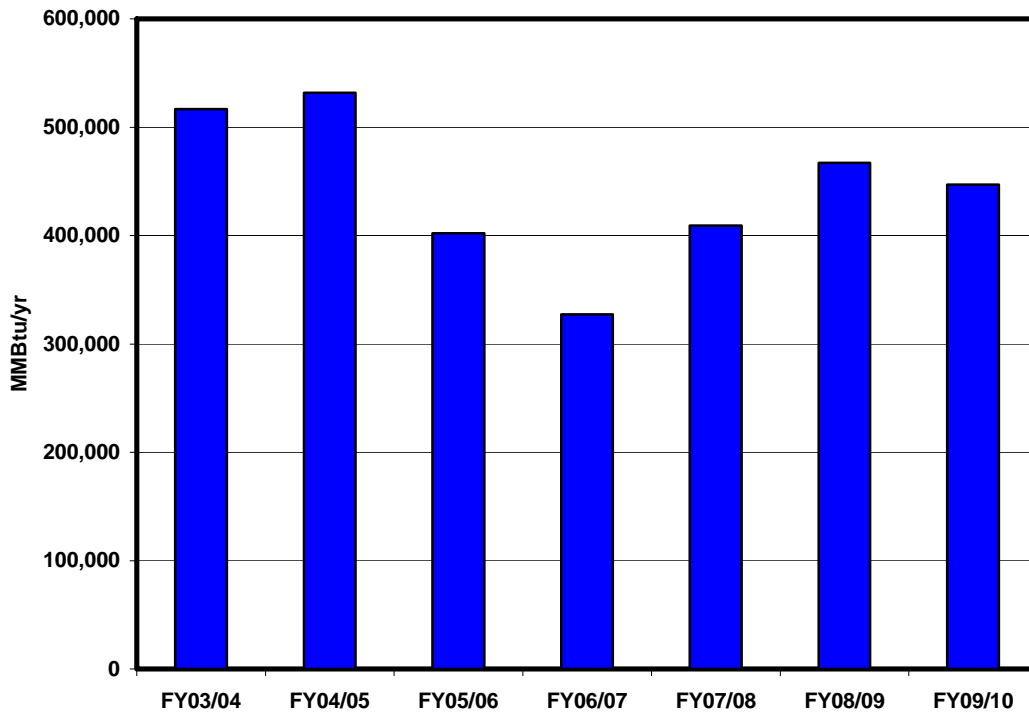


Figure A-4. Vehicle Fuel Rates, 2003-2010

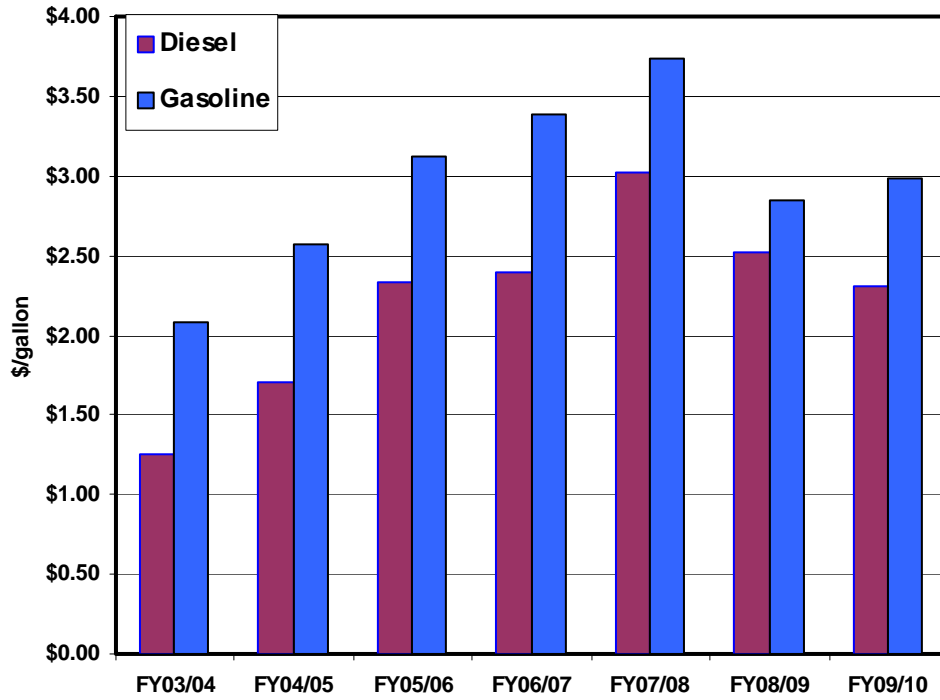


Figure A-5. Vehicle Fuel Usage, 2003-2010

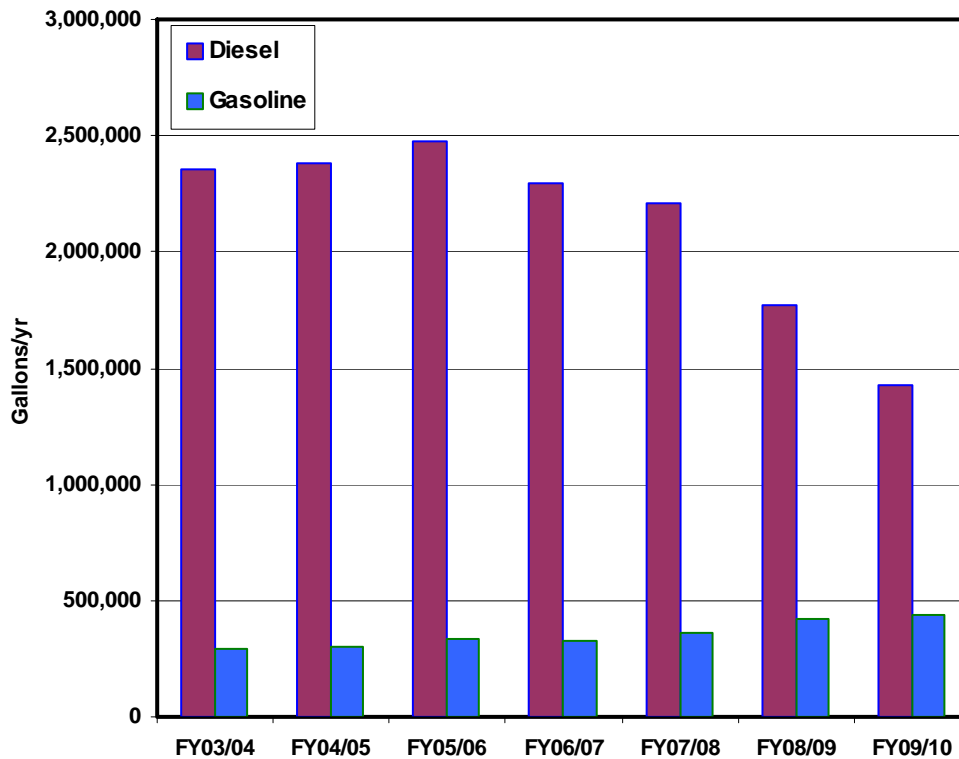


Table A-2. Energy Efficiency Management Program Project Savings

Facility	Measure(s)/Description	FY 06/07 Savings (\$)	FY 07/08 Savings (\$)	FY 08/09 Savings (\$)	FY 09/10 Savings (\$)	Total Savings (\$)
Energy Savings from Capital Projects						
JAO	High Efficiency T8 Fluorescent Lighting Upgrade	\$39,775	\$36,792	\$35,381	\$29,877	\$141,825
Los Coyotes WRP	Influent, Effluent, & RAS Pumps and VFDs	\$192,191	\$572,485	\$550,531	\$464,893	\$1,780,099
Beach Ave Pumping Plant	New motors and VFDs	\$9,395	\$55,972	\$53,826	\$45,453	\$164,646
Los Coyotes WRP	Unit 1 Conversion to Fine Bubble Diffusion	\$29,284	\$366,960	\$352,888	\$297,994	\$1,047,126
Long Beach WRP	New RAS pumps and VFDs	\$0	\$5,431	\$31,339	\$26,464	\$63,234
Diamond Street Pumping Plant	New pumps and VFDs	\$0	\$0	\$14,209	\$16,043	\$30,252
JWPCP	VFDs on Primary Skimmings Odor Control Blowers	\$0	\$0	\$344,076	\$388,468	\$732,545
JWPCP	Gallery Lighting Retrofit to T8 Fluorescent Lighting	\$0	\$0	\$68,754	\$117,081	\$185,835
JWPCP	New Primary Sludge Pumps	\$0	\$0	\$5,347	\$13,509	\$18,857
JWPCP	Four New High Speed Centrifuges	\$0	\$0	\$0	\$234,431	\$234,431
Vesta Street Pumping Plant	New pumps and VFDs	\$0	\$0	\$0	\$12,538	\$12,538
Western Avenue Pumping Plant	New pumps and VFDs	\$0	\$0	\$0	\$7,061	\$7,061
Subtotal		\$270,646	\$1,037,641	\$1,456,351	\$1,653,812	\$4,418,449
Energy Efficiency Rebate Incentives						
JAO	High Efficiency T8 Fluorescent Lighting Upgrade	\$23,800	\$0	\$0	\$0	\$23,800
Los Coyotes WRP	Influent, Effluent, & RAS Pumps and VFDs	\$326,240	\$0	\$0	\$0	\$326,240
Beach Ave Pumping Plant	New motors and VFDs	\$32,571	\$0	\$0	\$0	\$32,571
Los Coyotes WRP	Unit 1 Conversion to Fine Bubble Diffusion	\$209,119	\$0	\$0	\$0	\$209,119
Long Beach WRP	New RAS pumps and VFDs	\$0	\$18,289	\$0	\$0	\$18,289
Diamond Street Pumping Plant	New pumps and VFDs	\$0	\$0	\$11,258	\$0	\$11,258
JWPCP	VFDs on Primary Skimmings Odor Control Blowers	\$0	\$0	\$455,388	\$0	\$455,388
JWPCP	Gallery Lighting Retrofit to T8 Fluorescent Lighting	\$0	\$0	\$51,351	\$0	\$51,351
JWPCP	New Primary Sludge Pumps	\$0	\$0	\$9,480	\$0	\$9,480
JWPCP	Four New High Speed Centrifuges	\$0	\$0	\$0	\$315,345	\$315,345
Vesta Street Pumping Plant	New pumps and VFDs	\$0	\$0	\$0	\$15,149	\$15,149
Western Avenue Pumping Plant	New pumps and VFDs	\$0	\$0	\$0	\$0	\$0
Subtotal		\$591,730	\$18,289	\$527,477	\$330,494	\$1,467,990
Energy Savings from Operational Optimization						
Districts Wide	LCD Monitors	\$852	\$1,460	\$1,404	\$1,186	\$4,901
JWPCP	VFD Turndown on Primary Skimmings Odor Control Blowers	\$0	\$0	\$263,008	\$296,941	\$559,950
JWPCP	Operational Modifications to New High Speed Centrifuges	\$0	\$0	\$0	\$26,177	\$26,177
Pomona WRP	Aeration Optimization	\$0	\$0	\$0	\$115,890	\$115,890
DART	Lighting and Ventilation Optimization	\$0	\$0	\$0	\$14,480	\$14,480
Subtotal		\$852	\$1,460	\$264,412	\$454,673	\$721,397
Income from Demand Response						
San Jose Creek WRP	Demand Response - Flow Bypass to JWPCP	\$0	\$0	\$21,345	\$37,350	\$58,695
Subtotal		\$0	\$0	\$21,345	\$37,350	\$58,695
Savings from Electricity Bill Rate Optimization						
Puente Hills	Service Account Cancelled	\$99	\$180	\$180	\$180	\$639
Lancaster	Rate Restructure	\$14,430	\$29,179	\$29,099	\$29,099	\$101,807
Palmdale	Rate Restructure	\$12,245	\$24,761	\$24,693	\$24,693	\$86,392
Scholl Canyon	Rate Restructure	\$10,389	\$24,066	\$24,000	\$24,000	\$82,455
Scholl Canyon	Rate Restructure	\$18,181	\$42,115	\$42,000	\$42,000	\$144,296
Miscellaneous Accounts	Rate Restructure for Various Pumping Accounts	\$0	\$0	\$0	\$43,231	\$43,231
Miscellaneous Accounts	Various Accounts Cancelled	\$0	\$0	\$0	\$10,309	\$10,309
Subtotal		\$55,343	\$120,300	\$119,972	\$173,512	\$469,128
Savings from Correction of Billing Errors						
Puente Hills IC Engine Plant	Departing load billed on estimated electricity production, upon startup electricity production was lower than had been estimated	\$137,453	\$0	\$0	\$0	\$137,453
Whittier Narrows WRP	Demand billed at 4,019 kW when actual demand was 794 kW	\$0	\$34,416	\$0	\$0	\$34,416
JWPCP	Billed twice by Sempra for energy used from 11/1/09 to 11/3/09	\$0	\$0	\$6,964	\$0	\$6,964
South Bay Cities Pumping Plant	Preferred emergency gear replaced in 8/07, Districts continued to be billed for the old equipment until 9/09	\$0	\$0	\$0	\$25,457	\$25,457
Palmdale WRP	From 5/08 to 10/09 departing load was billed at same level as plant usage resulting in over 2 million kWh in over-billing	\$0	\$0	\$0	\$13,400	\$13,400
Los Coyotes WRP	June 2009 demand billed at 5,478 kW when actual demand was 2,650 kW	\$0	\$0	\$0	\$35,181	\$35,181
White Point Pumping Plant	Billing based on estimated usage that was not adjusted after 2007 installation of VFDs. Reimbursed based on actual reading.	\$0	\$0	\$0	\$144,740	\$144,740
Subtotal		\$137,453	\$34,416	\$6,964	\$218,778	\$397,611
Grand Total		\$1,056,024	\$1,212,106	\$2,396,521	\$2,868,620	\$7,533,271