



# Comparative Energy Analysis Report

*Prepared for*

**Ventura Unified School District**

*Prepared by*

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## 1. Overview

This report is intended to provide a framework for Ventura Unified School District to identify inefficient facilities and prioritize further investigation and energy efficiency retrofit work. This analysis uses only total floor area and energy billing data provided by the Ventura Unified School District to provide an overview of energy use in District facilities and to help identify individual locations with the potential for energy efficiency improvements. Many factors affect the energy use in different facilities, including age, type of heating, ventilation, air conditioning, and lighting equipment, facility occupancy and hours, plug loads, and climate. Once individual facilities with the greatest potential for energy savings are identified, a more detailed screening of those facilities can be performed to identify the specific sources of the inefficiencies. Further analysis can identify inefficient equipment, malfunctioning equipment, equipment not operating as designed, or suboptimal operational procedures.

## 2. Ventura Unified School District Facilities Summary

As identified in **Table 1**, this report presents an analysis of energy consumption data for 29 facilities over the period October 31, 2012 to October 31, 2013. Together these 29 facilities account for 99.9% of the electricity usage data and 99.2% of the gas usage data available for the analysis period. The approximate annual energy cost for all accounts included in this analysis is \$2,230,000 per year. Based on the available utility data, the average electricity cost is \$0.164/kWh and the average gas cost is \$0.762/therm.

The facilities in Ventura Unified School District's portfolio contain about 1,890,000 square feet of floor space. The facility sizes range from 14,860 to 252,746 square feet. In the figures presented in the section "Annual Energy Costs and Usage", annual energy consumption and costs are normalized for square footage in buildings where floor area data are available. Annual energy usage or cost values that have been normalized for floor area are called "intensity" values. **Figure 1** shows the highest, lowest, and median energy cost intensities for the City's portfolio.

Additional details on methodology are presented in the section "Notes on Methodology."

**Table 1 – Energy Comparative Energy Analysis Report Total Energy Cost Summary – Ventura Unified School District– October 31, 2012-October 31, 2013 (Sorted by Annual Energy Cost)**

Facility Name	Annual Electricity Use (kWh/yr)	Annual Electricity Cost (\$/yr)	Average Electricity Rate (\$/kWh)	Annual Gas Use (therm/yr)	Annual Gas Cost (\$/yr)	Average Gas Rate (\$/therm)	Annual Energy Cost (\$/yr)	Energy Cost Intensity (\$/sq.ft./yr)	Annual Energy Intensity (kBtu/sq.ft./yr)
Education Service Center	2,027,146	\$278,817	\$0.14	49,559	\$37,250	\$0.75	\$316,067	\$2.54	214.6
Ventura High School	1,544,767	\$239,685	\$0.16	51,086	\$35,982	\$0.70	\$275,667	\$1.09	85.7
Buena High School	1,464,624	\$230,827	\$0.16	54,468	\$35,515	\$0.65	\$266,342	\$1.28	101.7
Foothill Technology High School	897,893	\$150,079	\$0.17	3,171	\$3,106	\$0.98	\$153,185	\$1.90	123.3
Balboa Middle School	651,560	\$124,680	\$0.19	22,359	\$16,070	\$0.72	\$140,750	\$1.32	86.5
Adult Education	780,837	\$131,368	\$0.17	6,438	\$5,830	\$0.91	\$137,198	\$1.26	82.8
De Anza Middle School	593,872	\$102,360	\$0.17	10,583	\$8,036	\$0.76	\$110,397	\$1.16	78.1
Cabrillo Middle School	423,153	\$69,498	\$0.16	10,074	\$8,685	\$0.86	\$78,184	\$0.79	55.8
Anacapa Middle School	356,920	\$68,111	\$0.19	6,749	\$5,451	\$0.81	\$73,562	\$0.90	55.0
Citrus Glen Elementary School	406,268	\$64,816	\$0.16	2,787	\$2,604	\$0.93	\$67,420	\$1.24	85.0
Portola Elementary School	296,319	\$62,869	\$0.21	1,852	\$1,914	\$1.03	\$64,783	\$1.41	72.9
Sheridan Way Elementary School	273,152	\$44,500	\$0.16	7,914	\$6,249	\$0.79	\$50,749	\$1.17	85.7
Sunset Elementary School	254,158	\$47,116	\$0.19	3,514	\$3,012	\$0.86	\$50,128	\$1.59	97.3
Junipero Serra Elementary School	173,093	\$31,732	\$0.18	6,112	\$4,919	\$0.80	\$36,651	\$0.75	50.2
Saticoy Elementary School	185,541	\$33,024	\$0.18	3,994	\$3,546	\$0.89	\$36,570	\$0.77	50.0
E.P. Foster Elementary School	167,810	\$31,373	\$0.19	5,497	\$4,544	\$0.83	\$35,917	\$0.88	57.7
Will Rogers Elementary School	191,981	\$30,438	\$0.16	5,527	\$4,702	\$0.85	\$35,140	\$0.94	69.5
Elmhurst Elementary School	161,995	\$30,279	\$0.19	3,671	\$3,152	\$0.86	\$33,431	\$0.84	52.6
Poinsettia Elementary School	163,481	\$28,523	\$0.17	4,284	\$3,595	\$0.84	\$32,118	\$0.88	59.5
Mound Elementary School	164,621	\$28,622	\$0.17	4,065	\$3,434	\$0.84	\$32,056	\$0.79	53.7
Blanche Reynolds Elementary School	140,303	\$24,424	\$0.17	6,621	\$5,302	\$0.80	\$29,725	\$0.80	58.1
Montalvo Elementary School	143,990	\$25,436	\$0.18	4,398	\$4,071	\$0.93	\$29,507	\$0.83	55.5
Loma Vista Elementary School	144,089	\$25,336	\$0.18	5,096	\$4,131	\$0.81	\$29,467	\$0.88	61.3
Juanamaria Elementary School	144,359	\$24,606	\$0.17	4,555	\$3,835	\$0.84	\$28,442	\$0.77	54.1
Pacific-El Camino High School	128,859	\$21,610	\$0.17	8,265	\$6,504	\$0.79	\$28,114	\$0.58	45.7
Facilities Services	119,129	\$18,388	\$0.15	1,877	\$1,891	\$1.01	\$20,279	\$0.96	69.3
Lincoln Elementary School	82,094	\$15,713	\$0.19	2,496	\$2,368	\$0.95	\$18,081	\$0.88	54.7
Pierpont Elementary School	67,351	\$13,695	\$0.20	2,387	\$2,262	\$0.95	\$15,957	\$0.93	56.2
Day Road Project Source	2,004	\$612	\$0.31	252	\$415	\$1.65	\$1,028	\$0.07	3.1
<b>Total</b>	12,151,370	\$1,998,537		299,654	\$228,376		\$2,226,914		
<b>% of Total</b>		<b>90% of Energy Costs</b>			<b>10% of Energy Costs</b>		<b>100% of Energy Costs</b>		

**Figure 1 - Annual Energy Costs and Cost Intensities for Ventura Unified School District Facilities**

	\$2.54	<b>Ventura USD Highest Cost Intensity</b> (Education Service Center)	\$316,067	
\$/sq.ft.	\$0.90	<b>Ventura USD Median Cost Intensity</b> (Anacapa Middle School)	\$73,562	\$/facility
	\$0.58	<b>Ventura USD Lowest Cost Intensity*</b> (Pacific-El Camino High School)	\$28,114	

\*Day Road Project Source excluded due to abnormally small energy intensity

### 3. Annual Energy Costs and Usage in Ventura Unified School District Facilities

Figures 2 – 3 provide graphical comparisons of the energy cost, cost intensity, energy use, and energy use intensity of the facilities in this analysis. Figures 2.1 and 2.2 show the facilities with the highest energy costs and cost intensities including both gas and electricity data. Figures 3.1 – 3.8 show the facilities with the highest electricity costs; highest gas costs; highest electricity cost intensities; highest gas cost intensities; highest electricity usage; highest gas usage; highest electricity usage intensities; and highest gas usage intensities, respectively. Table of Figures on p. ii above provides a list of all figures in this report.

Figure 2.1 – Facilities with Highest Total Annual Energy Cost (\$)

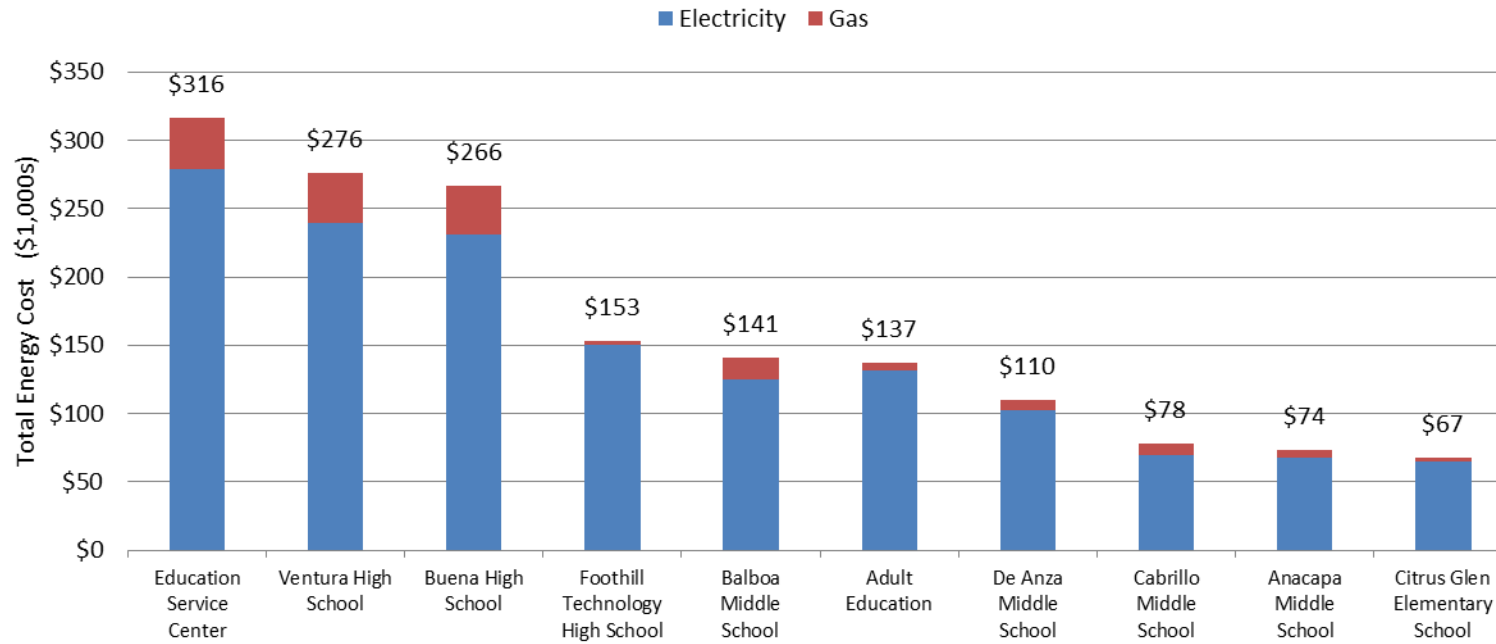




Figure 2.2 – Facilities with Highest Annual Energy Cost Intensity (\$/sq.ft.)

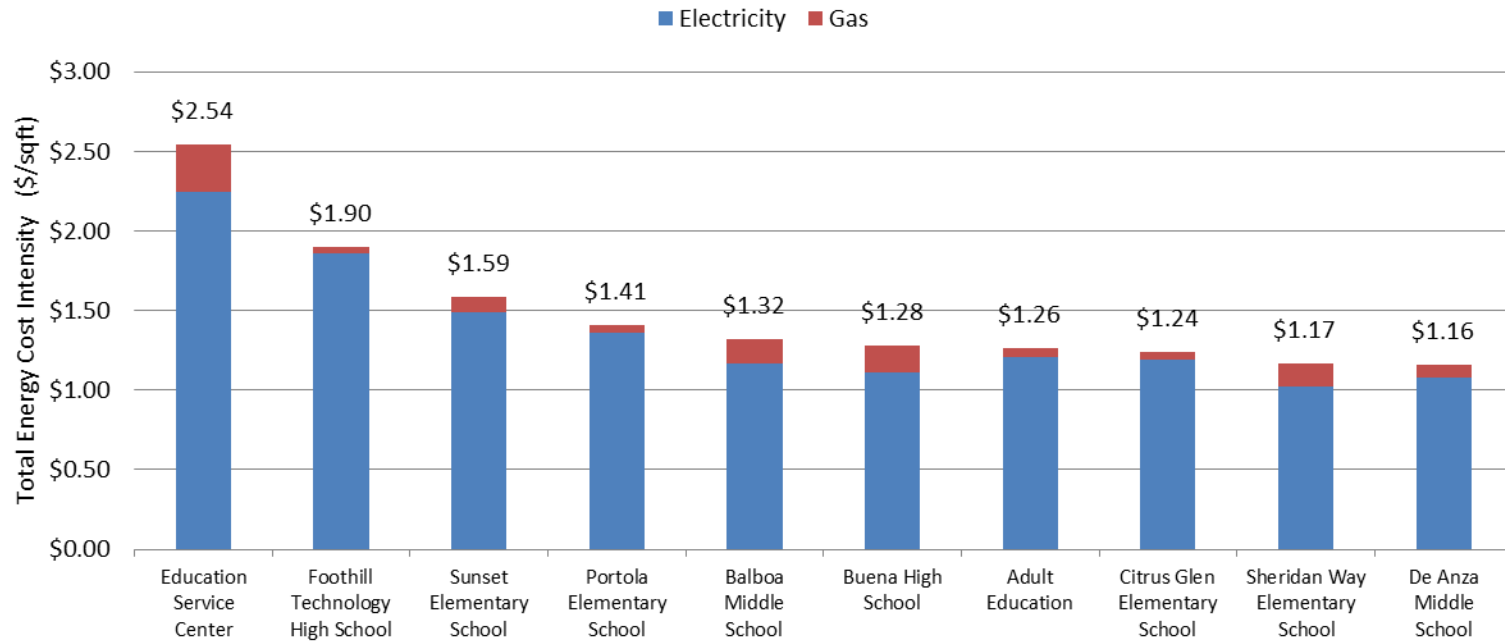


Figure 3.1 – Facilities with Highest Total Annual Electricity Cost (\$)

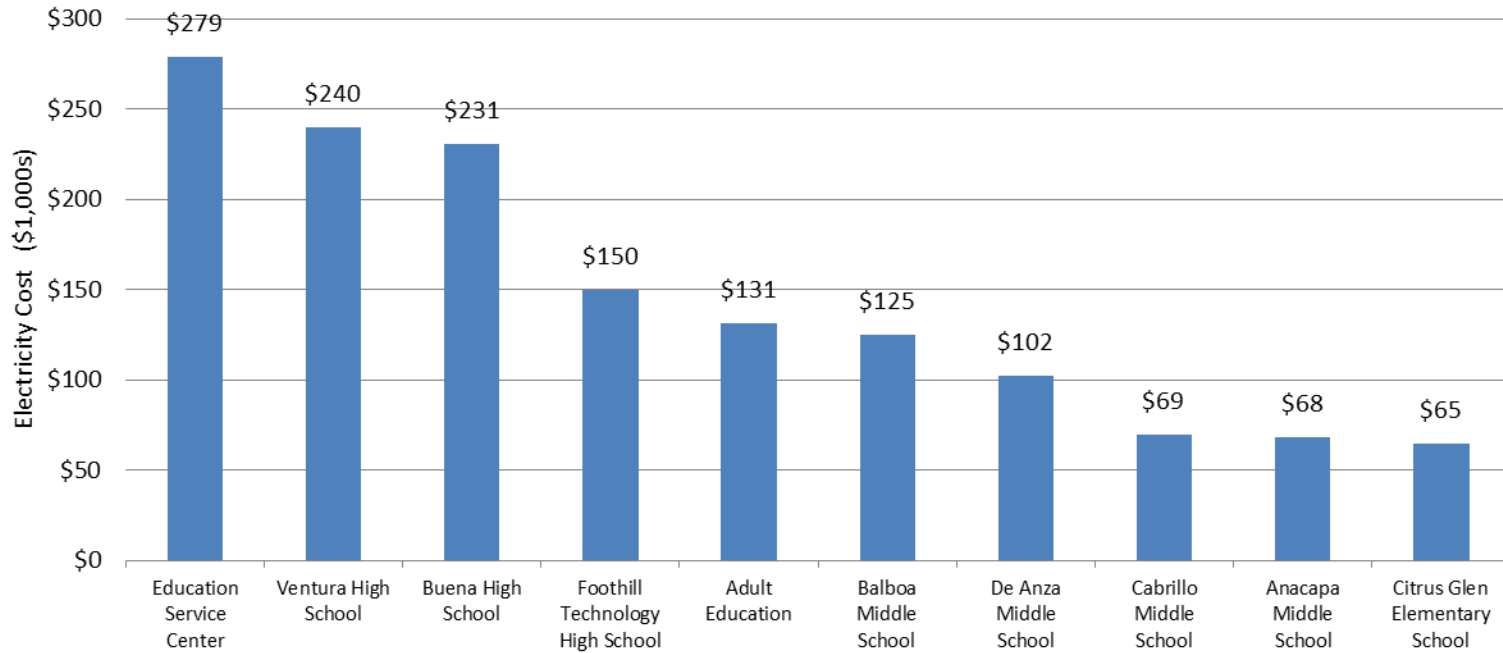


Figure 3.2 – Facilities with Highest Total Annual Gas Cost (\$)

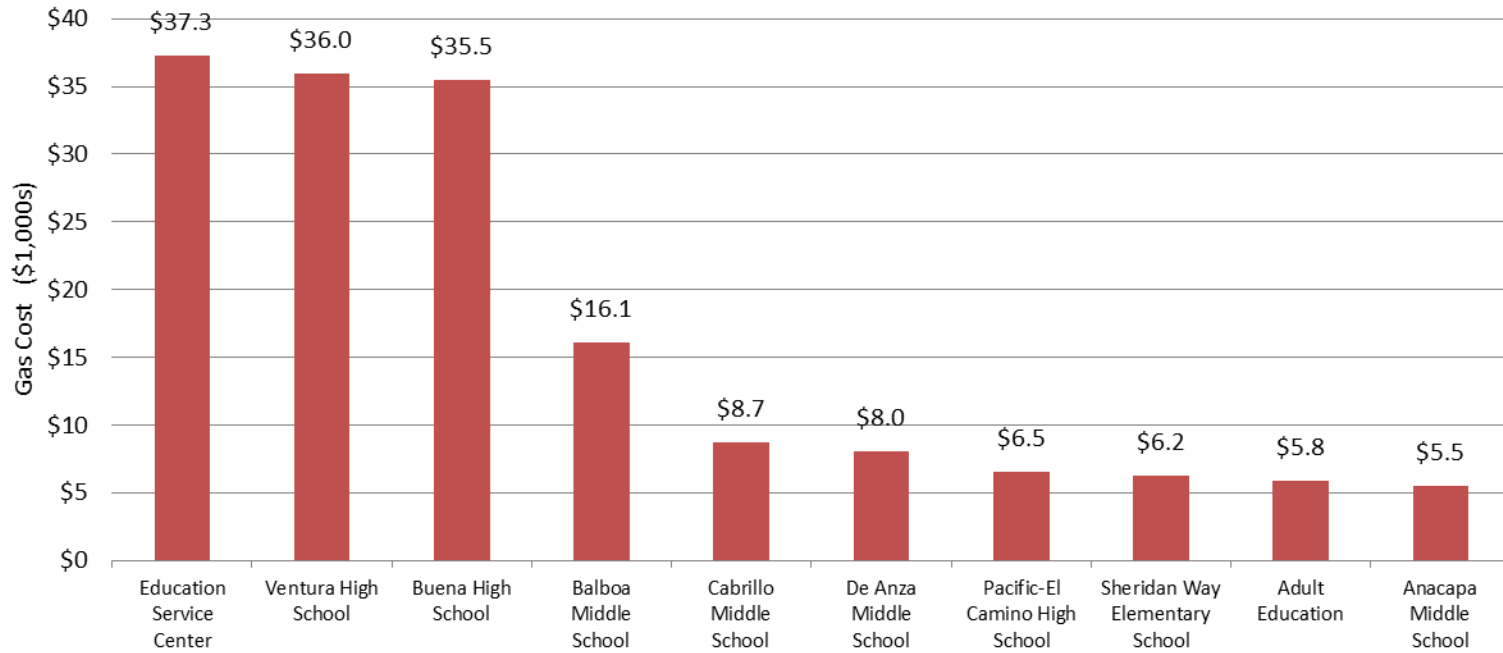


Figure 3.3 – Facilities with Highest Annual Electricity Cost Intensity (\$/sq.ft.)

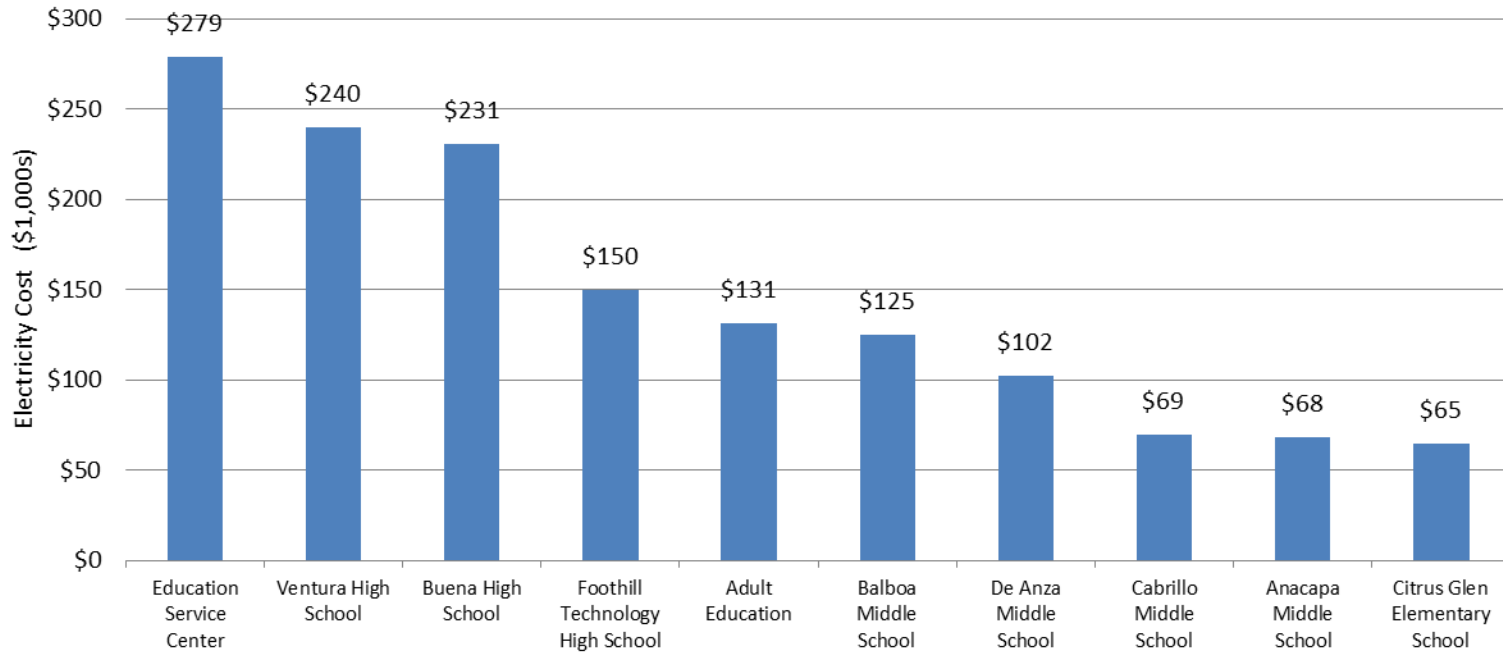


Figure 3.4 – Facilities with Highest Annual Gas Cost Intensity (\$/sq.ft.)

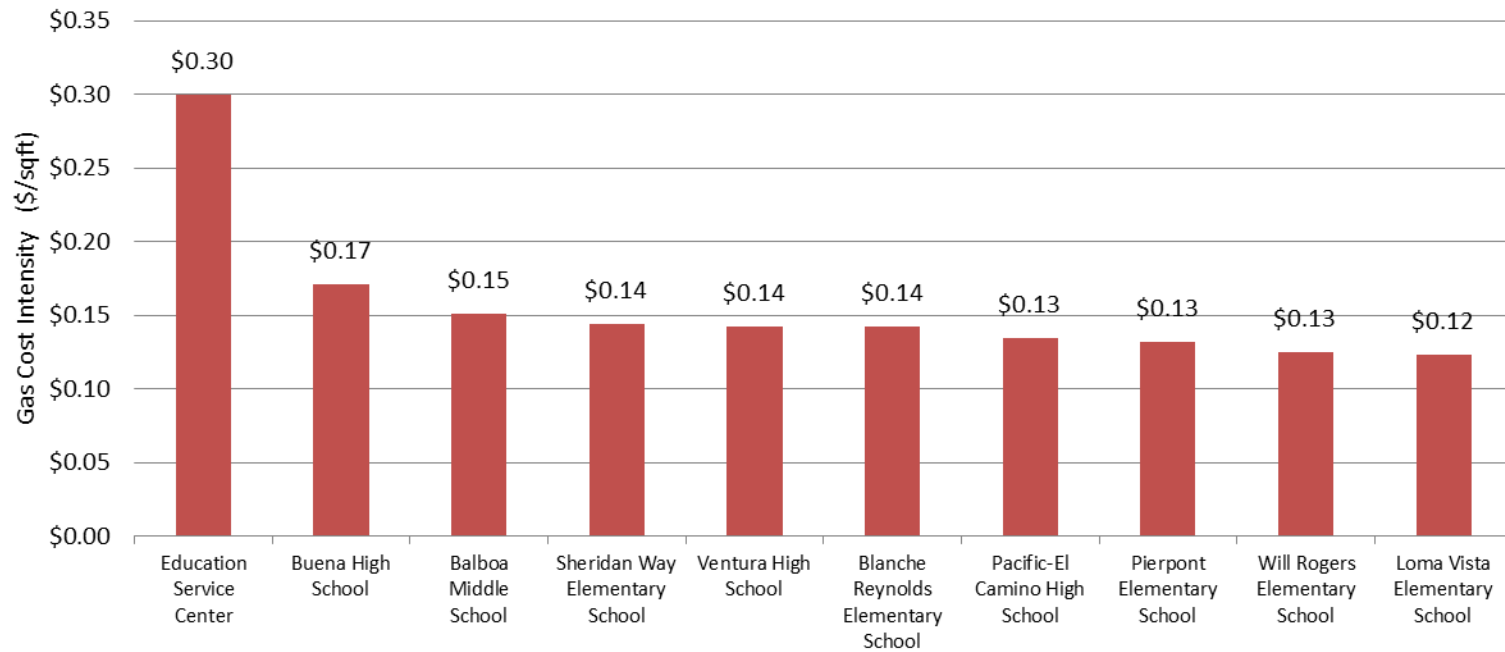


Figure 3.5 – Facilities with Highest Annual Electricity Use (kWh)

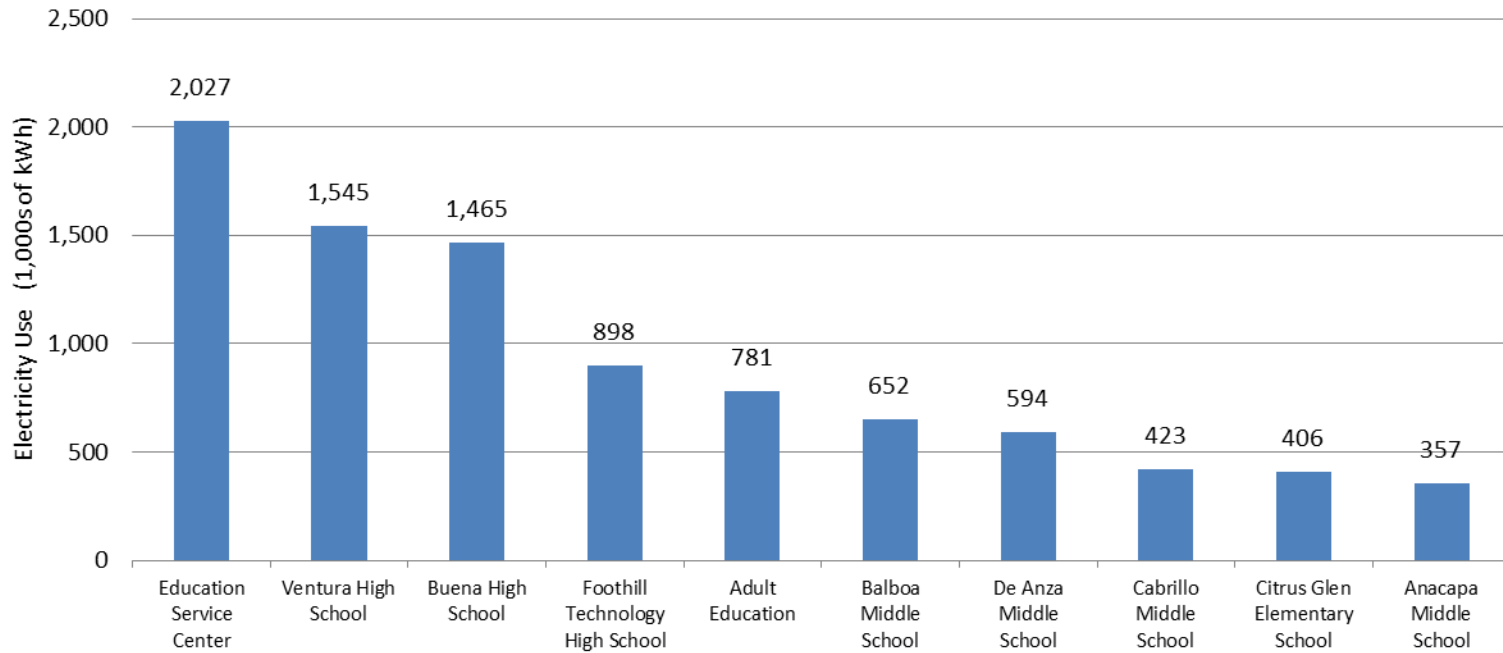


Figure 3.6 – Facilities with Highest Total Annual Gas Use (therms)

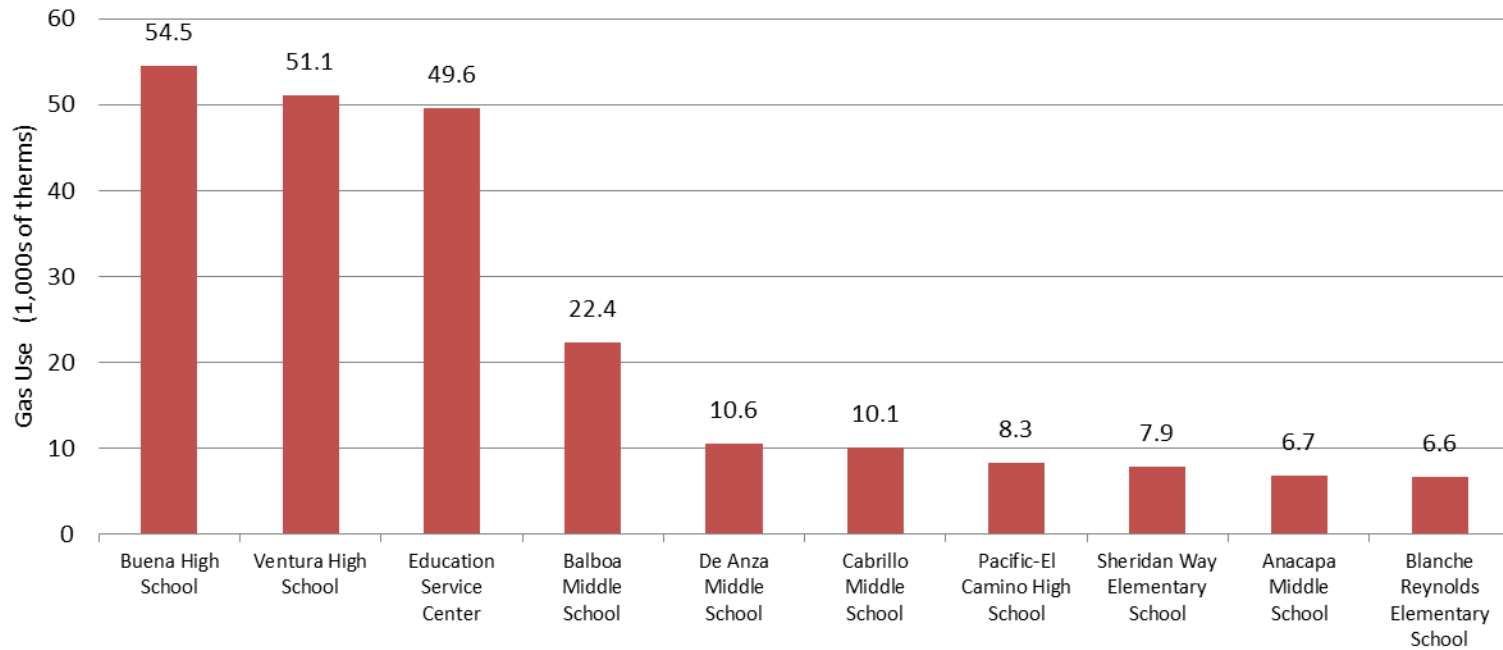


Figure 3.7 – Facilities with Highest Annual Electricity Use Intensity (kWh/sq.ft.)

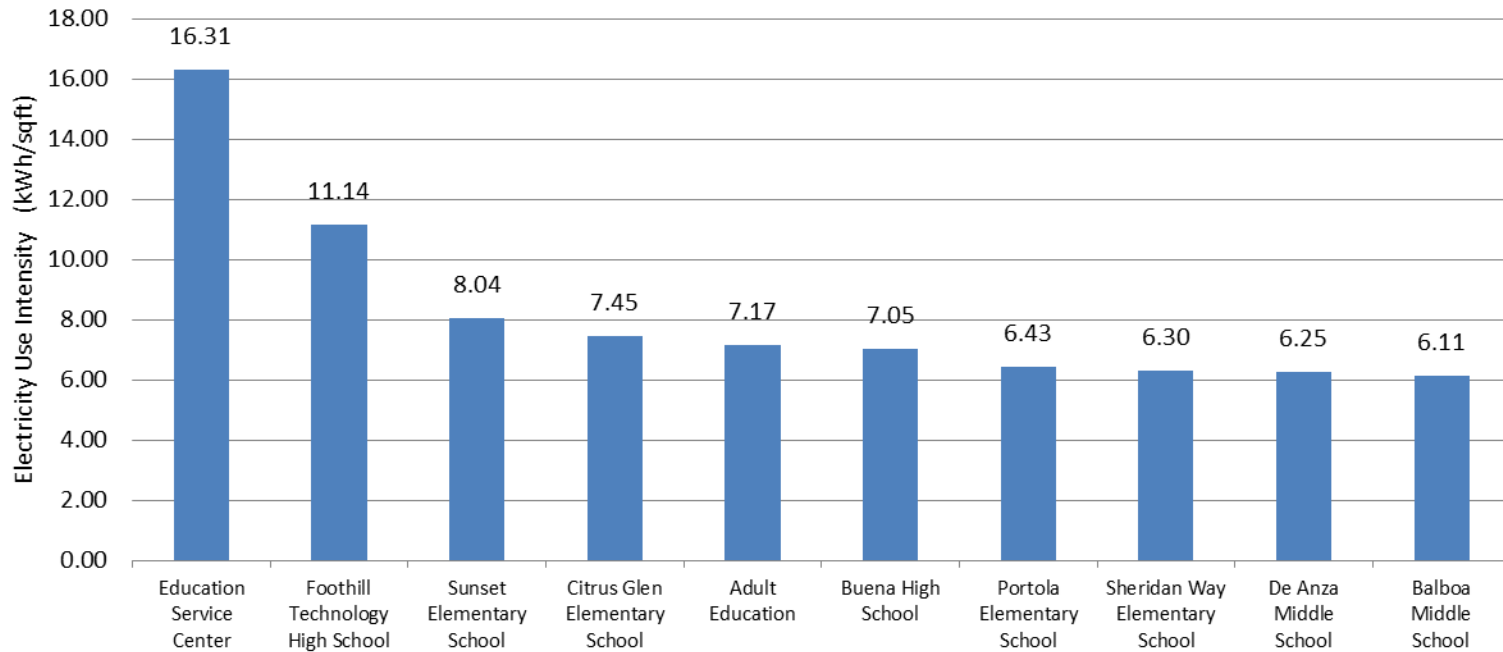
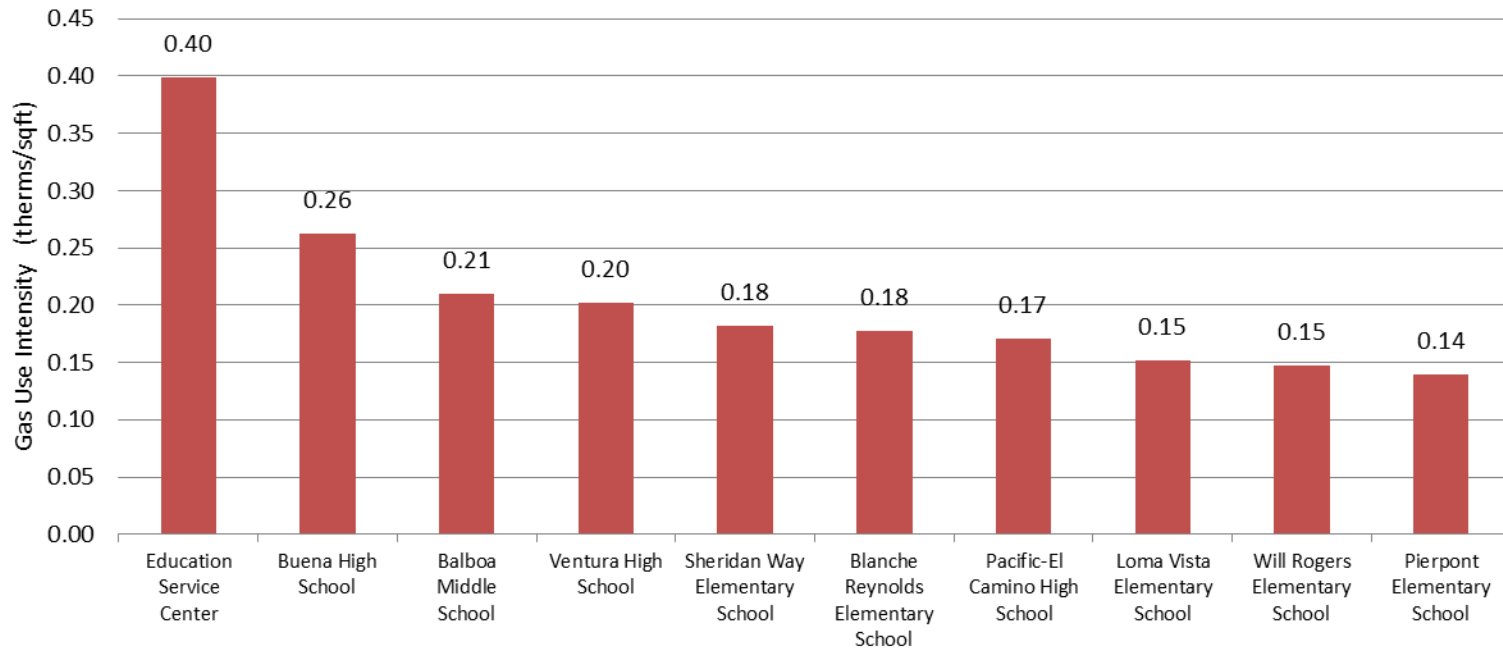




Figure 3.8 – Facilities with Highest Annual Gas Use Intensity (therms/sq.ft.)



#### 4. Notes on Methodology

- All electricity and gas results were based on usage during period October 31, 2012 – October 31, 2013.
- Energy usage and cost data used in this analysis were derived from utility billing data provided by District staff.
- Monthly usage data from individual meters were assigned to the District facilities using a combination of matching information provided by District staff and supplemental research.
- Highest, median and lowest energy cost intensities in Figure 1 were calculated excluding the Day Road Project Source facility due to abnormally low energy intensity.
- Energy intensity values reported in Table 1 were calculated assuming 10,716 Btu/kWh per the California Energy Commission's Proposition 39: California Jobs Act -2013 Program Implementation Draft Guidelines (footnote in Exhibit D, p. 45).
- Facility names, types, and floor area information for most facilities were provided by District staff. Errors in floor area information can have a significant effect on energy intensity calculations. It is recommended that all floor area information be verified as part of any closer investigation of facilities analyzed in this report.
- In some cases, multiple meters were associated with a single facility or asset type. For such facilities, to generate estimates of facility-wide energy use and energy intensity, energy usage and cost values were aggregating by summing the average daily energy usage and cost values for each day in the analysis period.
- The electric meters matched to specific facilities included in this analysis accounted for 99.9% of electricity usage and 98% of electricity costs during the analysis period.
- The gas meters matched to specific facilities included in this analysis accounted for approximately 99.2% of gas usage and 99.0% of gas costs during the analysis period.
- Facility Services is not metered separately from Ventura High, so its energy usage was assumed to be proportional to its share of the total floor area associated with Ventura High and Facility Services combined. Ventura High School usage and cost values associated with meter V349N-017953 were reduced by the amount allocated to Facility Services.

**Table 2 – Facilities Included in Analysis**

Facility Name	Street	Electricity Data Interval	Gas Data Interval	Facility Type	Area (sq.ft.)
Adult Education	5200 Valentine Rd.	monthly	monthly	Education/School	108,837
Anacapa Middle School	100 S. Mills Rd.	monthly	monthly	Education/School	81,755
Balboa Middle School	247 South Hill Rd.	monthly	monthly	Education/School	106,578
Blanche Reynolds Elementary School	450 Valmore Ave.	monthly	monthly	Education/School	37,249
Buena High School	5670 Telegraph Rd.	monthly	monthly	Education/School	207,884
Cabrillo Middle School	1426 E. Santa Clara St.	monthly	monthly	Education/School	99,302
Citrus Glen Elementary School	9655 Darling Rd.	monthly	monthly	Education/School	54,507
Day Road Project Source	150 N. Day Rd.	monthly	monthly	Education/School	14,860
De Anza Middle School	2060 Cameron St.	monthly	monthly	Education/School	95,041
E.P. Foster Elementary School	20 Pleasant Place	monthly	monthly	Education/School	40,660
Education Service Center	255 W. Stanley Ave.	monthly	monthly	Education/School	124,300
Elmhurst Elementary School	5080 Elmhurst St.	monthly	monthly	Education/School	40,010
Facilities Services	359 S. Victoria Ave.	monthly	monthly	Education/School	21,120
Foothill Technology High School	100 N. Day Rd.	monthly	monthly	Education/School	80,585
Juanamaria Elementary School	100 S. Crocker St.	monthly	monthly	Education/School	37,000
Junipero Serra Elementary School	8880 Halifax St.	monthly	monthly	Education/School	49,107
Lincoln Elementary School	1107 E. Santa Clara St.	monthly	monthly	Education/School	20,634
Loma Vista Elementary School	300 Lynn Dr.	monthly	monthly	Education/School	33,476
Montalvo Elementary School	2050 Grand Ave.	monthly	monthly	Education/School	35,704
Mound Elementary School	455 S. Hill Rd.	monthly	monthly	Education/School	40,385
Pacific-El Camino High School	501 College Dr.	monthly	monthly	Education/School	48,289
Pierpont Elementary School	1254 Martha's Vineyard Ct.	monthly	monthly	Education/School	17,100
Poinsettia Elementary School	350 N. Victoria Ave.	monthly	monthly	Education/School	36,650
Portola Elementary School	1350 Partridge Dr.	monthly	monthly	Education/School	46,079
Saticoy Elementary School	760 Jazmin Ave.	monthly	monthly	Education/School	47,750
Sheridan Way Elementary School	573 Sheridan Way	monthly	monthly	Education/School	43,379