



Comparative Energy Analysis Report

Prepared for
City of Fullerton

Prepared by
The Energy Coalition

On Behalf of
The Southern California Regional Energy Network Public Agency Project Delivery Programs

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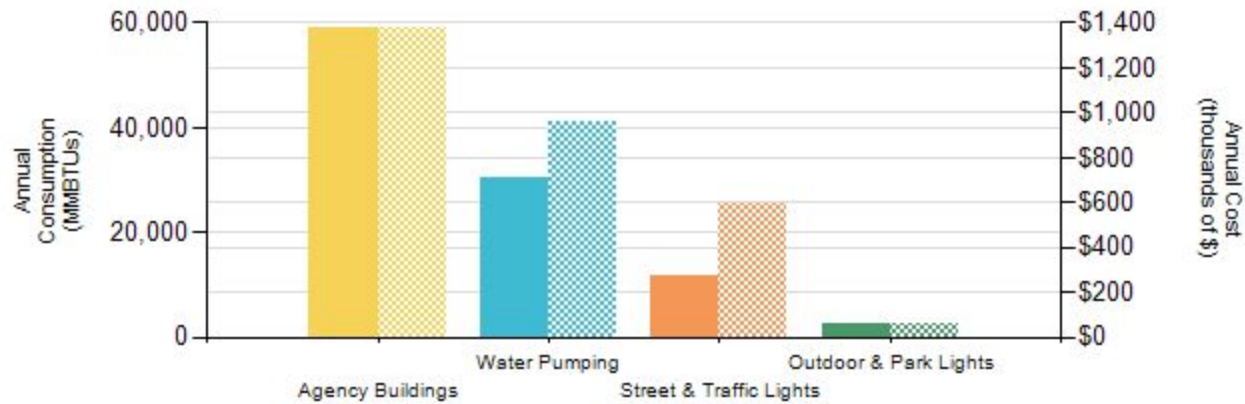
1. Overview

This report is intended to provide a framework for the City of Fullerton, referred to as “Agency” herein, to identify inefficient facilities and infrastructure and prioritize further investigation and energy efficiency retrofit work. This analysis uses only energy billing data provided by the Agency to analyze energy use across Agency assets, and to help identify opportunities for energy efficiency improvements. Many factors affect the energy use in different assets, including age, type of heating, ventilation, air conditioning (HVAC), and lighting equipment, facility occupancy and hours, plug loads, and climate. Once individual opportunities 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.

This report was created by The Energy Coalition on behalf of the Southern California Regional Network (www.socalren.org). Any questions about this report can be directed to your assigned Project Manager, Megan Ong at mong@energycoalition.org.

2. Total Energy Portfolio

Your Total Annual Energy Cost is **\$2,980,208**



Key: Solid color represents consumption, hashed color represents cost

Annual Energy Costs

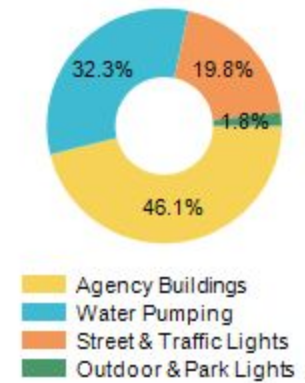


Table 1: Total Energy Portfolio (Annual)

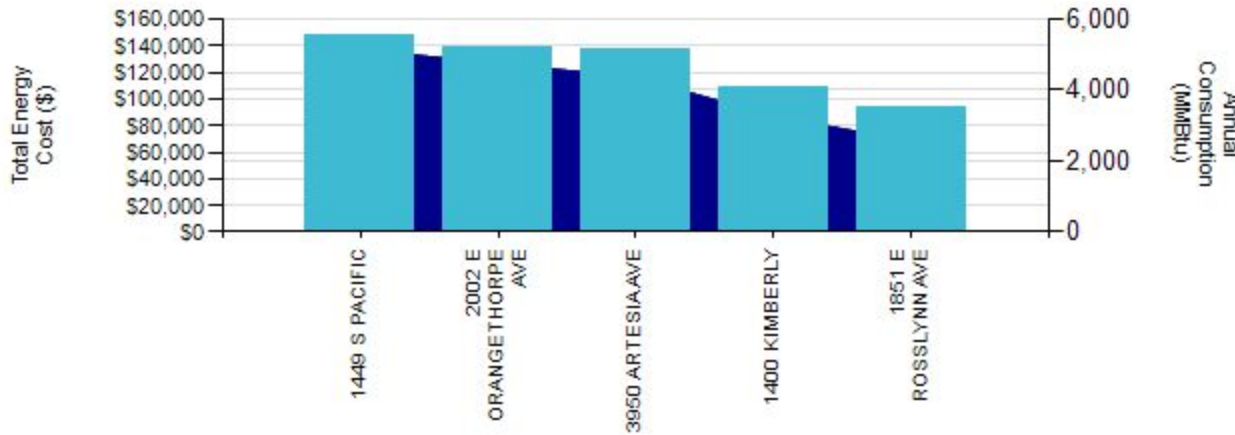
Agency Energy Use	Electric Consumption (kWh)	Electric Cost (\$)	Gas Consumption (therms)	Gas Cost (\$)	Total Energy Consumption (MMBTus)	Total Energy Cost (\$)	GHG Emissions (lbs CO ₂)
Agency Buildings	7,395,455	\$1,164,093	338,797	\$209,139	59,113	\$1,373,232	3,823,450
Water Pumping	8,786,088	\$959,021	3,067	\$2,941	30,285	\$961,962	4,542,407
Street & Traffic Lights	3,434,819	\$589,892	0	\$0	11,720	\$589,892	1,775,801
Outdoor & Park Lights	719,548	\$55,122	0	\$0	2,455	\$55,122	372,006



3. Water Pumping



Your Annual Energy Cost for Water Pumping is **\$961,962** and **32.3%** of the Total Cost.



Key: Displays the top 5 consuming pumping service accounts. Columns represent Cost, Area represents Consumption.

Table 2: Water Pumping (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)
1449 S PACIFIC	1449 S PACIFIC	1,505,513	\$148,594	\$0.10
2002 E ORANGETHORPE AVE	2002 E ORANGETHORPE AVE	1,388,247	\$139,380	\$0.10
3950 ARTESIA AVE	3950 ARTESIA AVE	1,277,347	\$136,804	\$0.11

Assumption - 65% of all pumps need to be upgraded. Those pumps will reduce consumption by 7.5% kWh post retrofit.

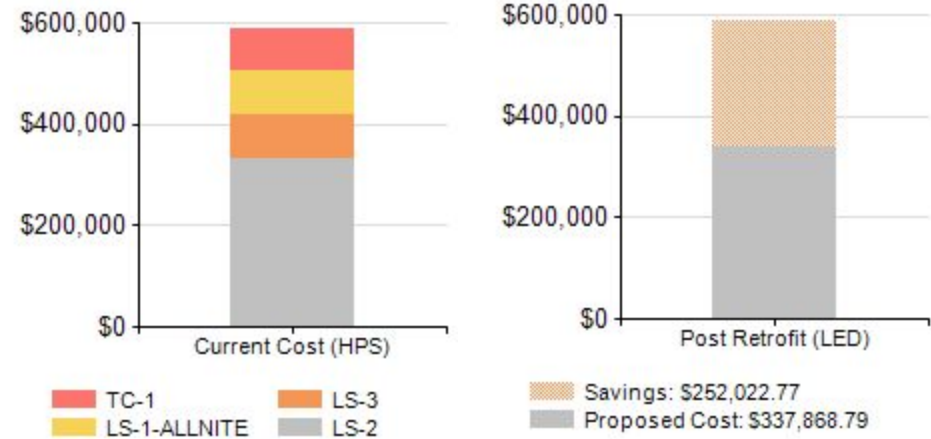
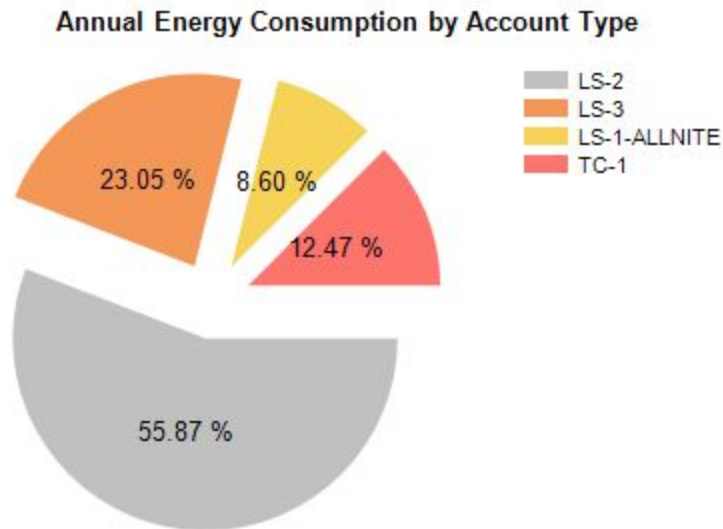
Calculation - projected savings are 7.5% of 65% of the total PA consumption (for ALL pump accounts)

1400 KIMBERLY	1400 KIMBERLY	955,880	\$108,970	\$0.11
1851 E ROSSLYNN AVE	1851 E ROSSLYNN AVE	748,319	\$93,839	\$0.13

4. Street & Traffic Lights



Your Annual Energy Cost for Street & Traffic Lights is **\$589,892** and **19.8%** of the Total Cost.



Assumption -agencies can save 50% on annual street & traffic light kWh consumption by converting HPS to LED.

Calculation – projected savings are 50% of the total kWh consumption of agency owned street and traffic lights (TC-1, LS-2, and LS-3). LS-1 street lights are not included in projected savings.

Table 3: Street & Traffic Lights (Annual)

Tariff	Tariff Description	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)
LS-2	Street Lights (Agency Owned - unmetered)	1,919,069	\$331,807	0.17
LS-3	Street Lights (Agency Owned - metered)	791,876	\$87,537	0.11

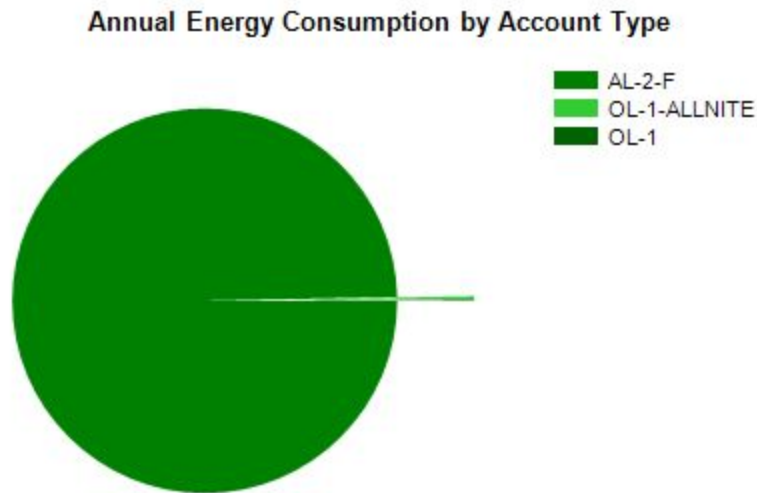
LS-1-ALLNITE	Street Lights (SCE Owned)	295,420	\$85,846	0.29
TC-1	Traffic Signal Lights (Agency Owned)	428,454	\$84,702	0.20

PUBLIC WORKS CORP YARD	1600 W COMMONWEALTH AVE	596,006	\$97,460	\$0.16	155,801	\$80,826	\$0.52	YES
CITY JAIL	237 W COMMONWEALTH AVE	1,206,023	\$171,174	\$0.14	0	\$0	\$0.00	YES
INDEPENDENCE PARK	801 W VALENCIA DR	631,530	\$85,446	\$0.14	119,611	\$76,515	\$0.64	YES
COMMUNITY CENTER	340 W COMMONWEALTH AVE	918,425	\$126,467	\$0.14	36,553	\$27,594	\$0.75	YES
PUBLIC LIBRARY	353 W COMMONWEALTH AVE	901,009	\$128,394	\$0.14	10,920	\$9,019	\$0.83	YES
CITY HALL	303 W COMMONWEALTH AVE	812,633	\$128,396	\$0.16	9,950	\$8,227	\$0.83	YES
LION'S FIELD	1440 BREA BLVD A	117,681	\$43,695	\$0.37	0	\$0	\$0.00	YES
FIRE DEPARTMENT HQ	312 E COMMONWEALTH AVE	229,779	\$35,227	\$0.15	2,932	\$2,972	\$1.01	YES
MUSEUM CENTER	301 N POMONA AVE	174,875	\$31,338	\$0.18	0	\$0	\$0.00	YES
HILLCREST PARK	1200 N HARBOR BLVD	143,378	\$20,847	\$0.15	0	\$0	\$0.00	YES

6. Outdoor & Park Lights



Your Annual Energy Cost for Outdoor & Park Lights is **\$55,122** and **1.8%** of the Total Cost.



Assumption -agencies can save 50% on annual outdoor & park light kWh consumption by converting HPS to LED.

Calculation – projected savings are 50% of the total kWh consumption of outdoor & park lights.

Table 5: Outdoor & Park Lights (Annual)

Name	Address	Tariff	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)
Area Lighting	Various	AL-2-F	717,244	\$54,619	\$0.08
Area Lighting	Various	OL-1-ALLNITE	1,824	\$379	\$0.21



Area Lighting	Various	OL-1	480	\$124	\$0.26
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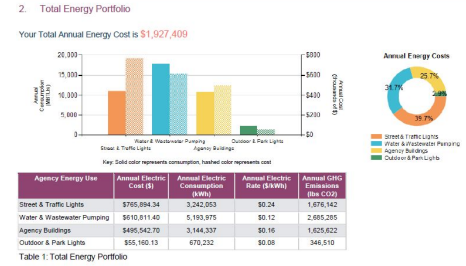
Appendix A - Methodology

1. Data Sources

- Building information, energy usage and cost data used in this analysis were derived from utility consumption billing data provided by agency staff.
- Utility consumption billing data used in this analysis were derived from SCG gas tariffs and SCE electric tariffs
- For more information about the utility tariffs included in this analysis refer to:
 - SCG Gas Tariffs: [For more information about Southern California Gas tariffs;](https://www.socalgas.com/regulatory/tariffs/tariffs-rates.shtml)
<https://www.socalgas.com/regulatory/tariffs/tariffs-rates.shtml>
 - SCE Electric Tariff: [For more information about Southern California Edison tariffs;](https://www.sce.com/wps/portal/home/regulatory/tariff-books/rates-pricing-choices)
<https://www.sce.com/wps/portal/home/regulatory/tariff-books/rates-pricing-choices>
- Analysis period for electricity and gas results were based on usage during period January 1, 2019 – December 31, 2019.
- 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, energy usage and cost values were aggregated by summing energy usage and cost values for each day in the analysis period.
- GHG emissions data used in this analysis were calculated using the conversion: 517 lb CO₂/MWh + 11.91 lbs CO₂/therm [1,2].

2. Total Energy Portfolio

- Total Energy Portfolio data represents an analysis of each agency facility type annual energy costs, annual energy consumption (kWh and therms), GHG Emissions and total annual energy costs for agency facility types based on MMBtus.
- The following agency assets are included in the Total Energy Portfolio:
 - Water Pumping
 - Street & Traffic Lights
 - Buildings
 - Outdoor & Parks Lights



3. Water Pumping

- Water pumping data represents an analysis of the top five highest energy consuming water and wastewater pumping SCE and SCG service accounts annual energy costs, annual energy consumption (kWh and therms) and total annual energy costs.
- Water pump conversion data used in this analysis is derived on the assumption that 65% of all existing pumps need to be upgraded. Of the 65% of pumps requiring upgrades, it is assumed that the pumps will save 7.5% of their annual kWh consumption [3].

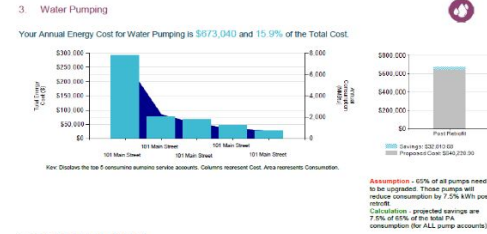


Table 2. Water Pumping (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)
101 Main Street	101 Main Street	2,129,639	\$290,036	\$0.14
101 Main Street	101 Main Street	656,828	\$77,613	\$0.12
101 Main Street	101 Main Street	403,374	\$66,556	\$0.17
101 Main Street	101 Main Street	265,853	\$49,226	\$0.19
101 Main Street	101 Main Street	217,347	\$27,681	\$0.13

4. Street & Traffic Lights

- Street & traffic light data represents an analysis of annual energy costs and annual energy consumption (kWh) per SCE street & traffic light tariff type.
- Annual cost savings reflects only agency owned street lights in the analysis; assumed cost savings conversion is based on converting HPS to LED agency owned traffic and street lights [3].
- On average, agencies can save 50% on annual kWh consumption by converting HPS to LED, which also results in cost savings [3].

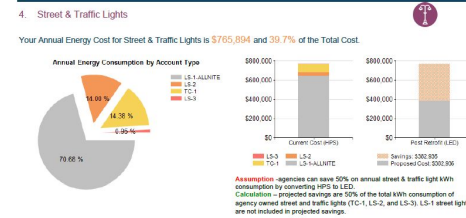


Table 3. Street & Traffic Lights

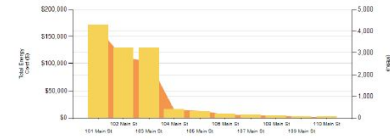
Light Type	Light Description	Annual Electric Consumption (kWh)	Annual Electric Cost (\$)
LS-1-ALLNITE	Street Lights (SCE Owned)	2,395,241	\$647,874
TC-1	Traffic Lights (Agency Owned)	465,684	\$61,733
LS-2	Street Lights (Agency Owned)	453,399	\$39,440
LS-3	Street Lights (Agency Owned)	30,652	\$3,023

5. Building Summary

- Building summary data is weather normalized and includes the following metrics for the top ten highest energy-consuming agency buildings' (total annual energy costs): annual energy costs and annual energy consumption (kWh and therms).

5. Building Summary

Your Annual Energy Cost for Buildings is \$492,495 and 25.7% of the Total Cost.



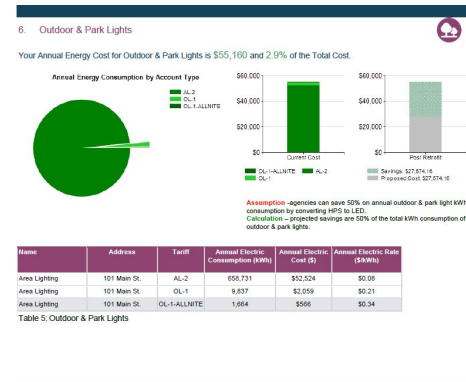
Key: Displays the top 10 consuming buildings. Columns represent Cost, Area represents Consumption.

Name	Address	Annual Electric Consumption (kWh)	Annual Electric Cost (\$)	Annual Electric Rate (cents/kWh)
101 Main St	101 Main St	1,250,834	\$172,038	\$0.14
102 Main St	102 Main St	801,456	\$126,106	\$0.16
103 Main St	103 Main St	761,790	\$129,046	\$0.17
104 Main St	104 Main St	102,182	\$16,040	\$0.16
105 Main St	105 Main St	92,182	\$12,708	\$0.14
106 Main St	106 Main St	44,372	\$7,410	\$0.17
107 Main St	107 Main St	32,022	\$5,838	\$0.18
108 Main St	108 Main St	26,354	\$4,262	\$0.16
109 Main St	109 Main St	12,883	\$2,264	\$0.19
110 Main St	110 Main St	10,834	\$1,912	\$0.18

Table 4: Building Summary

6. Outdoor & Park Lights

- Outdoor & park lights data represents an analysis of annual energy costs, annual energy consumption (kWh) and total annual energy costs per SCE outdoor and park lighting tariff type.



Certain properties could not be matched to gas or electricity usage data and were excluded:

Address	Service Account
101 E Orangethorpe	334959
130 E Lambert Rd	50957650
1391 N Harbor Blvd	51406245
1440 E Bastanchury Rd	14195695
1470 Rolling Hills Dr	432123
1550 Parks	674248
220 Sante Fe	15243459
2451 Parks	1294336
2572 Camino del Sol	674374
2780 W Malvern Ave	1377561
631 Las Rendas Dr	432440
800 E Imperial Hwy	1377528

Certain properties did not have energy usage data for the range of the analysis period and were excluded:

Address	Service Account
1280 N Harbor Blvd	11555298
1404 N Harbor Blvd	26779867

230 Santa Fe	23571709
2825 Terraza	1377463

Endnotes

[1] Corporate Responsibility Report. (2015). In Southern California Edison. Retrieved from https://www.sce.com/wps/wcm/connect/c0fcee55-e04a-4287-8301-8e66e3e5fbac/2014_Corporate+Responsibility+Report_FINAL+single-page.pdf?MOD=AJPERES&ContentCache=NONE

[2] Adams, L.S., Nicols, M.D., Goldstene, J. N. (2008). Climate Change Scoping Plan. In California Air Resources Board. Retrieved from https://www.arb.ca.gov/cc/scopingplan/document/appendices_volume2.pdf

[3] Based on SoCalREN previous project estimates.
