

Comparative Energy Analysis Report

Prepared for
Orange County

Prepared by
The Energy Coalition

On Behalf of
The Southern California Regional Energy Network Public Agency Program

Date
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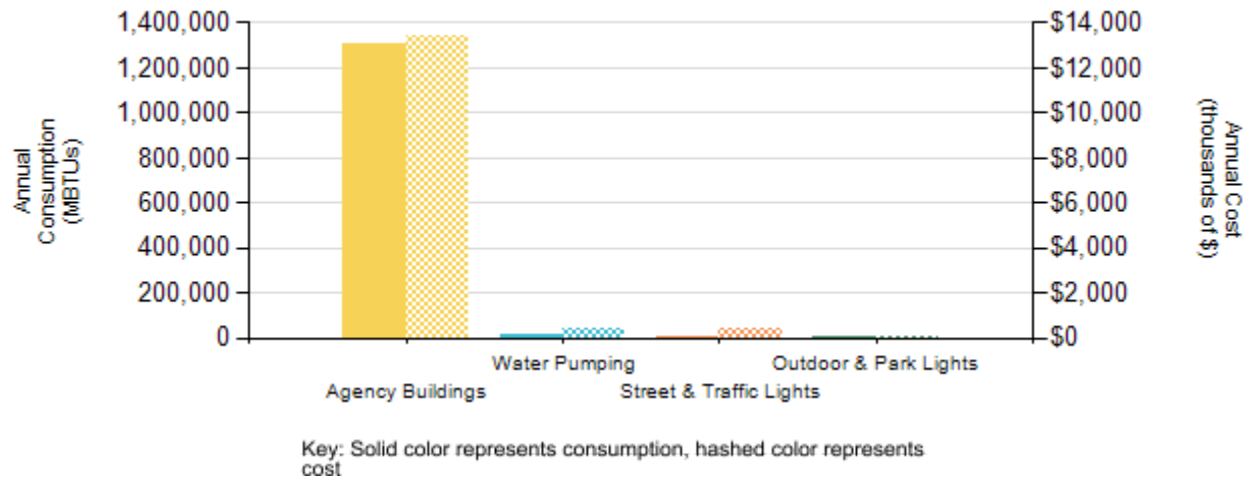
1. Overview

This report is intended to provide a framework for the County of Orange, referred to as “Agency” herein, to identify inefficient facilities and infrastructure and prioritize further investigation and energy efficiency retrofit work. This analysis uses only SCE and SCG energy billing data (the analysis does not include SDG&E 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.com). Any questions about this report can be directed to your assigned Project Manager, Jake Anderson, at janderson@energycoalition.org.

2. Total Energy Portfolio

Your Total Annual Energy Cost is **\$14,222,938**



Annual Energy Costs

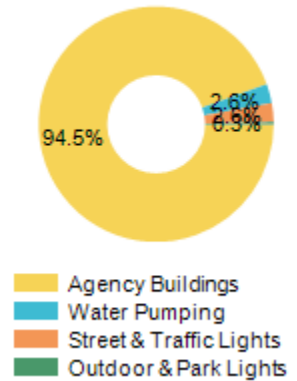


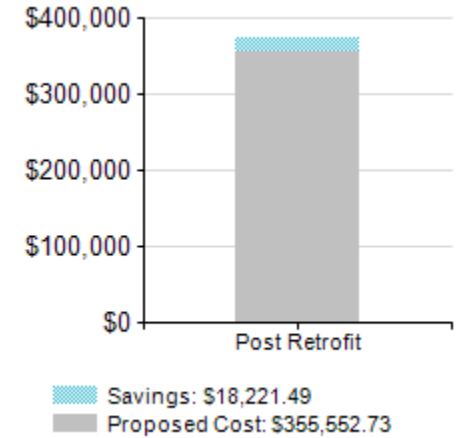
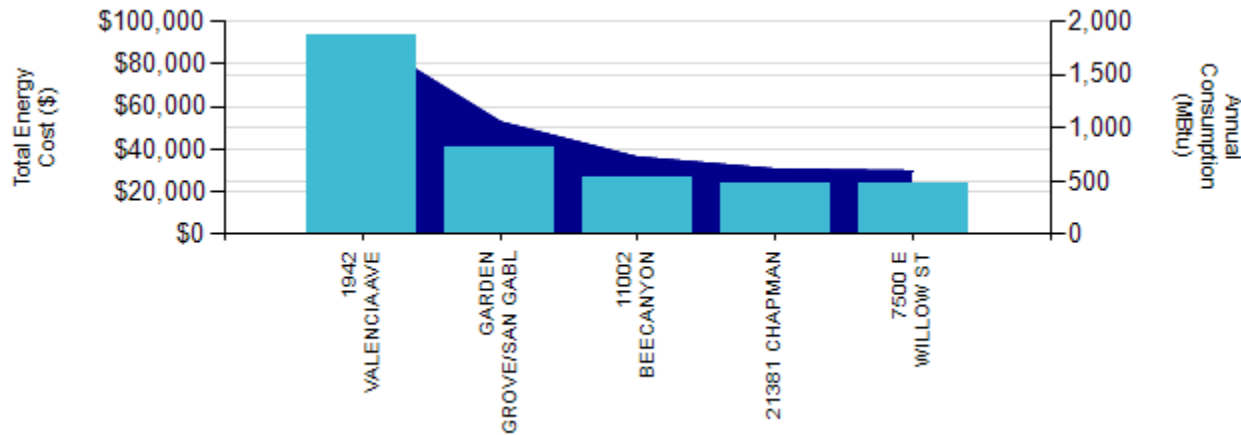
Table 1: Total Energy Portfolio (Annual)

Agency Energy Use	Electric Consumption (kWh)	Electric Cost (\$)	Gas Consumption (therms)	Gas Cost (\$)	Total Energy Consumption (MBTUs)	Total Energy Cost (\$)	GHG Emissions (lbs CO2)
Agency Buildings	85,363,014	\$12,019,600	10,109,254	\$1,417,459	1,302,013,325	\$13,437,059	44,132,678
Water Pumping	2,709,444	\$373,774	0	\$0	9,321,528	\$373,774	1,400,782
Street & Traffic Lights	1,481,871	\$368,564	0	\$0	5,053,180	\$368,564	766,127
Outdoor & Park Lights	450,642	\$43,541	0	\$0	1,536,688	\$43,541	232,982



3. Water Pumping

Your Annual Energy Cost for Water Pumping is **\$373,774** and **2.6%** of the Total Cost.

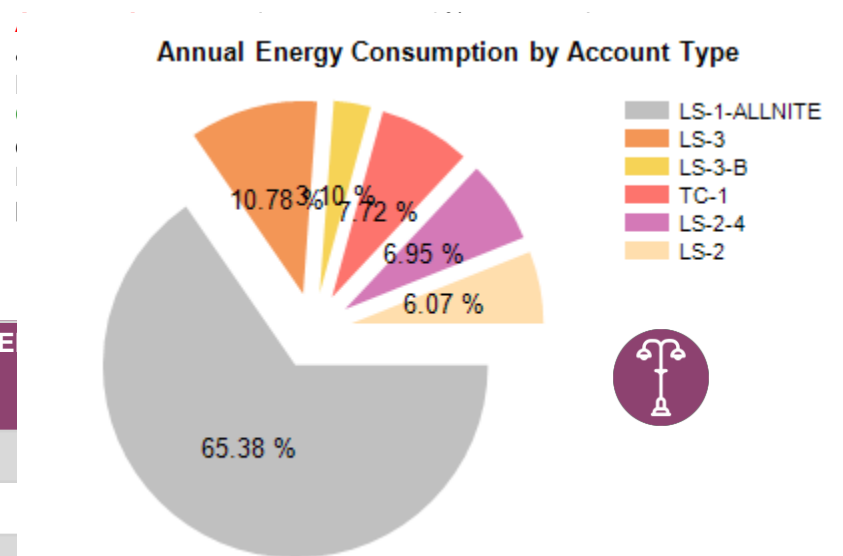


		(kWh)		(\$/kWh)
OLINDA LANDFILL	1942 VALENCIA AVE	542,723	\$93,340	\$0.17
GARDEN GROVE/SAN GABL	GARDEN GROVE/SAN GABL	308,552	\$40,575	\$0.13
FRANK BOWERMAN LANDFILL	11002 BEECANYON	212,603	\$26,746	\$0.13
21381 CHAPMAN	21381 CHAPMAN	179,495	\$23,981	\$0.13
7500 E WILLOW ST	7500 E WILLOW ST	174,640	\$23,576	\$0.14

Your Annual Energy Cost for Street & Traffic Lights is **\$368,564** and **2.6%** of the Total Cost.

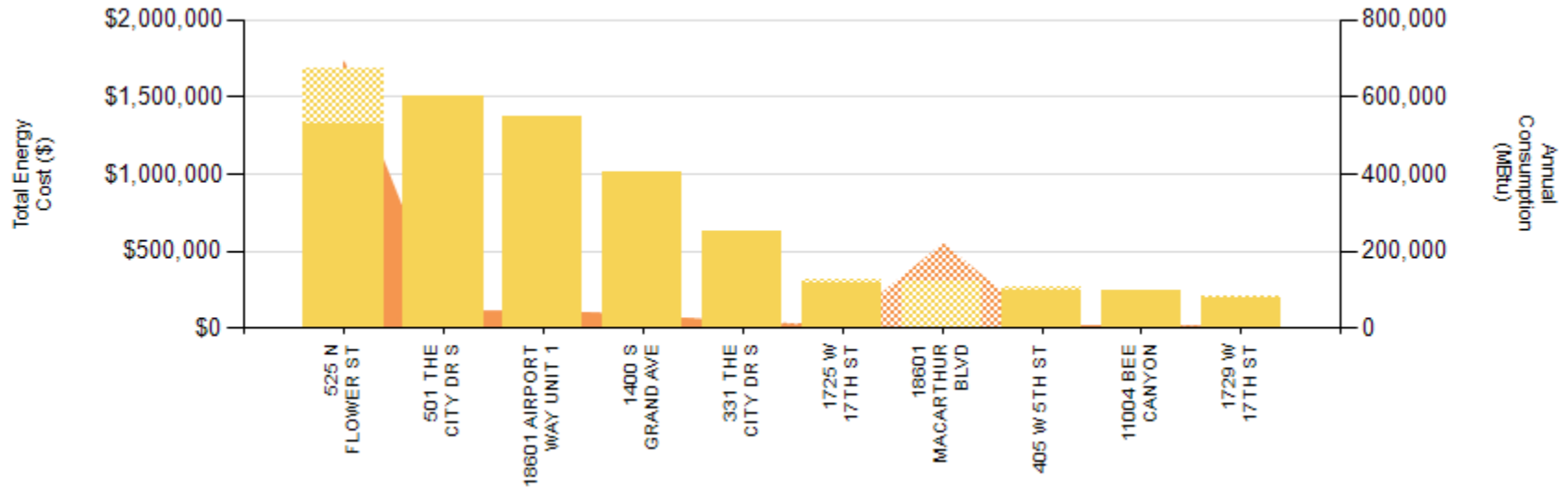
Table 3: Street & Traffic Lights (Annual)

Tariff	Tariff Description	Electric Consumption (kWh)	E		
LS-1-ALLNITE	Street Lights (SCE Owned)	968,911			
TC-1	Traffic Signal Lights (Agency Owned)	114,399			
LS-3	Street Lights (Agency Owned - metered)	159,708			
LS-2-4	Street Lights (Agency Owned - unmetered)	102,954		\$10,181	0.10
LS-2	Street Lights (Agency Owned - unmetered)	89,981		\$7,823	0.09
LS-3-B	Street Lights (Agency Owned - metered)	45,919		\$5,210	0.11





Your Annual Energy Cost for Buildings is **\$13,437,059** and **94.5%** of the Total Cost.



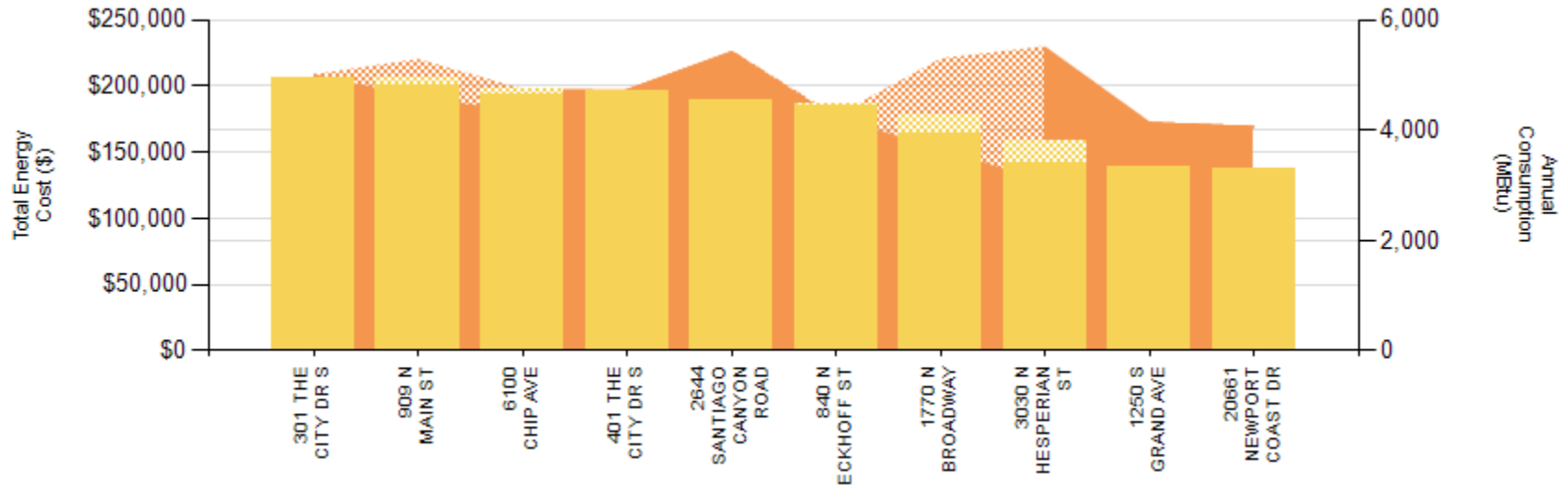
Key: Displays the top 10 consuming Buildings. Columns represent Cost, Area represents Consumption. Electricity is the solid shade, Natural Gas is the hashed shade.

Table 4: Highest Consuming Buildings (1-10)

Site Name	Address	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)	Gas Consumption (therms)	Gas Cost (\$)	Gas Rate (\$/therm)
CENTRAL UTILITY FACILITY	525 N FLOWER ST	4,426,816	\$1,320,077	\$0.30	6,762,441	\$362,556	\$0.05
THEO LACY JAIL	501 THE CITY DR S	12,321,092	\$1,499,477	\$0.12	246,179	\$138,057	\$0.56
JOHN WAYNE AIRPORT	18601 AIRPORT WAY UNIT 1	13,136,502	\$1,367,510	\$0.10	0	\$0	N/A
OC DATA CENTER	1400 S GRAND AVE	9,558,048	\$1,009,330	\$0.11	20,179	\$14,704	\$0.73
JUVENILE HALL	331 THE CITY DR S	4,325,681	\$623,331	\$0.14	39,904	\$27,861	\$0.69
17TH STREET CLINIC	1725 W 17TH ST	1,736,198	\$286,440	\$0.16	43,701	\$32,203	\$0.74
JOHN WAYNE AIRPORT CUF	18601 MACARTHUR BLVD	530	\$364	\$0.69	2,201,705	\$307,847	\$0.14
OC HEALTH CARE AGENCY	405 W 5TH ST	1,546,167	\$248,469	\$0.16	28,102	\$22,386	\$0.80
BOWERMAN LANDFILL	11004 BEE CANYON	2,042,405	\$239,166	\$0.12	0	\$0	N/A

5 Building
Summary

PUBLIC HEALTH LAB	OC	1729 W 17TH ST	1,313,674	\$198,628	\$0.15	18,368	\$13,547	\$0.74
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Key: Displays the next 10 highest consuming Buildings. Columns represent Cost, Area represents Consumption. Electricity is the solid shade, Natural Gas is the hashed shade.

Table 5: Highest Consuming Buildings (11-20)

Site Name	Address	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)	Gas Consumption (therms)	Gas Cost (\$)	Gas Rate (\$/therm)
MANCHESTER OFFICE	301 THE CITY DR S	1,466,390	\$206,761	\$0.14	11,839	\$9,035	\$0.76
COMMUNITY COURT	909 N MAIN ST	1,343,796	\$200,091	\$0.15	6,955	\$5,698	\$0.82
OC SOCIAL SERVICES	6100 CHIP AVE	1,267,943	\$193,742	\$0.15	4,117	\$3,412	\$0.83
ORANGEWOOD CTR	401 THE CITY DR S	1,386,503	\$196,051	\$0.14	14,204	\$10,701	\$0.75
EMERGENCY OPS CTR	2644 SANTIAGO CANYON	1,590,188	\$188,914	\$0.12	0	\$0	N/A
COMMUNICATIONS DIVSN	840 N ECKHOFF ST	1,237,872	\$185,805	\$0.15	342	\$497	\$1.45
HOUSING AUTHORITY	1770 N BROADWAY	1,070,122	\$164,692	\$0.15	16,408	\$12,834	\$0.78
YOUTH GUIDANCE CENTER	3030 N HESPERIAN ST	896,344	\$141,443	\$0.16	24,533	\$17,828	\$0.73
PROBATION DEPARTMENT	1250 S GRAND AVE	1,212,555	\$139,641	\$0.12	0	\$0	N/A
COYOTE CANYON LANDFILL	20661 NEWPORT COAST DR	1,191,697	\$137,522	\$0.12	0	\$0	N/A

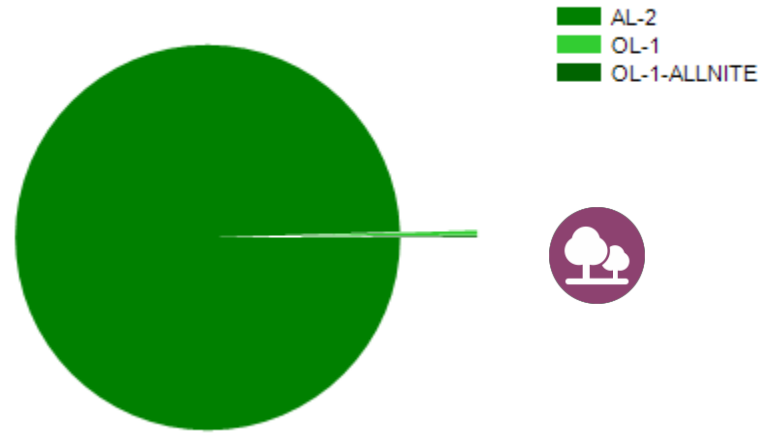


Your Annual Energy Cost for Outdoor & Park Lights is \$43,541 and 0.3% of the Total Cost.

Table 6: Outdoor & Park Lights (Annual)

Name	Address	Tariff	Electric Consumpt (kWh)
Area Lighting	101 Main St.	AL-2	448,452
Area Lighting	101 Main St.	OL-1	1,709
Area Lighting	101 Main St.	OL-1-ALLNITE	481

Annual Energy Consumption by Account Type



Appendix A - Methodology

1. Data Sources

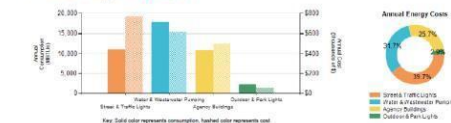
- Building information, energy usage and cost data used in this analysis were derived from utility consumption billing data provided by agency staff.
- Utility consumption billing data used in this analysis were derived from SCG gas tariffs and SCE electric tariffs (the analysis does not include SDG&E 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>
- All electricity and gas results were based on usage during period April 1, 2017 – March 31, 2018.
- 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), GHG Emissions and total annual energy costs for agency facility types based on MBtus.
- The following agency assets are included in the Total Energy Portfolio:
 - Water Pumping
 - Street & Traffic Lights
 - Buildings
 - Outdoor & Parks Lights

2. Total Energy Portfolio

Your Total Annual Energy Cost is \$1,927,408



Your Total water treatment consumption, based on wastewater cost

Agency Energy Use	Annual Electric Cost (\$)	Annual Electric Consumption (kWh)	Annual Electric Rate (\$/kWh)	Annual CO2E Emissions (lbs CO2E)
Street & Traffic Lights	\$765,894.34	3,242,353	\$0.24	1,676,542
Water & Wastewater Pumping	\$610,811.40	5,193,875	\$0.12	2,685,285
Agency Buildings	\$495,542.70	3,144,337	\$0.16	1,625,822
Outdoor & Park Lights	\$55,160.13	670,232	\$0.08	346,510

Table 1: Total Energy Portfolio

3. Water Pumping

- Water pumping data represents an analysis of the top five highest energy consuming water and wastewater pumping SCE service accounts annual energy costs, annual energy consumption (kWh), GHG Emissions, and total annual energy costs based on MBtus.
- 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].

3. Water & Wastewater Pumping

Your Annual Energy Cost for Water & Wastewater Pumping is \$610,811 and 31.7% of the Total Cost.

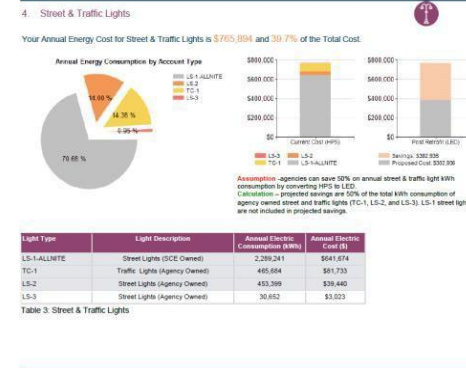


Site Name	Address	Facid	Annual Electric Consumption (kWh)	Annual Electric Cost (\$)	Annual Electric Rate (\$/kWh)
Pumping	101 Main St	TOU-PA3B	3,469,676	\$353,578	\$0.10
Pumping	101 Main St	TOU-PA2B	1,724,200	\$257,264	\$0.15

Table 2: Water & Wastewater Pumping

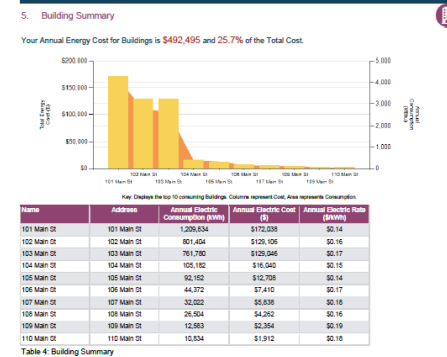
4. Street & Traffic Lights

- Street & traffic light data represents an analysis of annual energy costs, annual energy consumption (kWh), GHG Emissions 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].



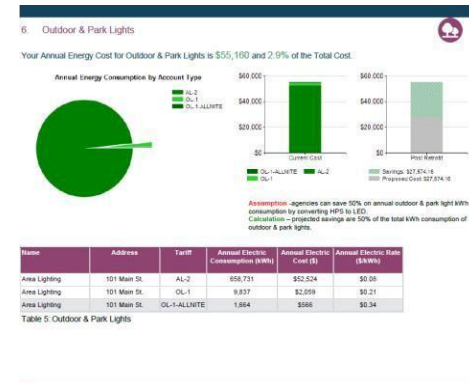
5. Building Summary

- Building summary data represents an analysis of the top ten highest energy consuming agency buildings annual energy costs, annual energy consumption (kWh), GHG Emissions, and total annual energy costs based on MBtus.



6. Outdoor & Park Lights

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



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

Tariff	Meter Number
LS-1 8784959, 8785017	
LS-2 8784979	
TC-1 11944229, 9029013	
GS	40341107, 34123760, 15621651, 8641931, 20224902, 38731015, 40340808, 8630958, 33332646, 31963970, 8634532, 35741965, 8634531, 34904506, 33542053, 8631147, 46613458, 8634619
GN-10	629086300

Endnotes

[1] Corporate Responsibility Report. (2015). In Southern California Edison. Retrieved from https://www.sce.com/wps/wcm/connect/c0fceed5-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.