



Comparative Energy Analysis Report

Prepared for
City of Irvine

Prepared by
The Energy Coalition

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

Date
8/22/2019

Table of Contents

1. Overview	1
2. Total Energy Portfolio	2
3. Water Pumping	3
4. Street & Traffic Lights	4
5. Building Summary	5
6. Outdoor & Park Lights	6
Appendix A - Methodology	7

1. Overview

This report is intended to provide a framework for the City of Irvine, 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, Andrea Antony at aanony@energycoalition.org.

2. Total Energy Portfolio

Your Total Annual Energy Cost is **\$5,287,173**

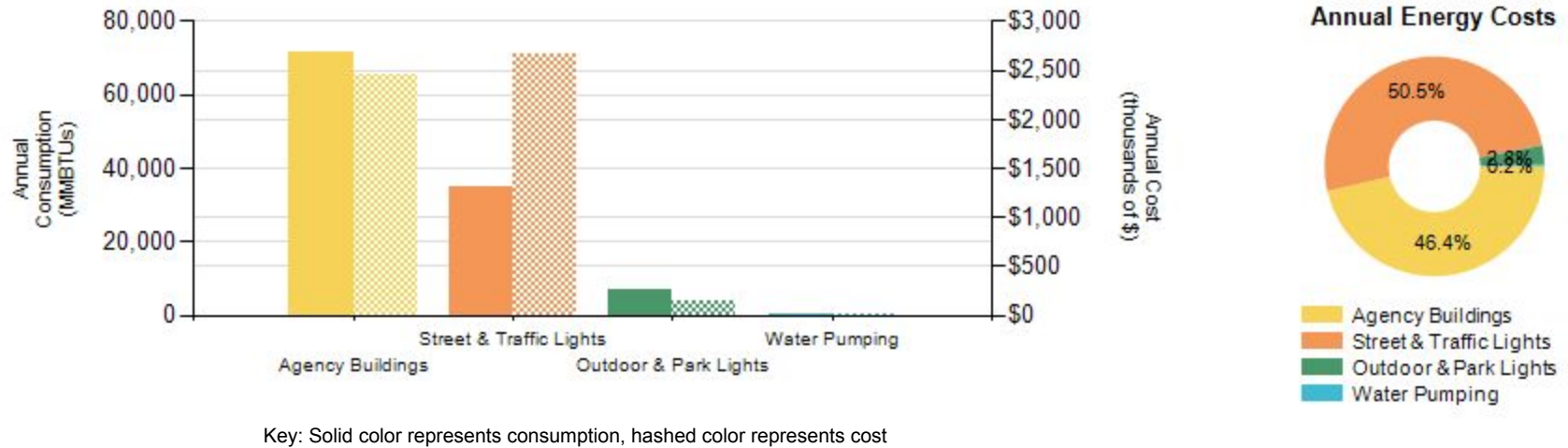


Table 1: Total Energy Portfolio (Annual)

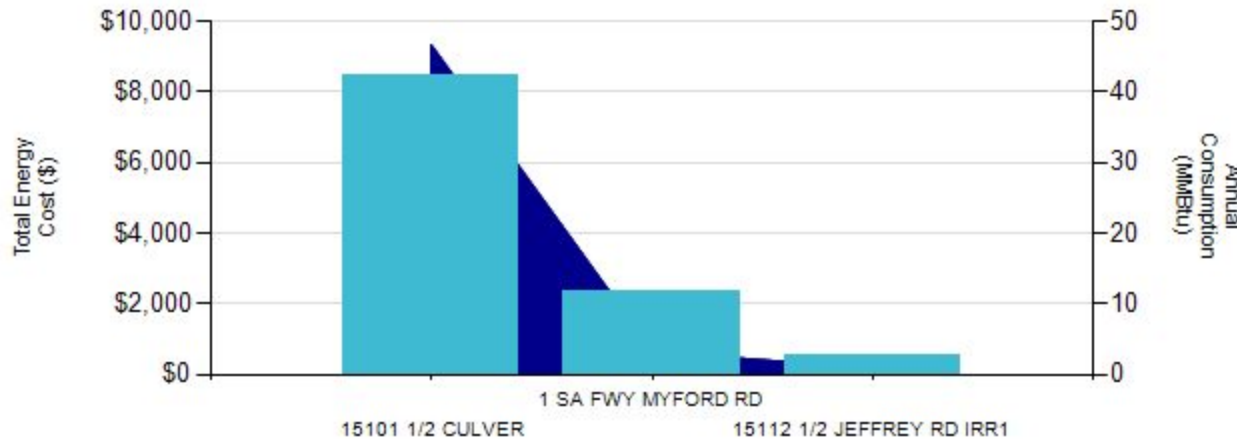
Agency Energy Use	Electric Consumption (kWh)	Electric Cost (\$)	Gas Consumption (therms)	Gas Cost (\$)	Total Energy Consumption (MMBTus)	Total Energy Cost (\$)	GHG Emissions (lbs CO2)
Street & Traffic Lights	10,194,444	\$2,672,630	0	\$0	34,763	\$2,672,630	5,270,528
Agency Buildings	13,486,792	\$2,288,608	257,935	\$163,993	71,783	\$2,452,601	6,972,672
Outdoor & Park Lights	1,975,068	\$150,611	0	\$0	6,735	\$150,611	1,021,110
Water Pumping	14,901	\$11,332	0	\$0	51	\$11,332	7,704



3. Water Pumping



Your Annual Energy Cost for Water Pumping is **\$11,332** and **0.2%** 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)
15101 1/2 CULVER	15101 1/2 CULVER	13,685	\$8,457	\$0.62
1 SA FWY MYFORD RD	1 SA FWY MYFORD RD	954	\$2,340	\$2.45

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

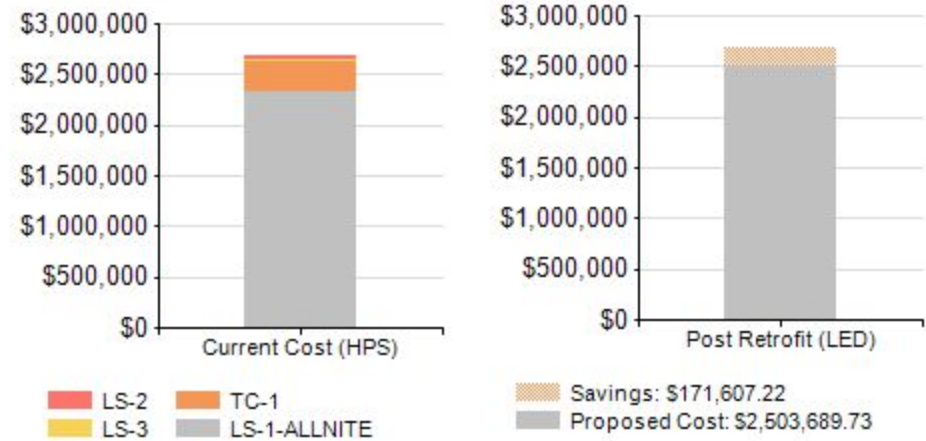
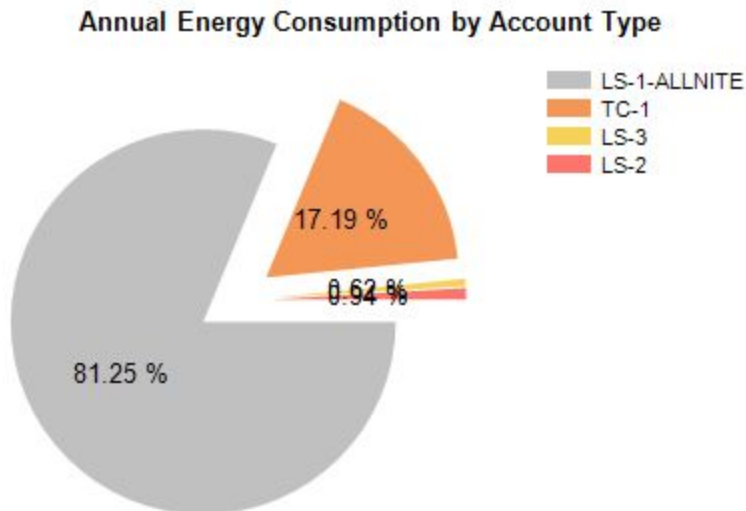
Calculation - projected savings are 7.5% of 65% of the total PA consumption (for ALL pump accounts)

15112 1/2 JEFFREY RD IRR1	15112 1/2 JEFFREY RD IRR1	262	\$535	\$2.04
------------------------------	---------------------------	-----	-------	--------

4. Street & Traffic Lights



Your Annual Energy Cost for Street & Traffic Lights is **\$2,672,630** and **50.5%** 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)

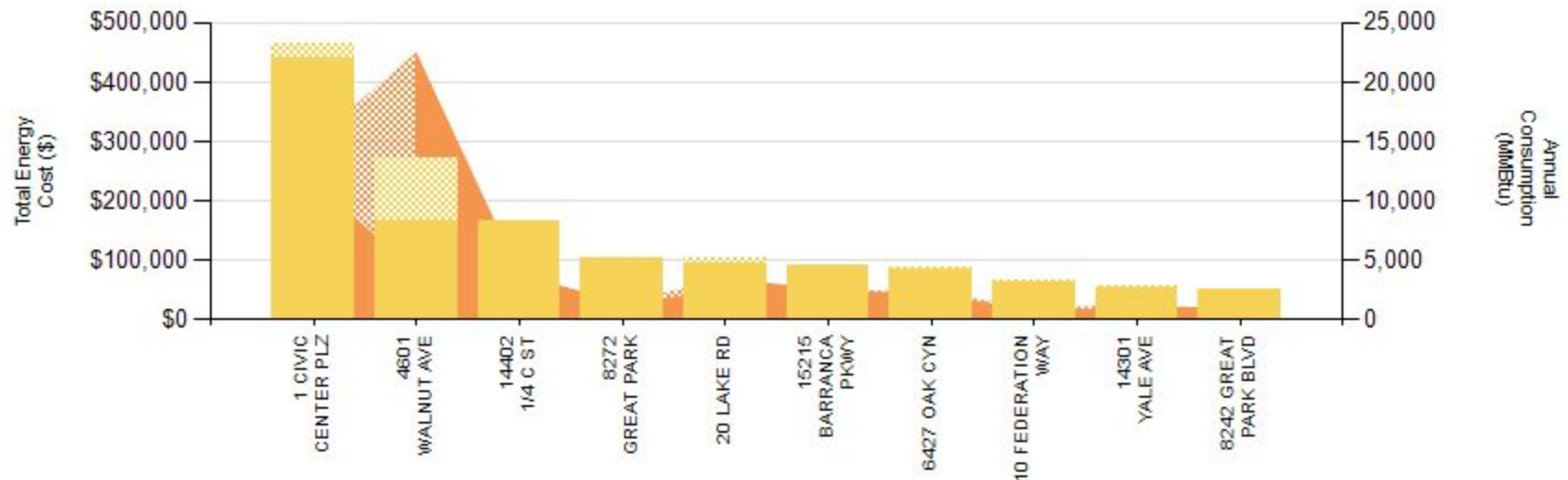
Tariff	Tariff Description	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)
LS-1-ALLNITE	Street Lights (SCE Owned)	8,202,593	\$2,332,083	0.28

TC-1	Traffic Signal Lights (Agency Owned)	1,734,874	\$313,820	0.18
LS-2	Street Lights (Agency Owned - unmetered)	94,851	\$22,680	0.24
LS-3	Street Lights (Agency Owned - metered)	62,955	\$6,714	0.11

5. Building Summary



Your Annual Energy Cost for Buildings is **\$2,452,601** and **46.4%** of the Total Cost.



Key: Displays the top 10 consuming Buildings. Yellow columns represent Cost, Orange area represents Consumption. Electricity is the solid shade, Natural Gas is the hashed shade.

Table 4: Building Summary (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)	Gas Consumption (therms)	Gas Cost (\$)	Gas Rate (\$/therm)
IRVINE CIVIC CENTER	1 CIVIC CENTER PLZ	3,397,516	\$438,959	\$0.13	34,723	\$24,570	\$0.71

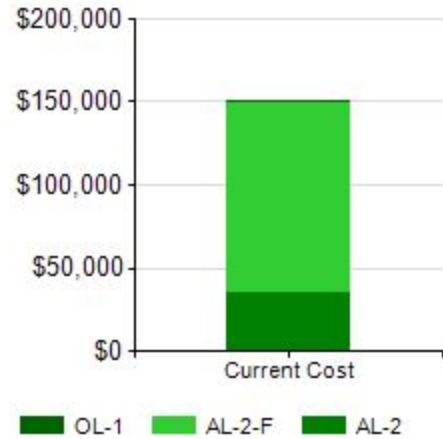
WOOLLETT AQUATICS CENTER	4601 WALNUT AVE	1,172,640	\$166,163	\$0.14	184,174	\$106,232	\$0.58
IRVINE GREAT PARK	14402 1/4 C ST	1,075,792	\$164,596	\$0.15	0	\$0	\$0.00
OC SOCCER CLUB	8272 GREAT PARK	412,092	\$104,342	\$0.25	0	\$0	\$0.00
LAKEVIEW SENIOR CENTER	20 LAKE RD	684,186	\$94,076	\$0.14	10,865	\$8,485	\$0.78
IRVINE METROLINK STATION	15215 BARRANCA PKWY	738,185	\$90,575	\$0.12	0	\$0	\$0.00
OAK CREEK GOLF CLUB	6427 OAK CYN	606,883	\$86,056	\$0.14	2,132	\$2,170	\$1.02
LOS LOMAS COMMUNITY PARK	10 FEDERATION WAY	239,319	\$66,028	\$0.28	1,600	\$1,761	\$1.10
HERITAGE PARK COMMUNITY CENTER	14301 YALE AVE	268,336	\$53,449	\$0.20	2,834	\$2,159	\$0.76
GREAT PARK TENNIS PARKING LOT	8242 GREAT PARK BLVD	249,574	\$50,064	\$0.20	0	\$0	\$0.00

6. Outdoor & Park Lights



Your Annual Energy Cost for Outdoor & Park Lights is **\$150,611** and **2.8%** of the Total Cost.

Annual Energy Consumption by Account Type



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	1,533,988	\$114,198	\$0.07
Area Lighting	Various	AL-2	439,016	\$35,637	\$0.08
Area Lighting	Various	OL-1	2,064	\$776	\$0.38

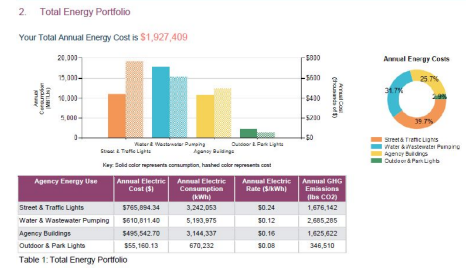
Appendix A - Methodology

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 April 1, 2018 – March 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].

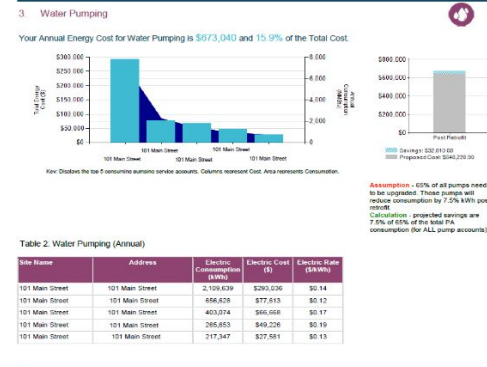
2. Total Energy Portfolio

- 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



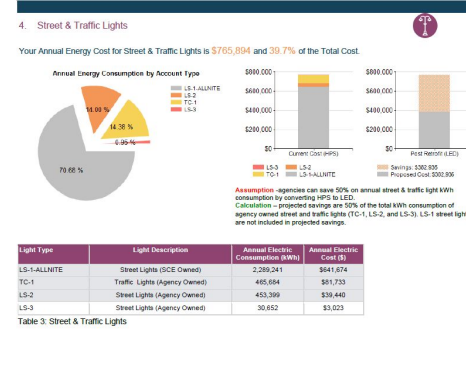
3. Water Pumping

- 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].



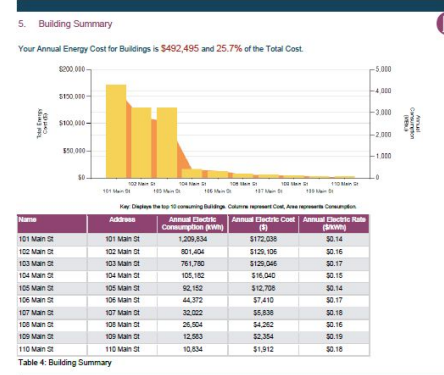
4. Street & Traffic Lights

- 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].



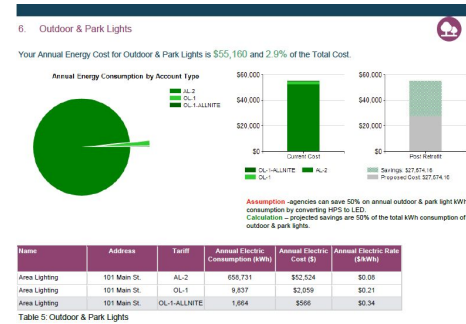
5. Building Summary

- 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).



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

- Electric
 - 7451 ¼ Marina Way – Service Account #48771772
 - 8412 Great Park Blvd – Service Account #48771828

Endnotes

[1] Corporate Responsibility Report. (2015). In Southern California Edison. Retrieved from https://www.sce.com/wps/wcm/connect/c0fcee5-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.
