Comparative Energy Analysis Report

Comparative Energy Analysis

Prepared for

The City of Huntington Beach

Prepared by

The Energy Coalition on behalf of the
Southern California Regional Energy Network (SoCalREN)

Date

05/08/2018

Southern California
REGIONAL ENERGY NETWORK

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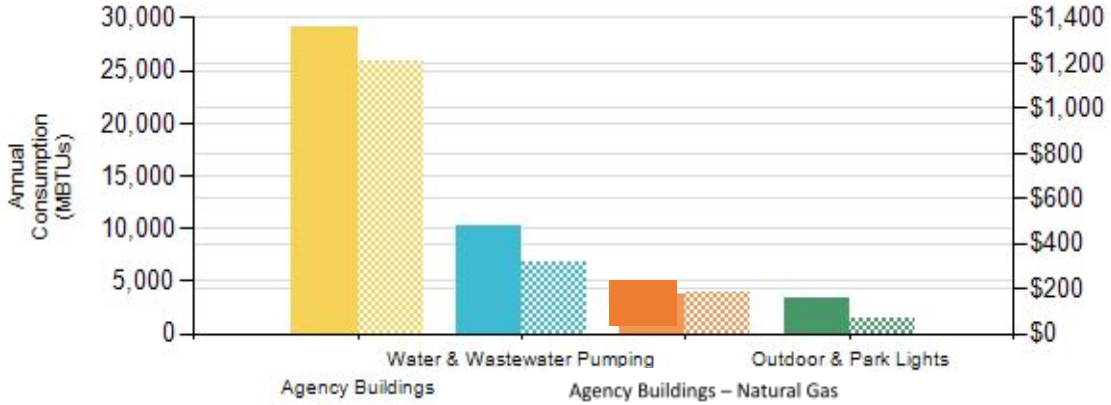
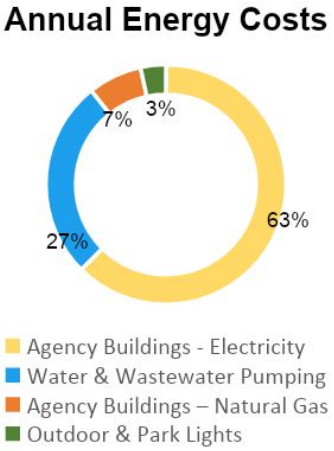
1. Overview

This report is intended to provide a framework for the City of Huntington Beach, referred to as “Agency” herein, to identify inefficient facilities and prioritize further investigation and energy efficiency retrofit work. This analysis uses only electric and gas energy billing data provided by the Agency to provide an overview of energy use in Agency 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 (HVAC), 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. Total Energy Portfolio

Your Total Annual Energy Cost is $1,927,353*.





Key: Solid color represents consumption, hashed color represents cost

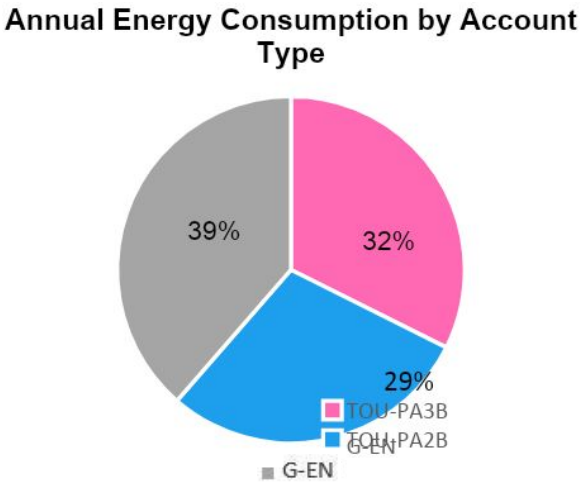
Agency Energy Use	Annual Cost ($)	Annual Electric Consumption (kWh)	Annual Natural Gas Consumption (Therms)	Annual Electric and Natural Gas Rate	Annual GHG Emissions (lbs CO2)
Agency Buildings - Electricity	$1,203,819	8,542,157	-	$0.14	4,416,295
Agency Buildings – Natural Gas	$140,169	-	173,116	$0.91	2,061,811
Water & Wastewater Pumping	$517,568	2,980,643	314,328	$0.27	5,284,638
Outdoor & Park Lights	$65,796	960,780	-	$0.07	496,723

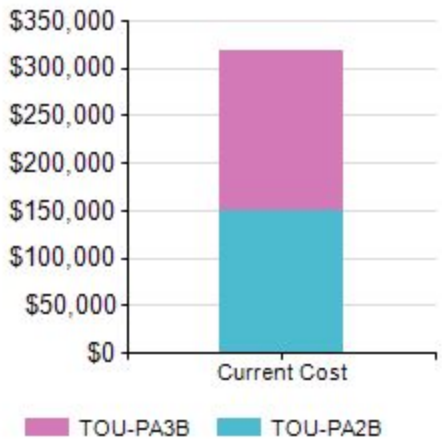
Table 1: Total Energy Portfolio

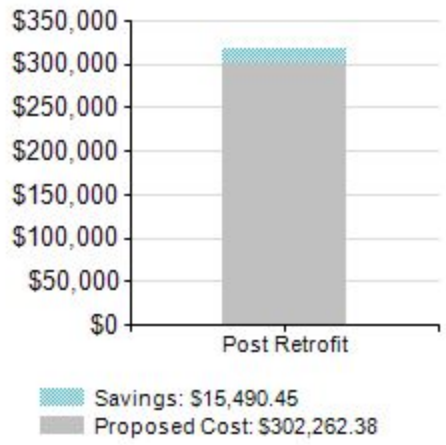
*Please note: LS-1, LS-2, and LS-3 meters and data are not included in this analysis, as the most recent street light usage data does not account for the LS-1 street light upgrades.
*An average blended rate is taken for water & wastewater pumping accounts.

3. Pumping

Your Annual Energy Cost for Water & Wastewater Pumping is $517,568.







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 pumping account consumption (for ALL pump accounts)
Please note: Assumptions and calculations do not include consumption data from natural gas.

Site Name	Address	Tariff	Annual Electric Consumption (kWh)	Annual Natural Gas Consumption (Therms)	Annual Cost ($)	Annual Electric Rate ($/kWh)	Annual Rate ($/Therm)*

Pumping	Various	TOU-PA3 B	1,636,955	-	$167,621	$0.10	
Pumping	Various	TOU-PA2 B	1,343,688	-	$150,131	$0.11	
Pumping – Natural Gas	Various	G-EN	-	314,328	$199,816	-	$.62

Table 2: Water & Wastewater Pumping

*Please note: annual rate for Pumping – Natural Gas determined by dividing annual cost by the annual consumption.

4. Building Summary - Electricity

Your Annual Energy Cost for Buildings is $1,203,819.

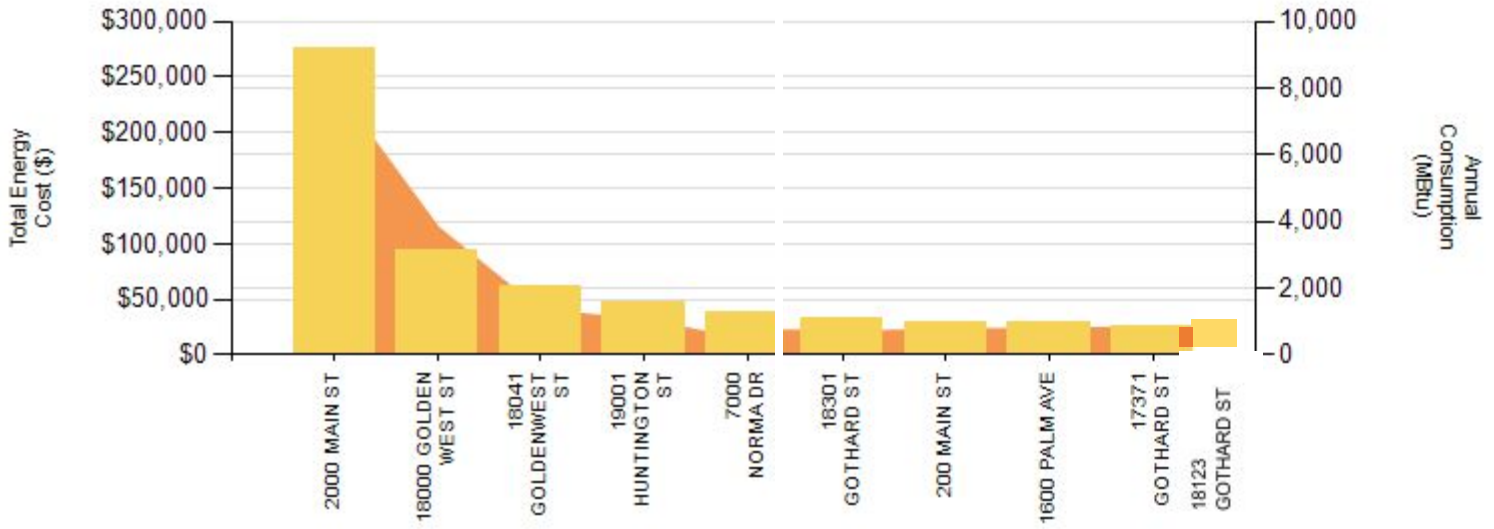


Table 3: Building Summary

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

Name	Address	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
Civic Center / Police Department	2000 MAIN ST	2,374,112	$276,584	$0.12
Central Library	18000 GOLDEN WEST ST	1,348,433	$130,678	$0.12
Senior Center	18041 GOLDENWEST ST	397,511	$62,608	$0.16
City Water Operations Facility	19001 HUNTINGTON ST	309,307	$47,448	$0.15
Murdy Park & Community Ctr	7000 NORMA DR	131,090	$37,610	$0.29
JPTC Operations Center	18301 GOTHARD ST	209,973	$32,609	$0.16
Main Promenade Parking	200 MAIN ST	217,547	$30,130	$0.14
City Gym and Pool	1600 PALM AVE	240,343	$29,250	$0.12
Corporate Yard Building	17371 GOTHARD ST	235,508	$26,612	$0.11
Central Park Sports Complex	18123 GOTHARD ST	163,169	$26,377	$0.15

5. Building Summary – Natural Gas

Your Annual Natural Gas Cost for Buildings is $140,169.

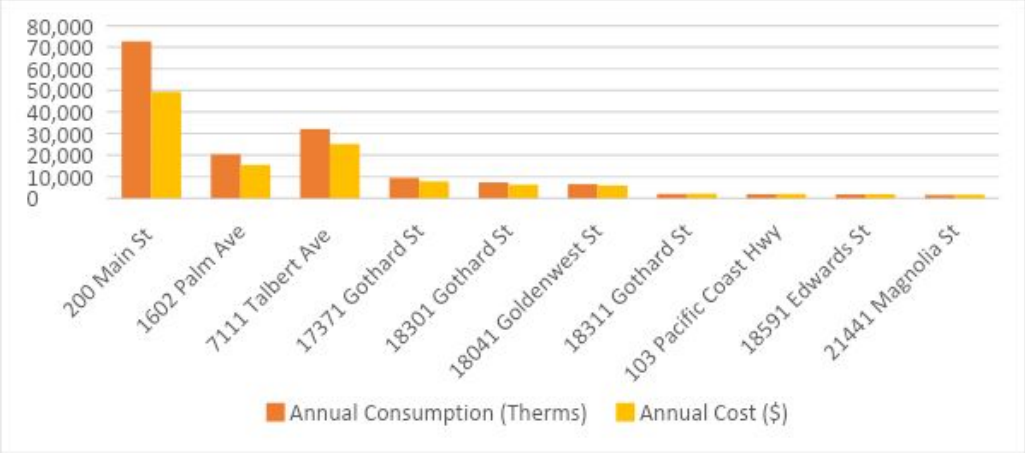


Table 4: Building Summary

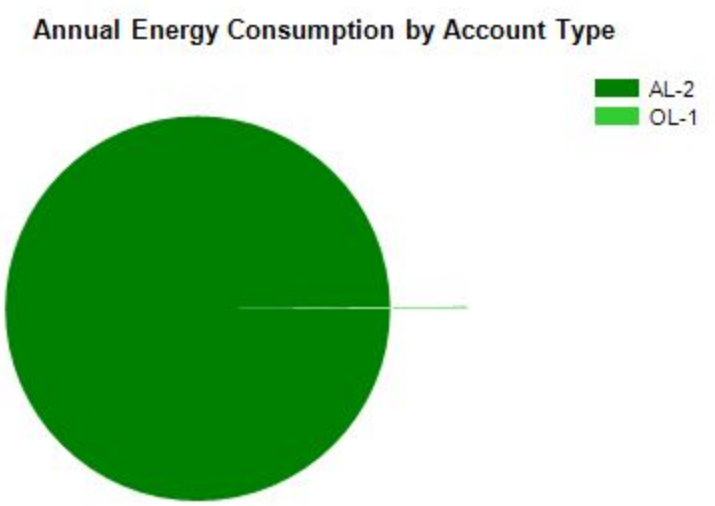
Key: Displays the top 10 consuming Buildings Columns represent Cost, Area represents Consumption.

Name	Address	Annual Consumption (Therms)	Annual Gas Cost ($)	Annual Gas Rate ($/therm)*
Civic Center / Police Department	2000 Main St	72,800	$49,303	$0.68
City Gym and Pool	1602 Palm Ave	20,397	$15,462	$0.76
Central Library	7111 Talbert Ave	32,111	$25,166	$0.78
Corporate Yard Building	17371 Gothard St	9,453	$7,825	$0.83
JPTC Operations Center	18301 Gothard St	7,369	$6,283	$0.85
Senior Center	18041 Goldenwest St	6,532	$5,906	$0.90
Gothard Fire Station #1	18311 Gothard St	2,015	$2,120	$1.05
Lifeguard Headquarters	103 Pacific Coast Hwy	1,879	$1,992	$1.06
Edwards Fire Station #6	18591 Edwards St	1,794	$1,915	$1.07
Magnolia Fire Station #4	21441 Magnolia St	1,519	$1,675	$1.10

*Please note: annual gas rate determined by dividing annual cost by the annual consumption.

6. Outdoor & Park Lights

Your Annual Energy Cost for Outdoor & Park Lights is $65,796.



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.

Name	Address	Tariff	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
Area Lighting	Various	AL-2	959,400	$65,235	$0.07
Area Lighting	Various	OL-1	1,380	$561	$0.41

Table 5: Outdoor & Park Lights

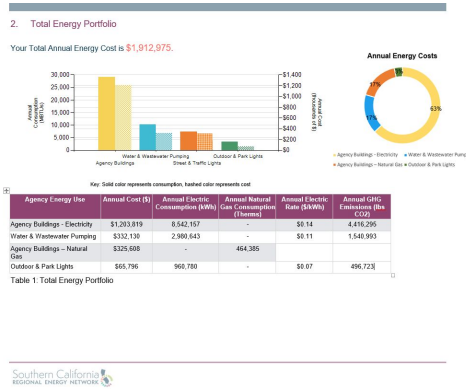
Appendix A - Methodology

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
    - SCE Electric Tariff: For more information about Southern California Edison tariffs; https://www.sce.com/wps/portal/home/regulatory/tariff-books/rates-pricing-choices
- All electricity and gas results were based on usage during period January 1, 2017 – December 31, 2017.
- 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 aggregated by summing the average daily 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 electric cost, annual electric 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 and Wastewater Pumping
  - Buildings
  - Outdoor & Parks Lights



2. Total Energy Portfolio

Your Total Annual Energy Cost is $1,912,975.

Annual Energy Costs

Key: Solid color represents consumption, hashed color represents cost

Agency Energy Use	Annual Cost ($)	Annual Electric Consumption (kWh)	Annual Natural Gas Consumption (Therms)	Annual Electric Rate ($/kWh)	Annual GHG Emissions (lbs CO2)
Agency Buildings - Electricity	$1,203,819	8,542,157	-	$0.14	4,416,296
Water & Wastewater Pumping	$332,130	2,980,643	-	$0.11	1,540,993
Agency Buildings – Natural Gas	$325,688	-	464,385		
Outdoor & Park Lights	$65,796	960,780	-	$0.07	496,723

Table 1: Total Energy Portfolio

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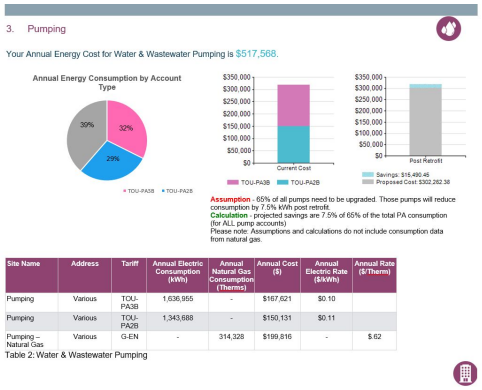
3. Water & Wastewater Pumping

- Water and wastewater data represents an analysis of the top five highest energy consuming water and wastewater pumping SCE and SCG service accounts annual energy costs, annual electric cost, 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. Pumping

Your Annual Energy Cost for Water & Wastewater Pumping is $517,568.

Annual Energy Consumption by Account Type

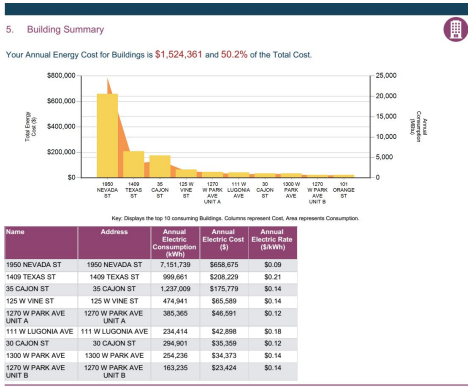
Assumption - 65% of all pumps need to be upgraded. Those pumps will reduce consumption by 7.5% kWh post retrofit.
Calculation - projected savings are 7.5% of 65% of the total PA consumption (for ALL pump accounts)
Please note: Assumptions and calculations do not include consumption data from natural gas.

Site Name	Address	Tariff	Annual Electric Consumption (kWh)	Annual Natural Gas Consumption (Therms)	Annual Cost ($)	Annual Electric Rate ($/kWh)	Annual Rate ($/Therm)
Pumping	Various	TOU-PA3B	1,636,955	-	$167,621	$0.10	
Pumping	Various	TOU-PA2B	1,343,688	-	$150,131	$0.11	
Pumping – Natural Gas	Various	G-EN	-	314,328	$199,816	-	$.62

Table 2: Water & Wastewater Pumping

4. Building Summary – Electricity

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



5. Building Summary

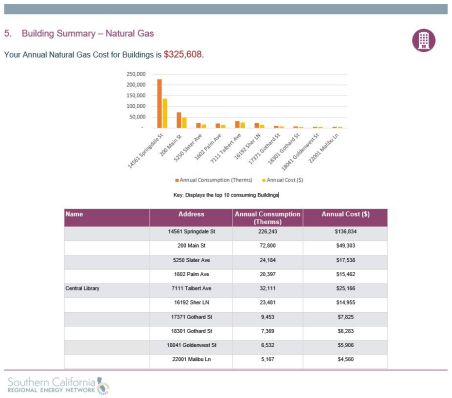
Your Annual Energy Cost for Buildings is $1,524,361 and 50.2% of the Total Cost.

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

Name	Address	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
1950 NEVADA ST	1950 NEVADA ST	7,151,739	$658,675	$0.09
1409 TEXAS ST	1409 TEXAS ST	999,661	$208,229	$0.21
35 CAJON ST	35 CAJON ST	1,237,009	$175,779	$0.14
125 W VINE ST	125 W VINE ST	474,941	$65,589	$0.14
1270 W PARK AVE UNIT A	1270 W PARK AVE UNIT A	385,365	$46,591	$0.12
111 W LUGONIA AVE	111 W LUGONIA AVE	234,414	$42,898	$0.18
30 CAJON ST	30 CAJON ST	294,901	$35,359	$0.12
1300 W PARK AVE	1300 W PARK AVE	254,236	$34,373	$0.14
1270 W PARK AVE UNIT B	1270 W PARK AVE UNIT B	163,235	$23,424	$0.14

5. Building Summary – Natural Gas

- Building summary data represents an analysis of the top ten highest natural gas consuming agency buildings annual costs, annual consumption (Btu) and total annual energy costs.



5. Building Summary – Natural Gas

Your Annual Natural Gas Cost for Buildings is $325,608.

Key: Displays the top 10 consuming Buildings

Name	Address	Annual Consumption (Therms)	Annual Cost ($)
	14561 Springdale St	226,243	$136,634
	280 Main St	72,800	$49,393
	5256 Slater Ave	24,164	$17,538
	1662 Palm Ave	20,397	$15,462
Central Library	7111 Talbert Ave	32,111	$25,166
	16192 Sher LN	23,481	$14,955
	17371 Gothard St	9,453	$7,625
	16301 Gothard St	7,369	$6,263
	16041 Goldenwest St	6,532	$5,906
	22001 Malibu Ln	5,167	$4,560

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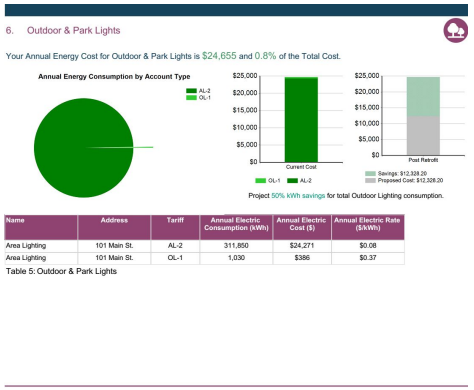
6. Outdoor & Park Lights

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


6. Outdoor & Park Lights

Your Annual Energy Cost for Outdoor & Park Lights is $24,655 and 0.8% of the Total Cost.

Annual Energy Consumption by Account Type

AL-2
OL-1

$25,000
$20,000
$15,000
$10,000
$5,000
$0

Current Cost

Post Retrofit

OL-1 AL-2

Savings: $12,338.20
Proposed Cost: $12,326.20

Project 50% kWh savings for total Outdoor Lighting consumption.

Name	Address	Tariff	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
Area Lighting	101 Main St.	AL-2	311,850	$24,271	$0.08
Area Lighting	101 Main St.	OL-1	1,030	$386	$0.37

Table 5: Outdoor & Park Lights

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

Tariff Type	Meter Number
LS-1, LS-2, LS-3	All meters and data are excluded from the analysis
Traffic Control	1376174, 1033170, 1376128, 1375997, 1375996
Pumping	1376027, 1375953, 1376031, 1376030, 25686367
Area Lighting	1375939

Endnotes

[1] Corporate Responsability Report. (2015). In Southern California Edison. Retrived from https://www.sce.com/wps/wcm/connect/c0fceef5-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. Retrived from https://www.arb.ca.gov/cc/scopingplan/document/appendices_volume2.pdf

[3] Based on SoCalREN previous project estimates.