Comparative Energy Analysis Report

Prepared for

Monrovia

Prepared by

The Energy Coalition

On Behalf of

The Southern California Regional Energy Network Public Agency Project Delivery Programs

Date

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Southern California
REGIONAL ENERGY NETWORK

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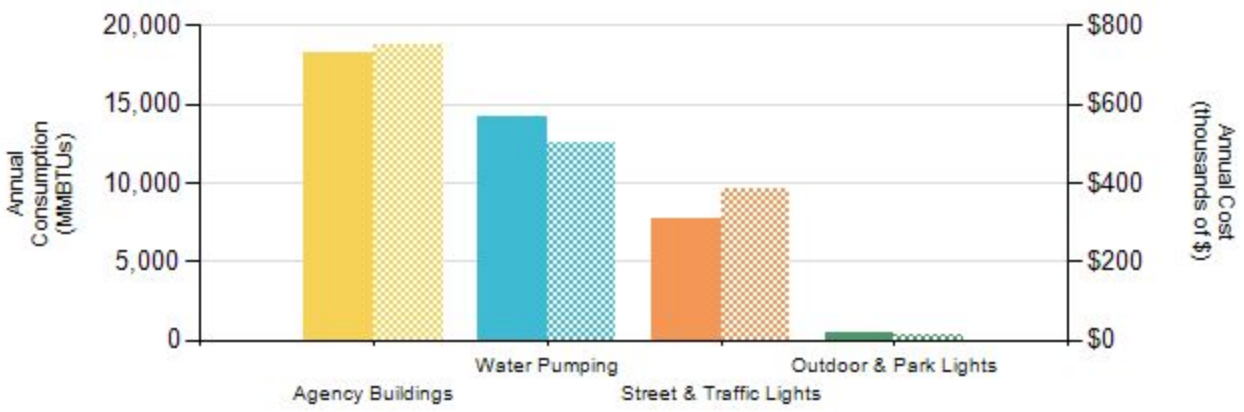
1. Overview

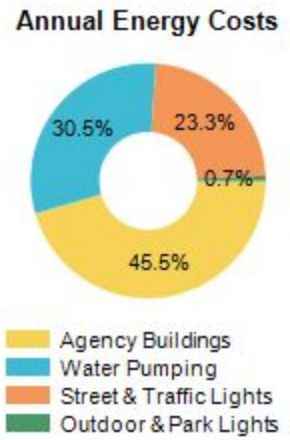
This report is intended to provide a framework for the Monrovia, referred to as “Agency” herein, to identify inefficient facilities and infrastructure and prioritize further investigation and energy efficiency retrofit work. This analysis uses only energy billing data provided by the Agency to analyze 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, Vanessa Lopez at vlopez@energycoalition.org.

2. Total Energy Portfolio

Your Total Annual Energy Cost is $1,646,898





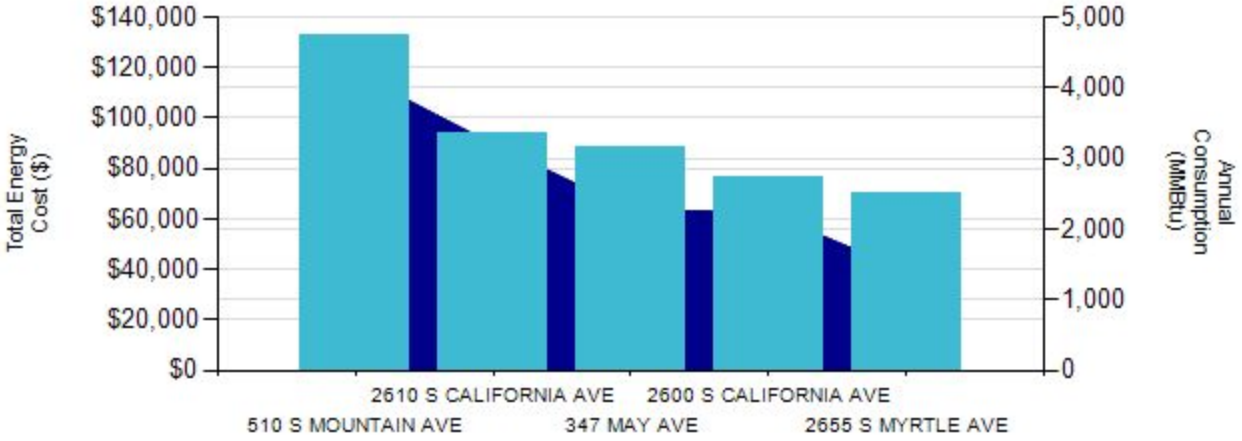
Key: Solid color represents consumption, hashed color represents cost

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)
Agency Buildings	4,983,026	$736,314	12,747	$13,562	18,267	$749,875	2,576,224
Water Pumping	4,152,762	$502,469	0	$0	14,161	$502,469	2,146,978
Street & Traffic Lights	2,247,286	$383,008	0	$0	7,663	$383,008	1,161,847
Outdoor & Park Lights	146,958	$11,546	0	$0	501	$11,546	75,977

3. Water Pumping

Your Annual Energy Cost for Water Pumping is $502,469 and 30.5% of the Total Cost.



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

Table 2: Water Pumping (Annual)

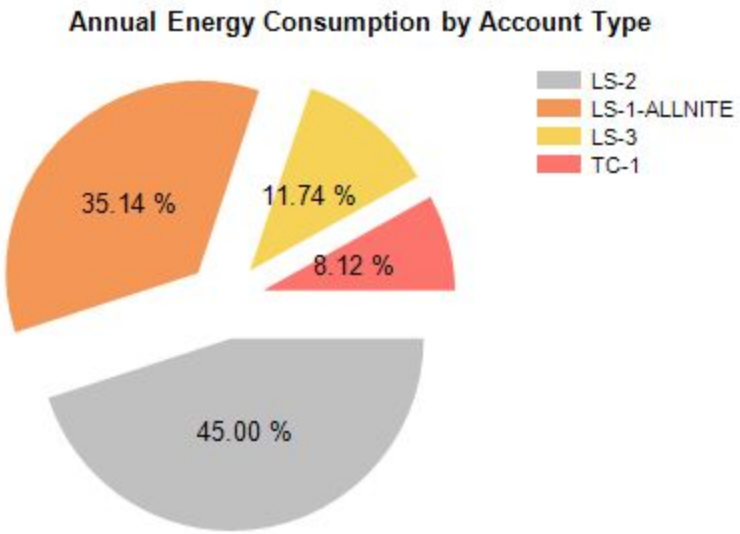
Site Name	Address	Electric Consumption (kWh)	Electric Cost ($)	Electric Rate ($/kWh)
510 S MOUNTAIN AVE	510 S MOUNTAIN AVE	1,231,961	$132,682	$0.11
2610 S CALIFORNIA AVE	2610 S CALIFORNIA AVE	935,391	$93,820	$0.10
347 MAY AVE	347 MAY AVE	667,087	$88,322	$0.13
2600 S CALIFORNIA AVE	2600 S CALIFORNIA AVE	653,776	$76,949	$0.12

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)

2655 S MYRTLE AVE	2655 S MYRTLE AVE	410,258	$70,585	$0.17

4. Street & Traffic Lights

Your Annual Energy Cost for Street & Traffic Lights is $383,008 and 23.3% 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.

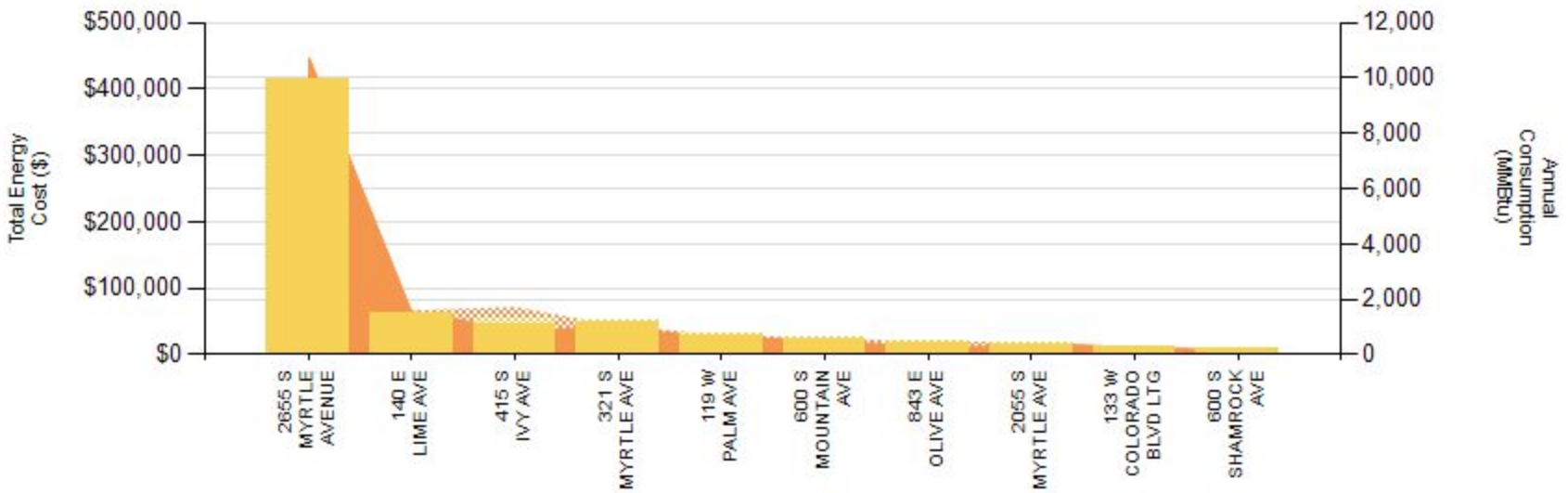
Table 3: Street & Traffic Lights (Annual)

Tariff	Tariff Description	Electric Consumption (kWh)	Electric Cost ($)	Electric Rate ($/kWh)
LS-1-ALLNITE	Street Lights (SCE Owned)	789,673	$236,270	0.30

LS-2	Street Lights (Agency Owned - unmetered)	1,011,276	$91,526	0.09
TC-1	Traffic Signal Lights (Agency Owned)	182,543	$32,129	0.18
LS-3	Street Lights (Agency Owned - metered)	263,794	$23,083	0.09

5. Building Summary

Your Annual Energy Cost for Buildings is $749,875 and 45.5% of the Total Cost.



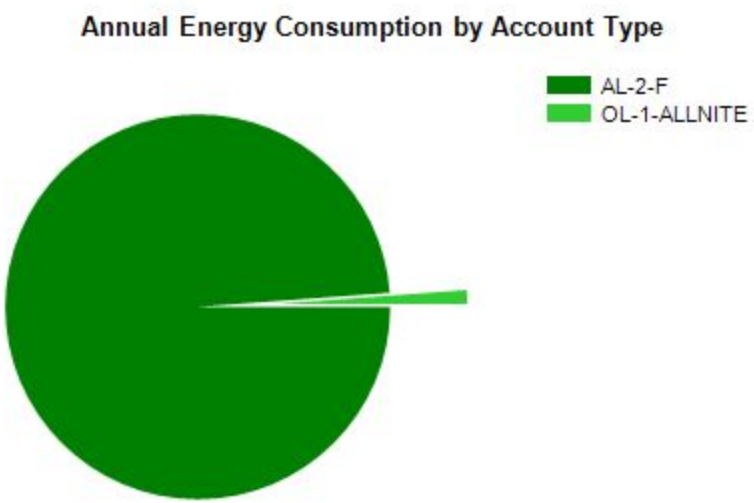
Key: Displays the top 10 consuming Buildings. Yellow columns represent Cost, Orange area represents Consumption. Electricity is the solid shade, Natural Gas is the hashed shade.

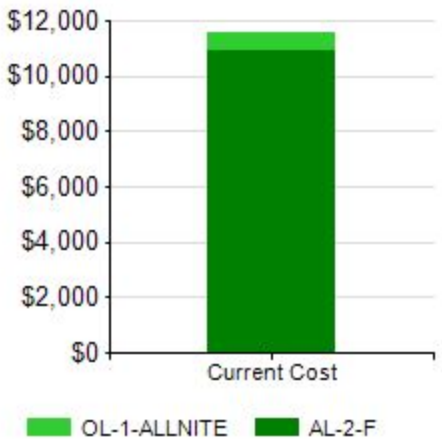
Table 4: Building Summary (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost ($)	Electric Rate ($/kWh)	Gas Consumption (therms)	Gas Cost ($)	Gas Rate ($/therm)	Disadvantaged Community (YES or NO)
WELLS & TREATMENT	2655 S MYRTLE AVE	3,140,199	$416,390	$0.13	0	$0	$0.00	YES
POLICE DEPARTMENT	140 E LIME AVE	459,461	$62,625	$0.14	0	$0	$0.00	YES
CITY HALL- MONROVIA	415 S IVY AVE	262,099	$45,763	$0.17	8,057	$7,532	$0.93	YES
MONROVIA PUBLIC LIB	321 S MYRTLE AVE	286,019	$50,826	$0.18	312	$508	$1.63	YES
COMMUNITY CENTER	119 W PALM AVE	178,335	$31,333	$0.18	856	$1,149	$1.34	YES
PUBLIC WORKS	600 S MOUNTAIN AVE	156,786	$25,807	$0.16	442	$727	$1.64	YES
MARY WILCOX YOUTH CTR	843 E OLIVE AVE	75,015	$17,508	$0.23	1,766	$2,071	$1.17	YES
FIRE STATION	2055 S MYRTLE AVE	92,906	$15,803	$0.17	1,313	$1,574	$1.20	YES
133 W COLORADO BLVD LTG	133 W COLORADO BLVD LTG	74,980	$11,487	$0.15	0	$0	$0.00	YES
BOYS & GIRLS CLUB	600 S SHAMROCK AVE	42,238	$10,796	$0.26	0	$0	$0.00	YES

6. Outdoor & Park Lights

Your Annual Energy Cost for Outdoor & Park Lights is $11,546 and 0.7% 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 ($)	Electric Rat ($/kWh)
Area Lighting	Various	AL-2-F	145,242	$10,892	$0.07

Area Lighting	Various	OL-1-ALLNITE	1,716	$655	$0.38

Appendix A - Annual Comparison

Key: Displays Buildings with the top 10 absolute change in MMBtu from baseline period to analysis period. Electricity is the solid yellow shade, Natural Gas is the hashed yellow shade.

Table 6: Annual Comparison

Site Name	Address	Prior Year Electric Consumption (kWh)	Current Year Electric Consumption (kWh)	Annual Change in Electricity	Prior Year Gas Consumption (therms)	Current Year Gas Consumption (therms)	Annual Change in Gas	Annual Change in Energy MMBtus
WELLS &TREATMENT	2655 S MYRTLE AVE	3,240,656	3,140,199	-3.1%	-	-	0.0%	-3.1%
MARY WILCOX YOUTH CENTER	843 E OLIVE AVE	107,191	75,015	-30.0%	3,823	1,766	-53.8%	-42.2%
MONROVIA PUBLIC LIBRARY	321 S MYRTLE AVE	311,499	286,019	-8.2%	640	312	-51.2%	-10.6%
1625 S MYRTLE AVE M2	1625 S MYRTLE AVE M2	46,461	31,955	-31.2%	-	-	0.0%	-31.2%
CITY HALL MONROVIA	415 S IVY AVE	274,773	262,099	-4.6%	7,913	8,057	1.8%	-1.7%
COMMUNITY CENTER	119 W PALM AVE	180,011	178,335	-0.9%	1,072	856	-20.2%	-3.8%
PUBLIC WORKS	600 S MOUNTAIN AVE	158,491	156,786	-1.1%	535	442	-17.4%	-2.5%
MONROVIA HISTORICAL MUSEUM	742 E LEMON AVE	24,350	21,149	-13.1%	-	-	0.0%	-13.1%
1201 N CANYON	1201 N CANYON	6,962	11,632	67.1%	-	-	0.0%	67.1%

FIRE STATION	2055 S MYRTLE AVE	92,818	92,906	0.1%	1,035	1,313	26.8%	6.7%

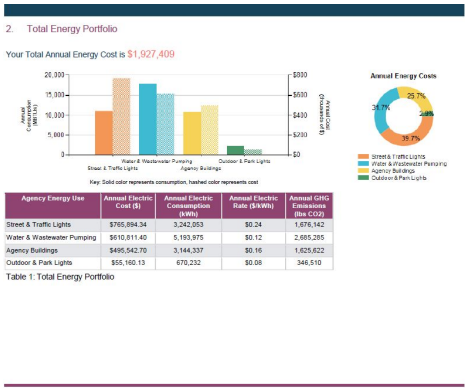
Appendix C - Methodology

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
- Analysis period for electricity and gas results were based on usage during period July 1, 2018 – June 30, 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



2. Total Energy Portfolio

Your Total Annual Energy Cost is $1,927,409

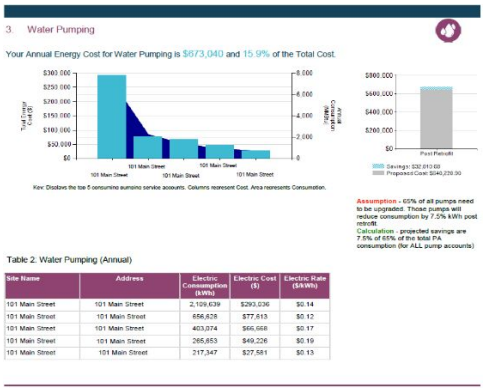
Annual Energy Costs

Agency Energy Use	Annual Electric Cost ($)	Annual Electric Consumption (kWh)	Annual Electric Rate ($/kWh)	Annual GHG Emissions (lbs CO2)
Street & Traffic Lights	$765,894.34	3,242,053	$0.24	1,676,142
Water & Wastewater Pumping	$610,611.40	5,193,975	$0.12	2,685,285
Agency Buildings	$495,542.70	3,144,337	$0.16	1,625,622
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 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].



3. Water Pumping

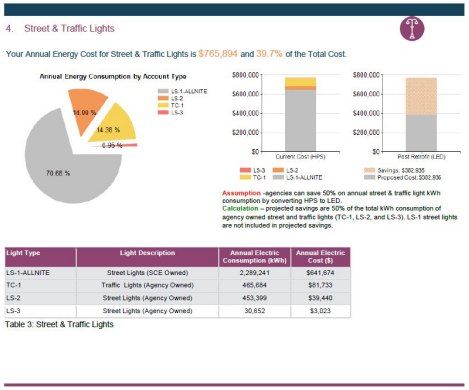
Your Annual Energy Cost for Water Pumping is $673,040 and 15.9% of the Total Cost.

Table 2: Water Pumping (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost ($)	Electric Rate ($/kWh)
101 Main Street	101 Main Street	2,109,639	$293,036	$0.14
101 Main Street	101 Main Street	656,628	$77,613	$0.12
101 Main Street	101 Main Street	403,074	$66,668	$0.17
101 Main Street	101 Main Street	265,853	$49,226	$0.19
101 Main Street	101 Main Street	217,347	$27,581	$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].



4. Street & Traffic Lights

Your Annual Energy Cost for Street & Traffic Lights is $765,894 and 39.7% of the Total Cost.

Annual Energy Consumption by Account Type

LS-1-ALLNITE
LS-2
TC-1
LS-3

14.38 %
0.95 %
70.68 %

$800,000
$600,000
$400,000
$200,000
$0

Current Cost (HPS)
Post Retrofit (LED)

LS-3
LS-2
TC-1
LS-1-ALLNITE

Savings: $382,935
Proposed Cost: $382,936

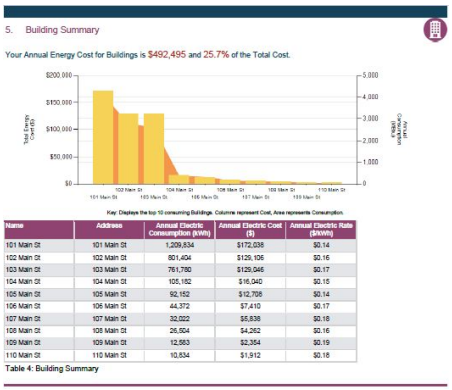
Assumption -agencies can save 50% on annual street & traffic light kWh consumption by converting HPS to LED.
Calculation – projected savings are 50% of the total kWh consumption of agency owned street and traffic lights (TC-1, LS-2, and LS-3). LS-1 street lights are not included in projected savings.

Light Type	Light Description	Annual Electric Consumption (kWh)	Annual Electric Cost ($)
LS-1-ALLNITE	Street Lights (SCE Owned)	2,289,241	$641,674
TC-1	Traffic Lights (Agency Owned)	465,664	$61,733
LS-2	Street Lights (Agency Owned)	453,399	$39,440
LS-3	Street Lights (Agency Owned)	30,652	$3,023

Table 3: Street & Traffic Lights

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.

$200,000
$150,000
$100,000
$50,000
$0

5,000
4,000
3,000
2,000
1,000
0

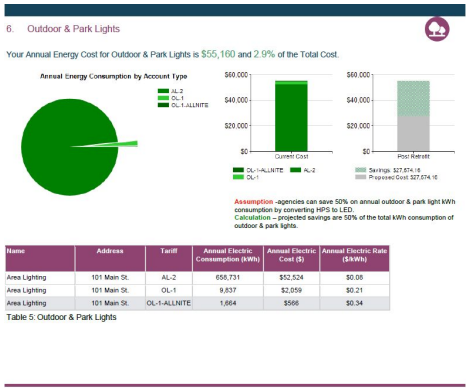
Key: Displays the top 10 consuming Buildings. Columns represent Cost, Area represents Consumption.

Name	Address	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
101 Main St	101 Main St	1,209,834	$172,038	$0.14
102 Main St	102 Main St	801,404	$129,106	$0.16
103 Main St	103 Main St	761,790	$129,046	$0.17
104 Main St	104 Main St	105,182	$16,040	$0.15
105 Main St	105 Main St	92,152	$12,705	$0.14
106 Main St	106 Main St	44,372	$7,410	$0.17
107 Main St	107 Main St	32,022	$5,836	$0.18
108 Main St	108 Main St	26,624	$4,262	$0.16
109 Main St	109 Main St	12,583	$2,354	$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.

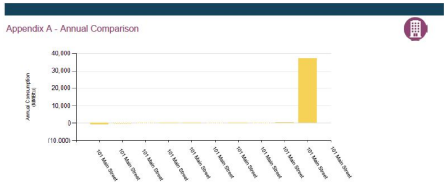


Name	Address	Tariff	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
Area Lighting	101 Main St.	AL-2	658,731	$52,524	$0.08
Area Lighting	101 Main St.	OL-1	9,837	$2,059	$0.21
Area Lighting	101 Main St.	OL-1-ALLNITE	1,664	$566	$0.34

Table 5: Outdoor & Park Lights

Appendix A - Annual Comparison

- Annual comparison data is weather normalized and includes the following metrics for the agency buildings with the greatest change (absolute value) in annual energy consumption (MMBtu) from baseline period to analysis period: annual energy costs, annual energy consumption (kWh and therms).
- Baseline period for electricity and gas results were based on usage during July 1, 2018 – June 30, 2019.
- Analysis period for electricity and gas results were based on usage during July 1, 2018 – June 30, 2019.



Key: Displays Buildings with the top 10 absolute change in MMBtu from baseline period to analysis period. Electricity is the solid yellow shade, Natural Gas is the hashed yellow shade.

Table 6: Annual Comparison

Site Name	Address	Prior Year Electric Consumption (kWh)	Current Year Electric Consumption (kWh)	Annual Change in Electricity	Prior Year Gas Consumption (therms)	Current Year Gas Consumption (therms)	Annual Change in Gas	Annual Change in Energy MMBtu
101 Main Street	101 Main Street	237,242	10,124	-95.7%	-	-	0.0%	-95.7%
101 Main Street	101 Main Street	-	-	0.0%	12,809	6,743	-47.4%	-47.4%
101 Main Street	101 Main Street	-	-	0.0%	3,611	945	-73.8%	-73.8%
101 Main Street	101 Main Street	394,840	331,968	-15.9%	-	-	0.0%	-15.9%
101 Main Street	101 Main Street	46,337	3,673	-92.1%	-	-	0.0%	-92.1%
101 Main Street	101 Main Street	-	-	0.0%	91,969	90,642	-1.4%	-1.4%
101 Main Street	101 Main Street	48,146	9,350	-80.6%	-	-	0.0%	-80.6%
101 Main Street	101 Main Street	-	-	0.0%	3,787	2,638	-30.3%	-30.3%
101 Main Street	101 Main Street	1,891,310	2,014,924	6.5%	-	-	0.0%	6.5%
101 Main Street	101 Main Street	5,839,026	16,688,547	185.8%	-	-	0.0%	185.8%

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

Tariff Type	Service Account Number
TOU-GS1A	46851890, 46851869, 46851904, 31465869,
TOU-GS2B	47427957
GS-GN-10	102193769,
TOU-GS1E	48019163, 102193769

Endnotes

[1] Corporate Responsibility Report. (2015). In Southern California Edison. Retrieved 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. Retrieved from https://www.arb.ca.gov/cc/scopingplan/document/appendices_volume2.pdf

[3] Based on SoCalREN previous project estimates.