

Comparative Energy Analysis Report

Prepared for
City of Redlands

Prepared by
The Energy Coalition

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

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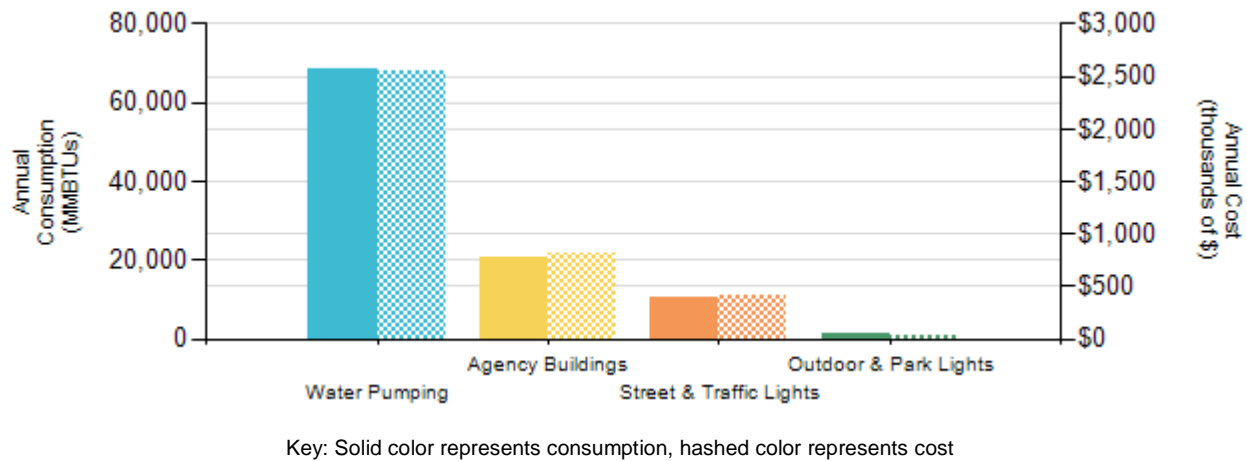
1. Overview

This report is intended to provide a framework for the Redlands 4, 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, Stefan Slattery at sslattery@energycoalition.org.

2. Total Energy Portfolio

Your Total Annual Energy Cost is **\$3,779,067**



Annual Energy Costs

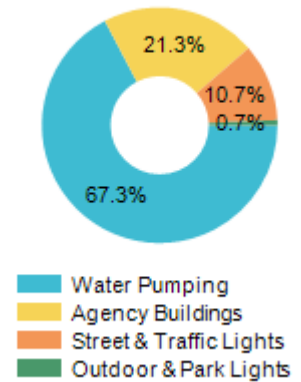


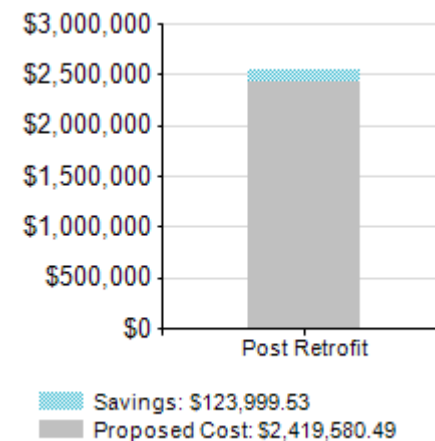
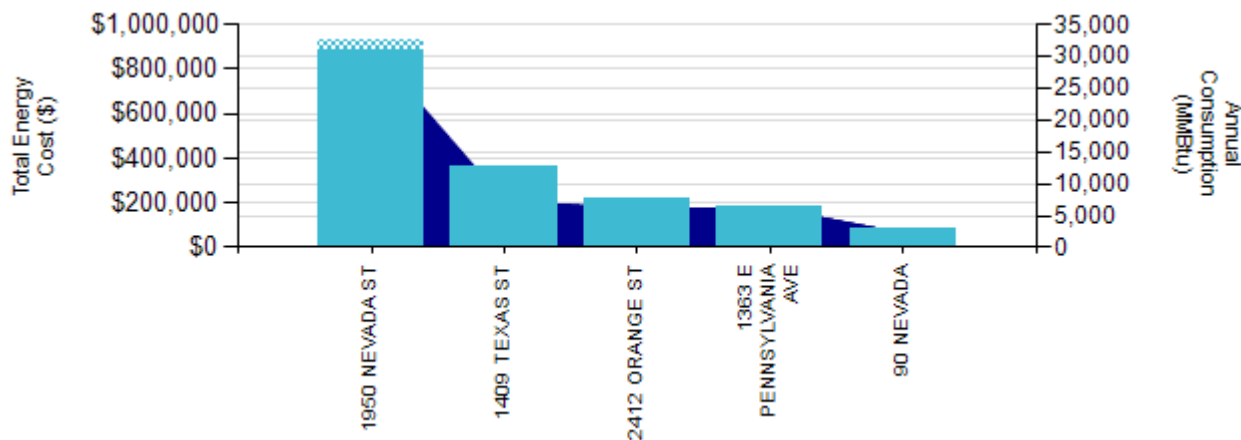
Table 1: Total Energy Portfolio (Annual)

Agency Energy Use	Electric Consumption (kWh)	Electric Cost (\$)	Gas Consumption (therms)	Gas Cost (\$)	Total Energy Consumption (MMBTus)	Total Energy Cost (\$)	GHG Emissions (lbs CO2)
Water Pumping	18,572,631	\$2,503,387	52,850	\$40,193	68,655	\$2,543,580	9,602,050
Agency Buildings	4,822,294	\$762,270	41,862	\$43,500	20,640	\$805,770	2,493,126
Street & Traffic Lights	3,002,126	\$402,587	0	\$0	10,243	\$402,587	1,552,099
Outdoor & Park Lights	333,536	\$27,129	0	\$0	1,138	\$27,129	172,438



3. Water Pumping

Your Annual Energy Cost for Water Pumping is **\$2,543,580** and **67.3%** 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)
Water Pumping	1950 NEVADA ST	7,621,385	\$887,129	\$0.12
Water Pumping	1409 TEXAS ST	2,152,724	\$359,196	\$0.17
Water Pumping	2412 ORANGE ST	1,764,319	\$216,835	\$0.12
Water Pumping	1363 E PENNSYLVANIA AVE	1,824,621	\$179,543	\$0.10
Water Pumping	90 NEVADA	659,769	\$88,673	\$0.13

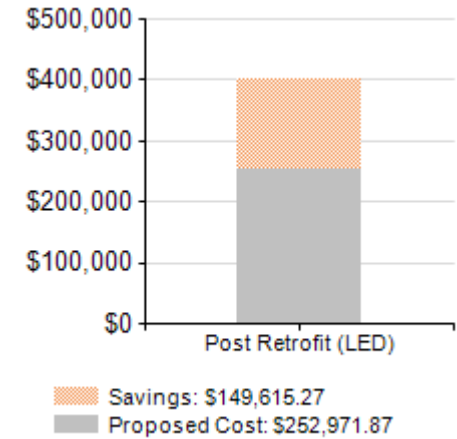
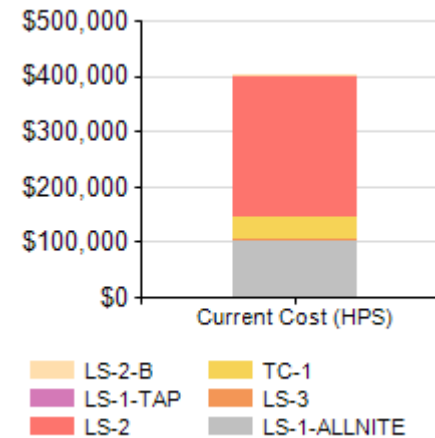
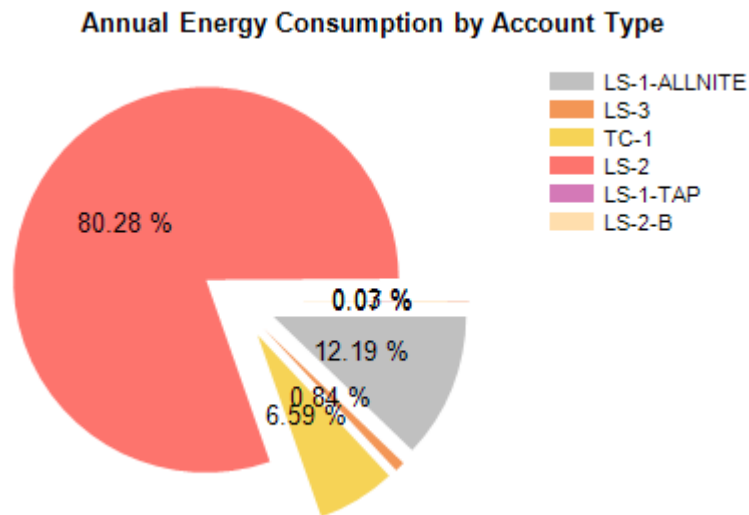
Assumption - 65% of all pumps need to be upgraded. Those pumps will reduce consumption by 7.5% kWh post retrofit.

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



4. Street & Traffic Lights

Your Annual Energy Cost for Street & Traffic Lights is **\$402,587** and **10.7%** 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.

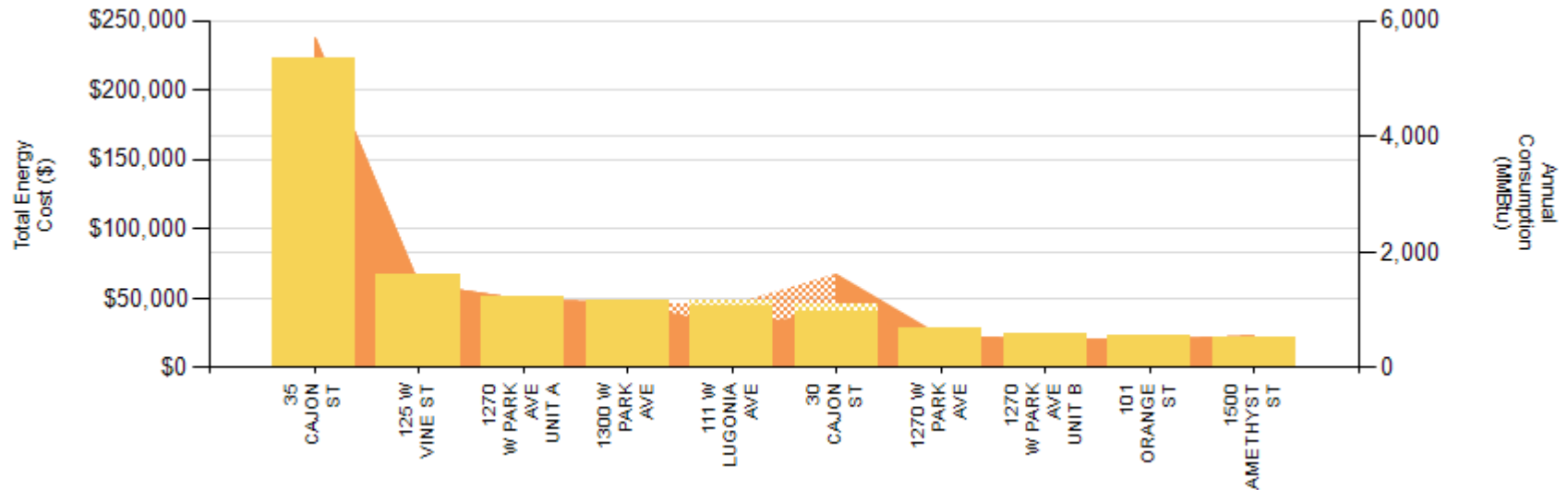
Table 3: Street & Traffic Lights (Annual)

Tariff	Tariff Description	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)
LS-2	Street Lights (Agency Owned - unmetered)	2,410,022	\$257,403	0.11
LS-1-ALLNITE	Street Lights (SCE Owned)	366,078	\$103,091	0.28
TC-1	Traffic Signal Lights (Agency Owned)	197,909	\$39,134	0.20
LS-3	Street Lights (Agency Owned - metered)	25,235	\$2,424	0.10
LS-2-B	Street Lights (Agency Owned - unmetered)	2,076	\$270	0.13
LS-1-TAP	Street Lights (SCE Owned)	806	\$266	0.33

5. Building Summary



Your Annual Energy Cost for Buildings is **\$805,770** and **21.3%** 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.

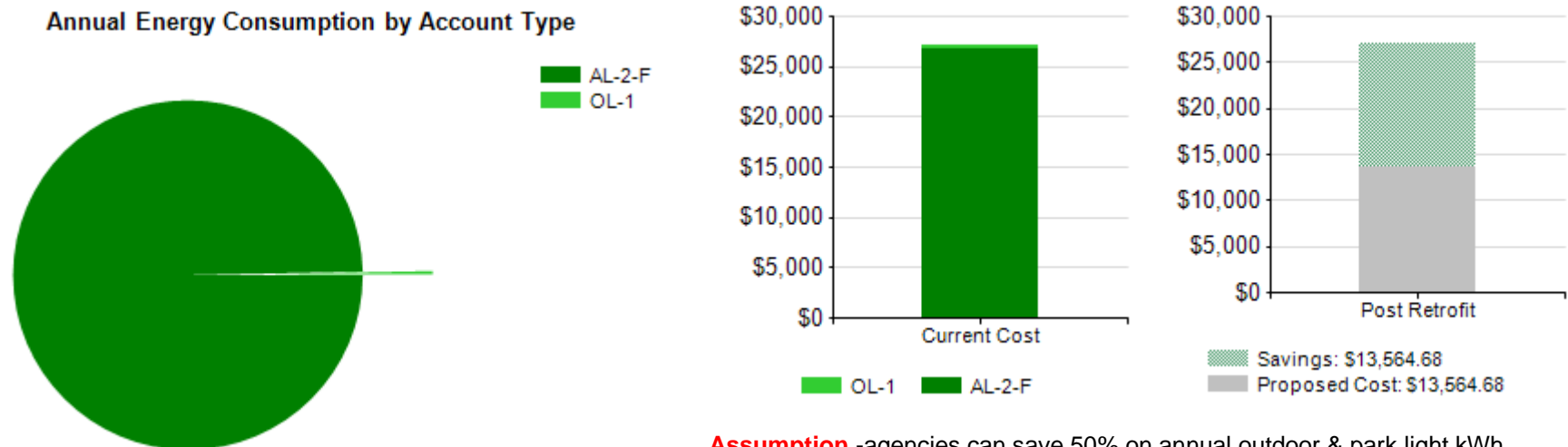
Table 4: Building Summary (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)	Gas Consumption (therms)	Gas Cost (\$)	Gas Rate (\$/therm)
City Hall/Civic Center	35 CAJON ST	1,669,888	\$223,046	\$0.13	0	\$0	\$0.00
A.K Smiley Library	125 W VINE ST	424,690	\$67,313	\$0.16	0	\$0	\$0.00
Fire Station 264	1270 W PARK AVE UNIT A	345,067	\$50,621	\$0.15	0	\$0	\$0.00
Police Department Parking	1300 W PARK AVE	329,325	\$48,839	\$0.15	0	\$0	\$0.00
Community Center	111 W LUGONIA AVE	203,743	\$44,192	\$0.22	3,945	\$4,361	\$1.11
Police Department	30 CAJON ST	285,212	\$40,030	\$0.14	6,461	\$6,219	\$0.96
LNG/CNG Fueling Station	1270 W PARK AVE	160,616	\$28,803	\$0.18	0	\$0	\$0.00
Support Services Bureau	1270 W PARK AVE UNIT B	144,955	\$24,251	\$0.17	0	\$0	\$0.00
Redlands Mall	101 ORANGE ST	143,274	\$23,511	\$0.16	0	\$0	\$0.00
Unknown	1500 AMETHYST ST	161,267	\$22,513	\$0.14	0	\$0	\$0.00



6. Outdoor & Park Lights

Your Annual Energy Cost for Outdoor & Park Lights is **\$27,129** 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 Rate (\$/kWh)
Area Lighting	Various	AL-2-F	332,504	\$26,717	\$0.08
Area Lighting	Various	OL-1	1,032	\$413	\$0.40

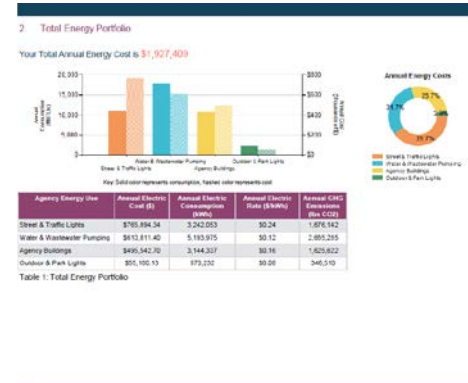
Appendix A - Methodology

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>
- Analysis period for electricity and gas results were based on usage during period June 1, 2019 – May 31, 2020.
- 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].

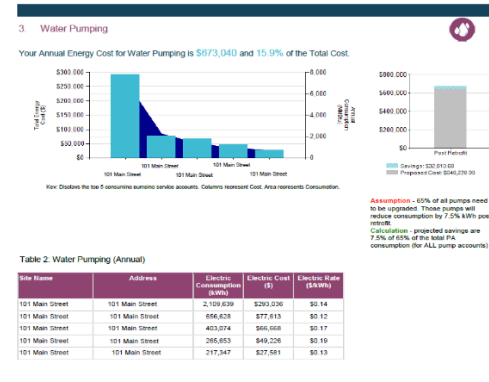
2. Total Energy Portfolio

- 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



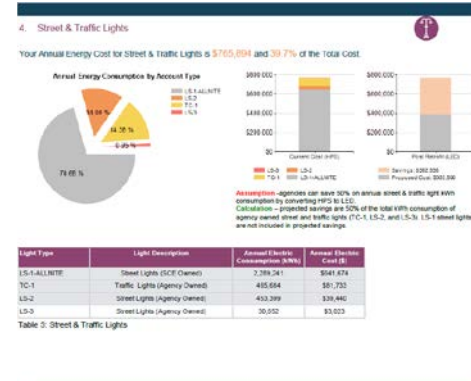
3. Water Pumping

- 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].



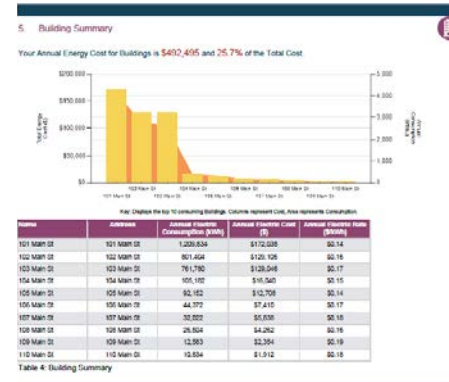
4. Street & Traffic Lights

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

- Electric: 20925021 (1950 Nevada), 19727518 (1950 Nevada St.)

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.
