

Comparative Energy Analysis Report

Prepared for
City of San Bernardino

Prepared by
The Energy Coalition

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

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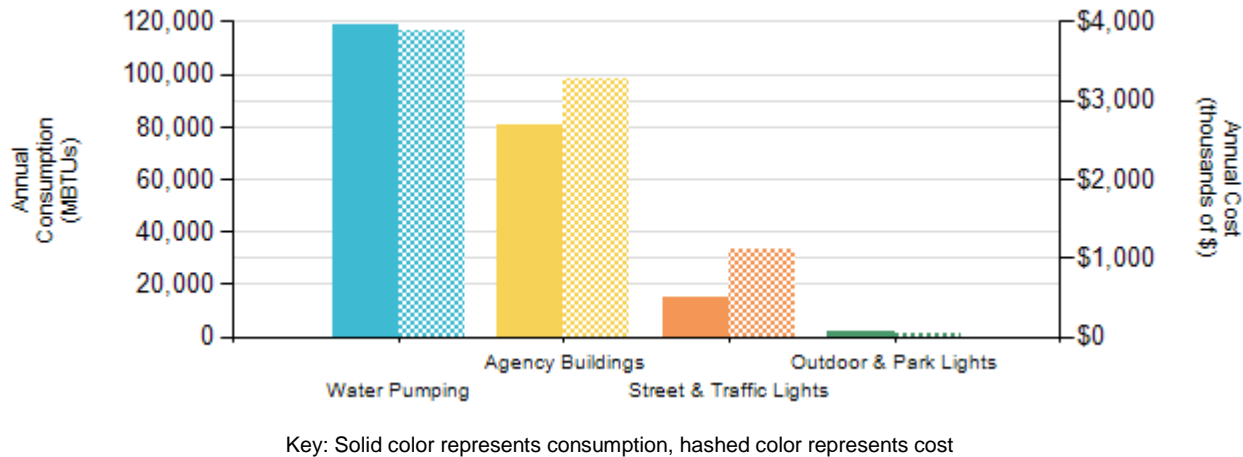
1. Overview

This report is intended to provide a framework for the City of San Bernardino, 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.com). Any questions about this report can be directed to your assigned Project Manager, Lauren Seymour at lseymour@energycoalition.org.

2. Total Energy Portfolio

Your Total Annual Energy Cost is **\$8,316,442**



Annual Energy Costs

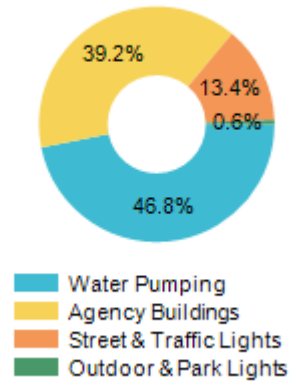


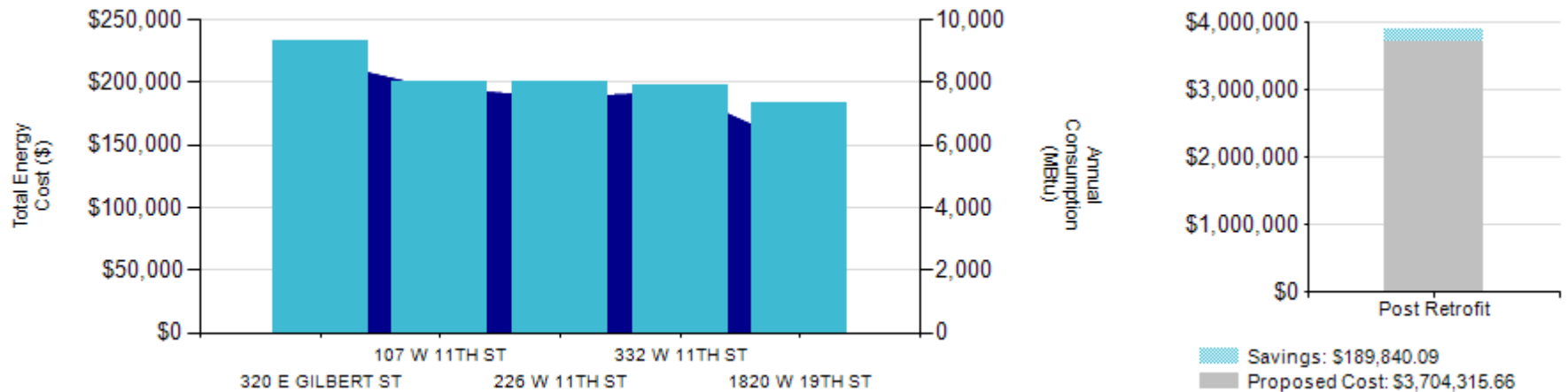
Table 1: Total Energy Portfolio (Annual)

Agency Energy Use	Electric Consumption (kWh)	Electric Cost (\$)	Gas Consumption (therms)	Gas Cost (\$)	Total Energy Consumption (MBTUs)	Total Energy Cost (\$)	GHG Emissions (lbs CO2)
Water Pumping	34,938,915	\$3,894,156	0	\$0	119,141,702	\$3,894,156	18,063,419
Agency Buildings	23,444,110	\$3,260,392	5,723	\$999	80,516,761	\$3,261,391	12,120,605
Street & Traffic Lights	4,439,349	\$1,110,516	0	\$0	15,138,179	\$1,110,516	2,295,143
Outdoor & Park Lights	573,290	\$50,380	0	\$0	1,954,918	\$50,380	296,391



3. Water Pumping

Your Annual Energy Cost for Water Pumping is **\$3,894,156** and **46.8%** 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	320 E GILBERT ST	2,531,919	\$233,190	\$0.09
Water Pumping	107 W 11TH ST	2,276,497	\$200,104	\$0.09
Water Pumping	226 W 11TH ST	2,205,234	\$200,015	\$0.09
Water Pumping	332 W 11TH ST	2,244,608	\$197,750	\$0.09
Water Pumping	1820 W 19TH ST	1,740,717	\$183,943	\$0.11

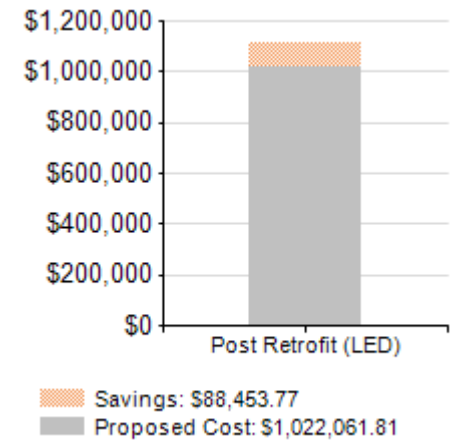
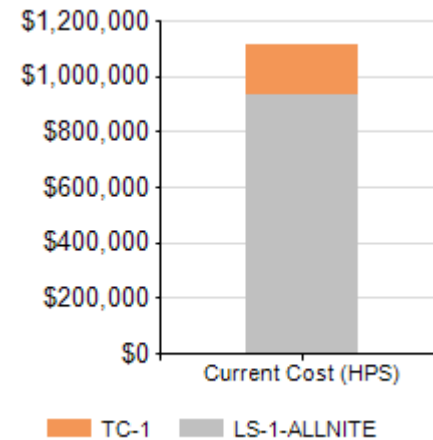
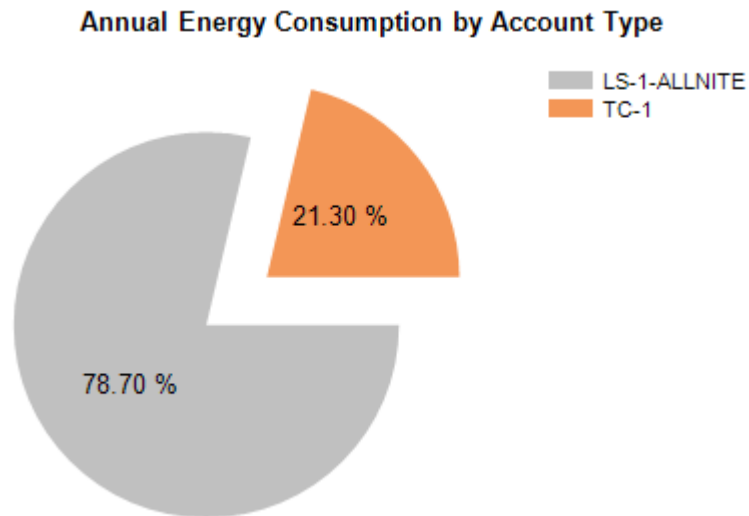
Assumption - 65% of all pumps need to be upgraded. Those pumps will reduce consumption by 7.5% kWh post retrofit.

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 **\$1,110,516** and **13.4%** 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.

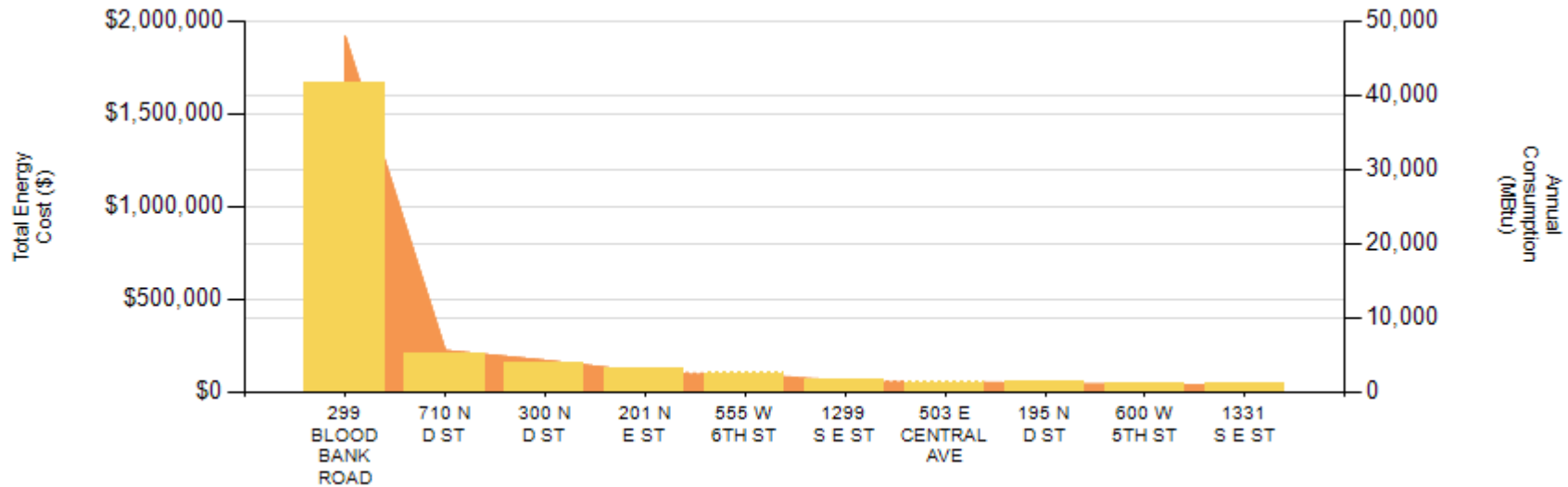
Table 3: Street & Traffic Lights (Annual)

Tariff	Tariff Description	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)
LS-1-ALLNITE	Street Lights (SCE Owned)	3,493,664	\$933,608	0.27
TC-1	Traffic Signal Lights (Agency Owned)	945,685	\$176,908	0.19

5. Building Summary



Your Annual Energy Cost for Buildings is **\$3,261,391** and **39.2%** 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.

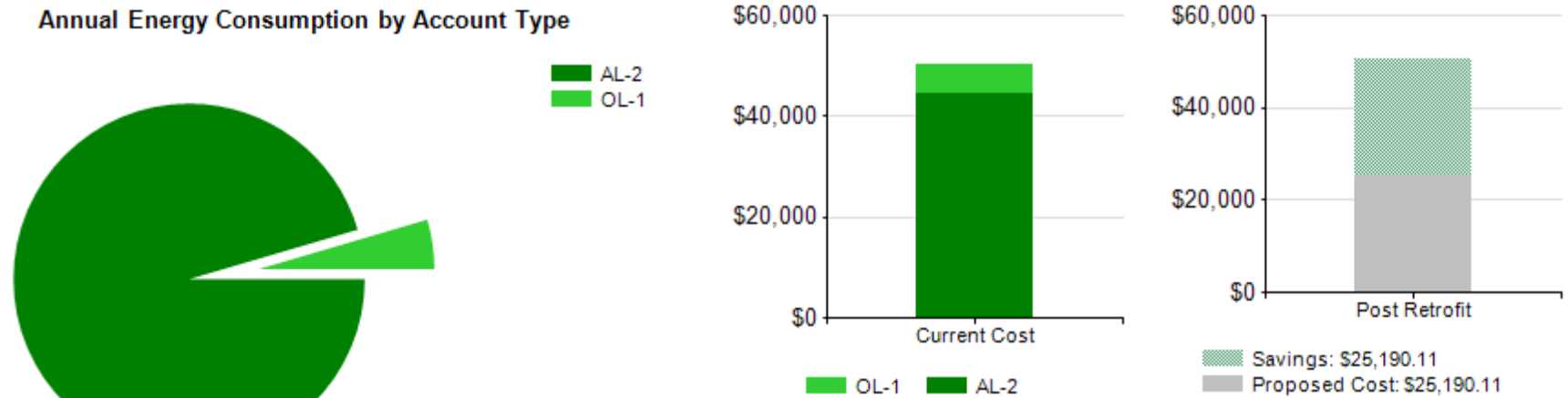
Table 4: Building Summary (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost (\$)	Electric Rate (\$/kWh)	Gas Consumption (therms)	Gas Cost (\$)	Gas Rate (\$/therm)
SBMWD WWTP	299 BLOOD BANK ROAD	14,053,568	\$1,668,572	\$0.12	0	\$0	N/A
Police Department HQ	710 N D ST	1,619,567	\$206,495	\$0.13	0	\$0	N/A
City Hall	300 N D ST	1,226,889	\$151,153	\$0.12	0	\$0	N/A
Public Works Office Bldg.	201 N E ST	768,188	\$126,043	\$0.16	0	\$0	N/A
Feldheym Central Library	555 W 6TH ST	612,605	\$103,369	\$0.17	2,848	\$481	\$0.17
SBMWD Facility or Station	1299 S E ST	423,873	\$61,123	\$0.14	0	\$0	N/A
Mill Headstart/State Pre-School 4	503 E CENTRAL AVE	327,282	\$58,962	\$0.18	2,876	\$518	\$0.18
Water Department Yard	195 N D ST	305,998	\$51,652	\$0.17	0	\$0	N/A
Senior Citizen Bldg	600 W 5TH ST	261,796	\$43,196	\$0.17	0	\$0	N/A
SBMWD Facility or Station	1331 S E ST	273,842	\$40,857	\$0.15	0	\$0	N/A

6. Outdoor & Park Lights



Your Annual Energy Cost for Outdoor & Park Lights is **\$50,380** and **0.6%** 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	547,226	\$44,531	\$0.08
Area Lighting	Various	OL-1	26,063	\$5,849	\$0.22

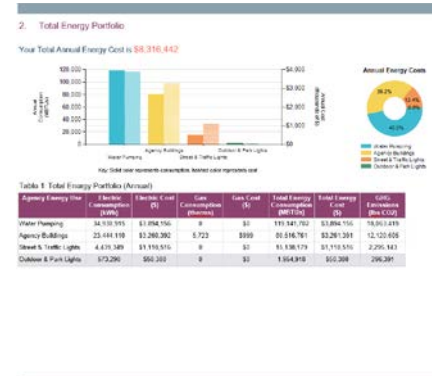
Appendix A - Methodology

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>
 - All electricity and gas results were based on usage during period April 1, 2017 – April 1, 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].
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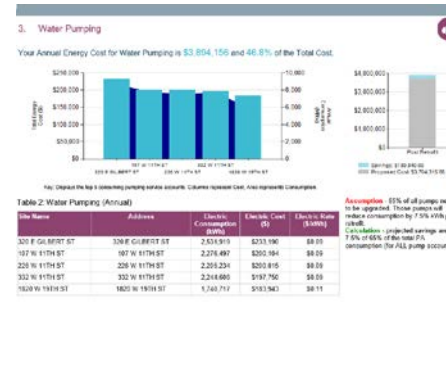
2. Total Energy Portfolio

- 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



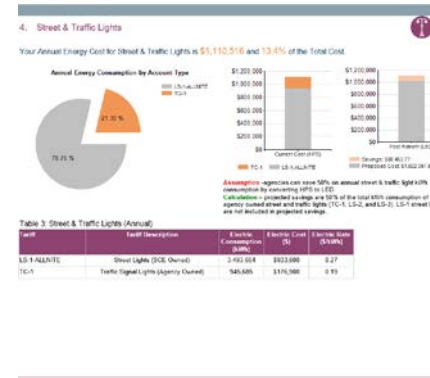
3. Water Pumping

- 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].



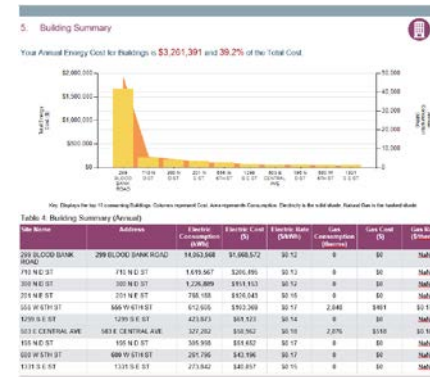
4. Street & Traffic Lights

- 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].



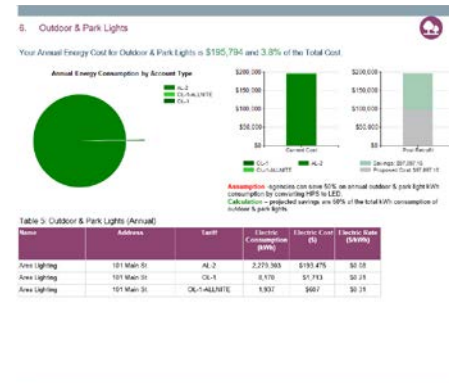
5. Building Summary

- 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 Type	Meter Number
PA	22664975, 21247173, 1322517, 1322271
AL/OL	1322502, 977186, 1322503
LS-3	1322787, 22871887, 1322866, 5702064, 1322607, 8843541, 11320008, 22501528, 18364293, 1322267, 10285368, 1593367, 41184607, 18943114, 1823756, 21391939, 46525837, 12915413, 1322694, 17180365, 31343112
TC-1	1322320, 33458586, 4949953, 1322376, 5775939, 2884952, 28703439, 1322529, 12726916, 131904, 1322449, 1322426, 1322472, 17180236
GS	10678642, 40327189

Endnotes

[1] Corporate Responsibility Report. (2015). In Southern California Edison. Retrieved from https://www.sce.com/wps/wcm/connect/c0fcef5-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.
