Comparative Energy Analysis Report

Prepared for

Fontana Unified School District

Prepared by

The Energy Coalition

On Behalf of

The Southern California Regional Energy Network Public Agency Project Delivery Programs

Date

8/23/2019

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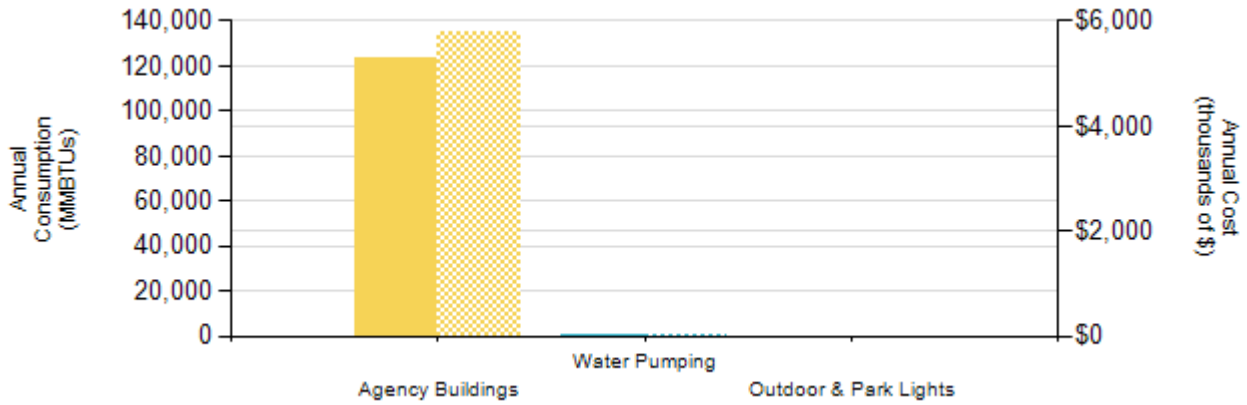
1. Overview

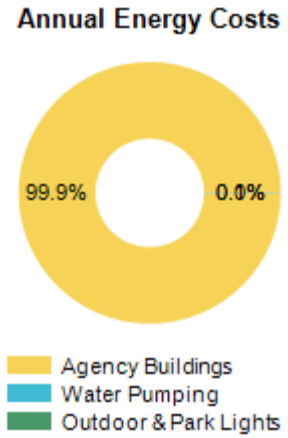
This report is intended to provide a framework for the Fontana Unified School District, referred to as “Agency” herein, to identify inefficient facilities and infrastructure and prioritize further investigation and energy efficiency retrofit work. This analysis uses only energy billing data provided 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, Angela Vaszily at avaszily@energycoalition.org.

2. Total Energy Portfolio

Your Total Annual Energy Cost is $5,796,382





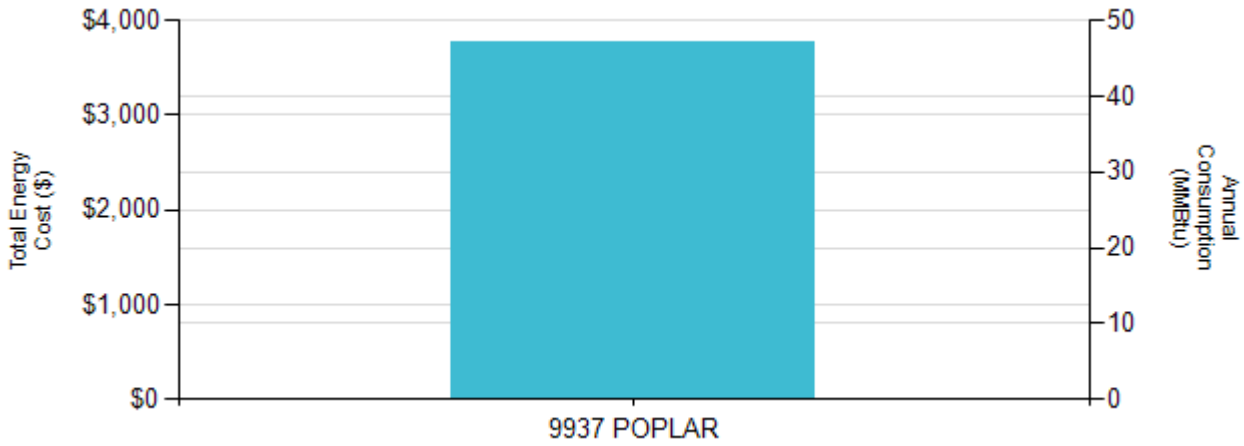
Key: Solid color represents consumption, hashed color represents cost

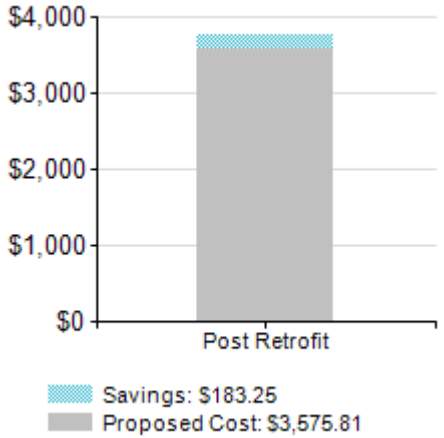
Table 1: Total Energy Portfolio (Annual)

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	29,033,632	$5,621,099	262,150	$170,912	123,352	$5,791,911	15,010,388
Water Pumping	14,375	$3,759	0	$0	49	$3,759	7,432
Outdoor & Park Lights	3,540	$712	0	$0	12	$712	1,830

3. Water Pumping

Your Annual Energy Cost for Water Pumping is $3,759 and 0.1% of the Total Cost.





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

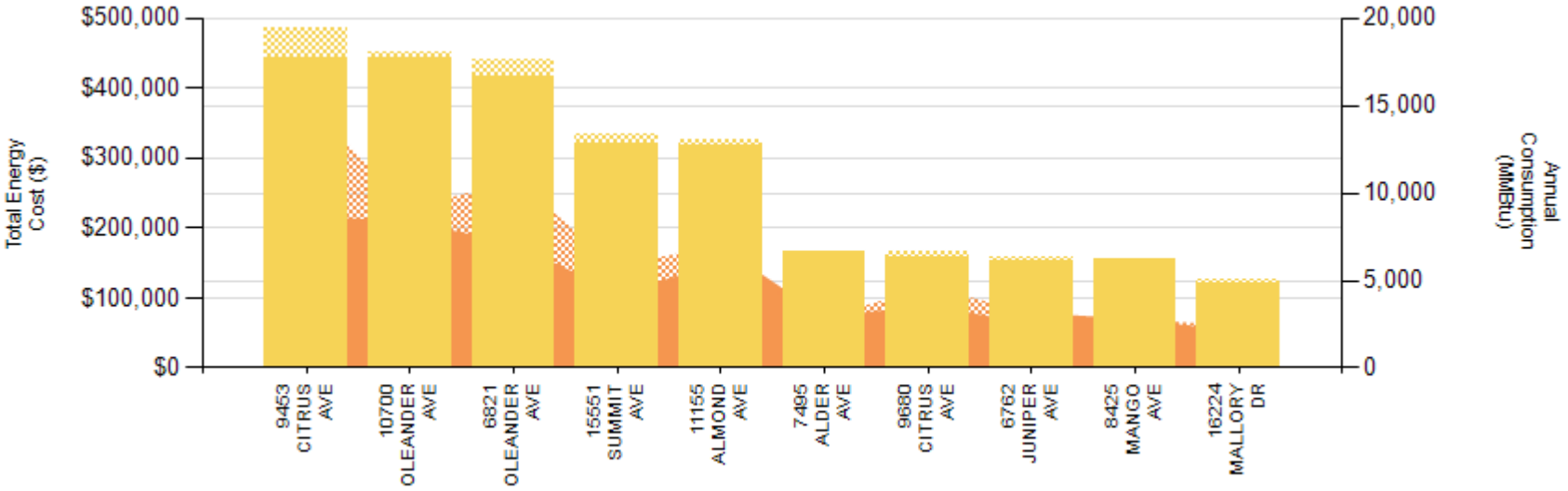
Table 2: Water Pumping (Annual)

Site Name	Address	Electric Consumption (kWh)	Electric Cost ($)	Electric Rate ($/kWh)
POPLAR ELEMENTARY	9937 POPLAR	14,375	$3,759	$0.26

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. Building Summary

Your Annual Energy Cost for Buildings is $5,791,911 and 99.9% of the Total Cost.



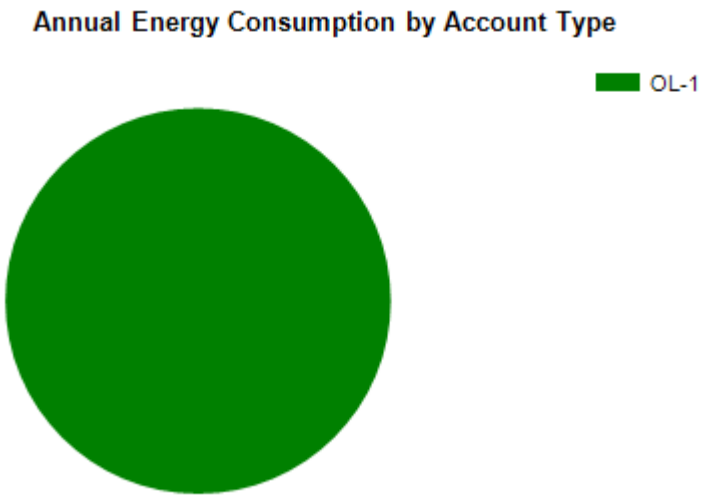
Key: Displays the top 10 consuming Buildings. Yellow columns represent Cost, Orange area represents Consumption. Electricity is the solid shade, Natural Gas is the hashed shade.

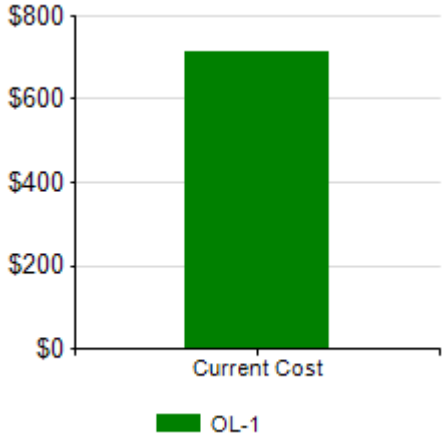
Table 4: Building Summary (Annual)

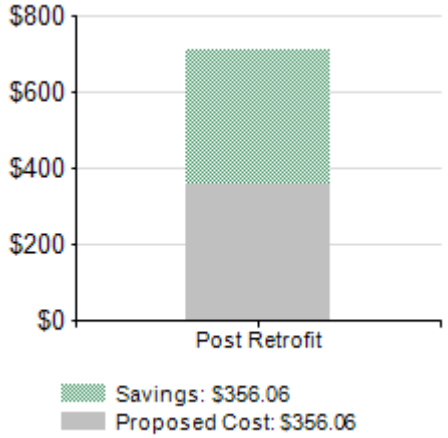
Site Name	Address	Electric Consumption (kWh)	Electric Cost ($)	Electric Rate ($/kWh)	Gas Consumption (therms)	Gas Cost ($)	Gas Rate ($/therm)	Disadvantaged Community (Yes or No)
FONTANA HIGH	9453 CITRUS AVE	2,530,983	$442,663	$0.17	64,906	$43,324	$0.67	YES
JURUPA HILLS HIGH	10700 OLEANDER AVE	2,448,161	$444,341	$0.18	7,425	$6,311	$0.85	YES
A.B MILLER HIGH	6821 OLEANDER AVE	2,074,504	$415,731	$0.20	35,990	$25,628	$0.71	YES
SUMMIT HIGH	15551 SUMMIT AVE	1,792,992	$321,075	$0.18	16,236	$12,518	$0.77	YES
KAISER HIGH	11155 ALMOND AVE	1,737,547	$318,776	$0.18	10,163	$8,239	$0.81	YES
ALDER MIDDLE	7495 ALDER AVE	841,235	$167,153	$0.20	0	$0	$0.00	YES
DISTRICT OFFICES	9680 CITRUS AVE	1,044,341	$157,505	$0.15	10,256	$8,942	$0.87	YES
RUBLE MIDDLE	6762 JUNIPER AVE	723,771	$151,992	$0.21	6,571	$5,729	$0.87	YES
FONTANA MIDDLE	8425 MANGO AVE	805,265	$154,919	$0.19	0	$0	$0.00	YES
TRUMAN MIDDLE	16224 MALLORY DR	600,476	$121,957	$0.20	3,189	$3,097	$0.97	YES

5. Outdoor & Park Lights

Your Annual Energy Cost for Outdoor & Park Lights is $712 and 0.0% 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	OL-1	3,540	$712	$0.20

Appendix A – Demand Summary

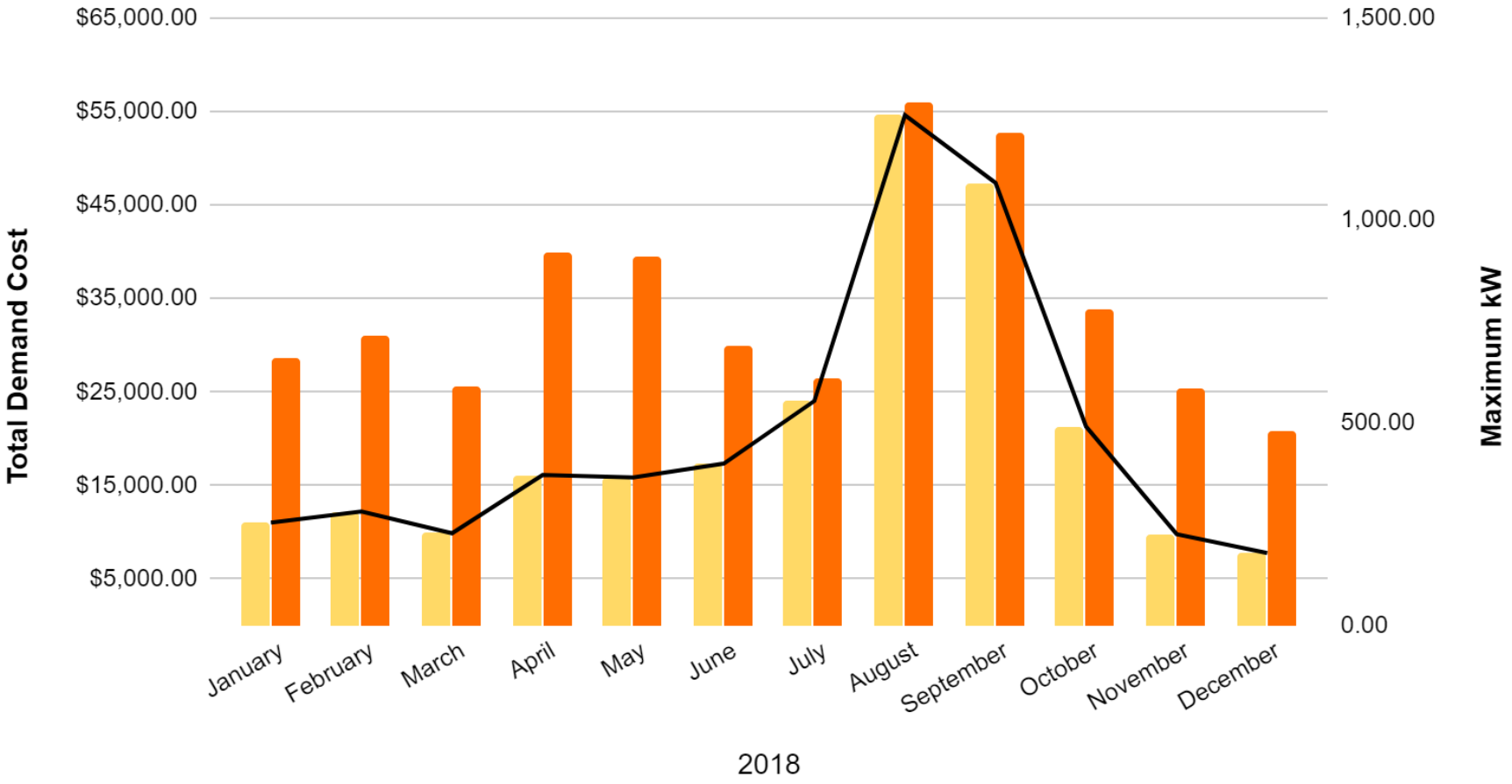
Your Annual Demand Cost for Buildings is $3,256,501 and 56.2% of the Total Energy Cost.

Facility	Total Consumption (kWh)	Peak Demand (kW)	Non Time Related Demand Cost ($)	Time Related kW Cost ($)	Total Demand Cost ($)	Total Electric Cost ($)	% Demand Cost of Total Electric Cost
FONTANA HIGH SCHOOL (TOU-8-S, TOU-GS2D, TOU-GS1E)	2,530,983	1,307	$162,908	$84,407	$247,315	$442,663	56%
JURUPA HILLS HIGH SCHOOL (TOU-8-E)	2,448,161	919	$166,545	$60,799	$227,344	$444,341	51%
A.B MILLER HIGH SCHOOL (TOU-8-R-APSE)	2,074,504	1,447	$204,808	$96,801	$301,609	$415,731	73%
SUMMIT HIGH SCHOOL UNIT A (TOU-GS3R-AE)	870,260	533	$75,533	$0	$75,533	$154,799	49%
SUMMIT HIGH SCHOOL UNIT B (TOU-GS3D-AE)	922,732	492	$77,354	$37,072	$114,426	$166,296	69%
KAISER HIGH SCHOOL (TOU-8-E-APSE, TOU-GS1E)	1,737,547	1,112	$170,669	$75,433	$246,092	$318,776	77%
ALDER MIDDLE SCHOOL (TOU-GS3R-AE)	841,235	526	$74,611	$37,037	$111,648	$167,153	67%
DISTRICT OFFICES (TOU-GS2B, TOU-GS2D, TOU-GS2R)	1,044,341	114	$47,942	$25,459	$73,401	$157,505	47%
RUBLE MIDDLE SCHOOL (TOU-8-B-APSE)	723,771	557	$74,422	$36,133	$110,555	$151,992	73%
FONTANA MIDDLE SCHOOL (TOU-GS2D, TOU-GS3E-AE)	805,265	474	$76,547	$1,615	78,162	$154,919	50%
TRUMAN MIDDLE SCHOOL (TOU-GS3E-AE)	600,476	435	$68,390	$0	$68,390	$121,957	56%

Table 5: Peak Demand Summary (2018)

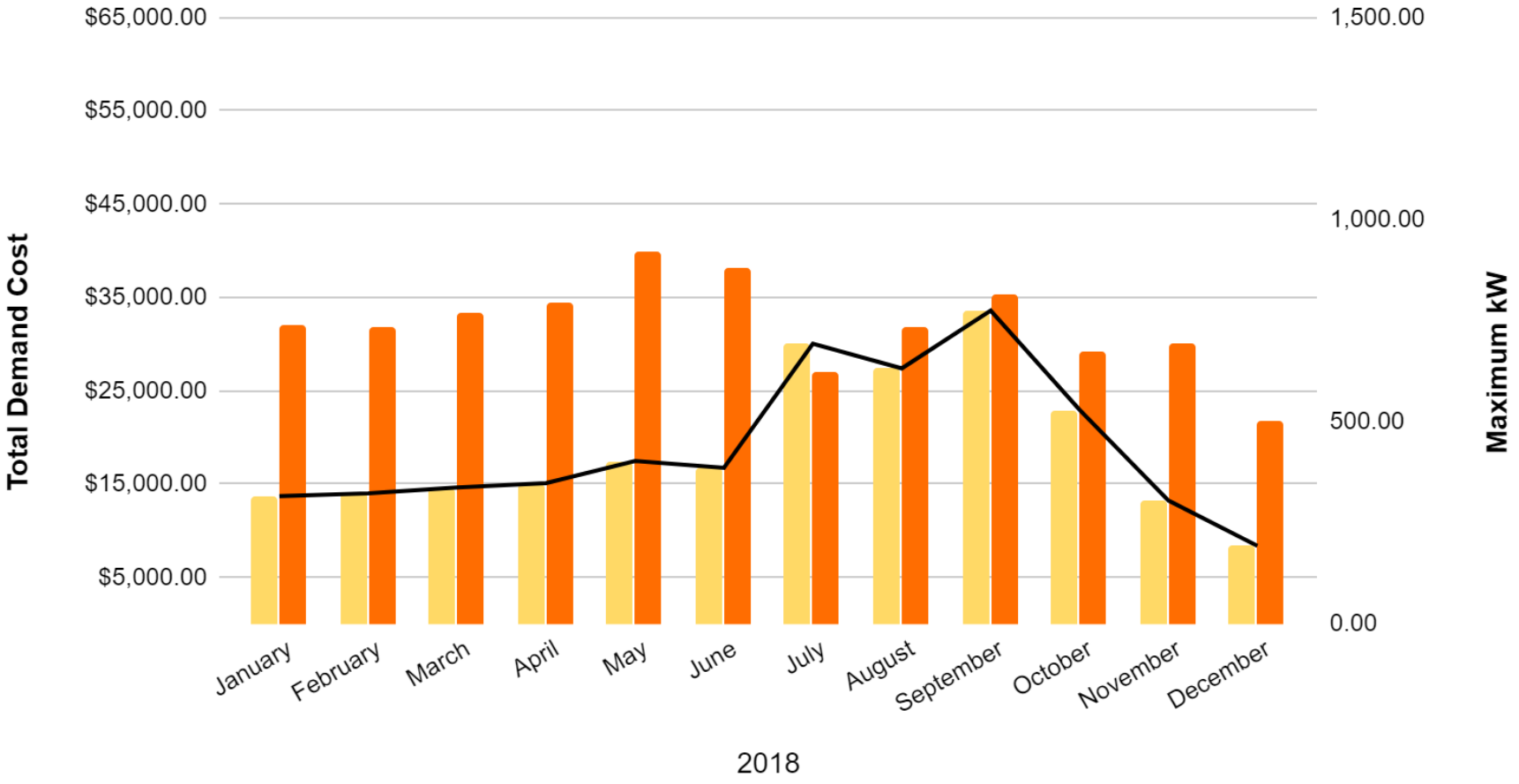
Fontana High School Demand Summary

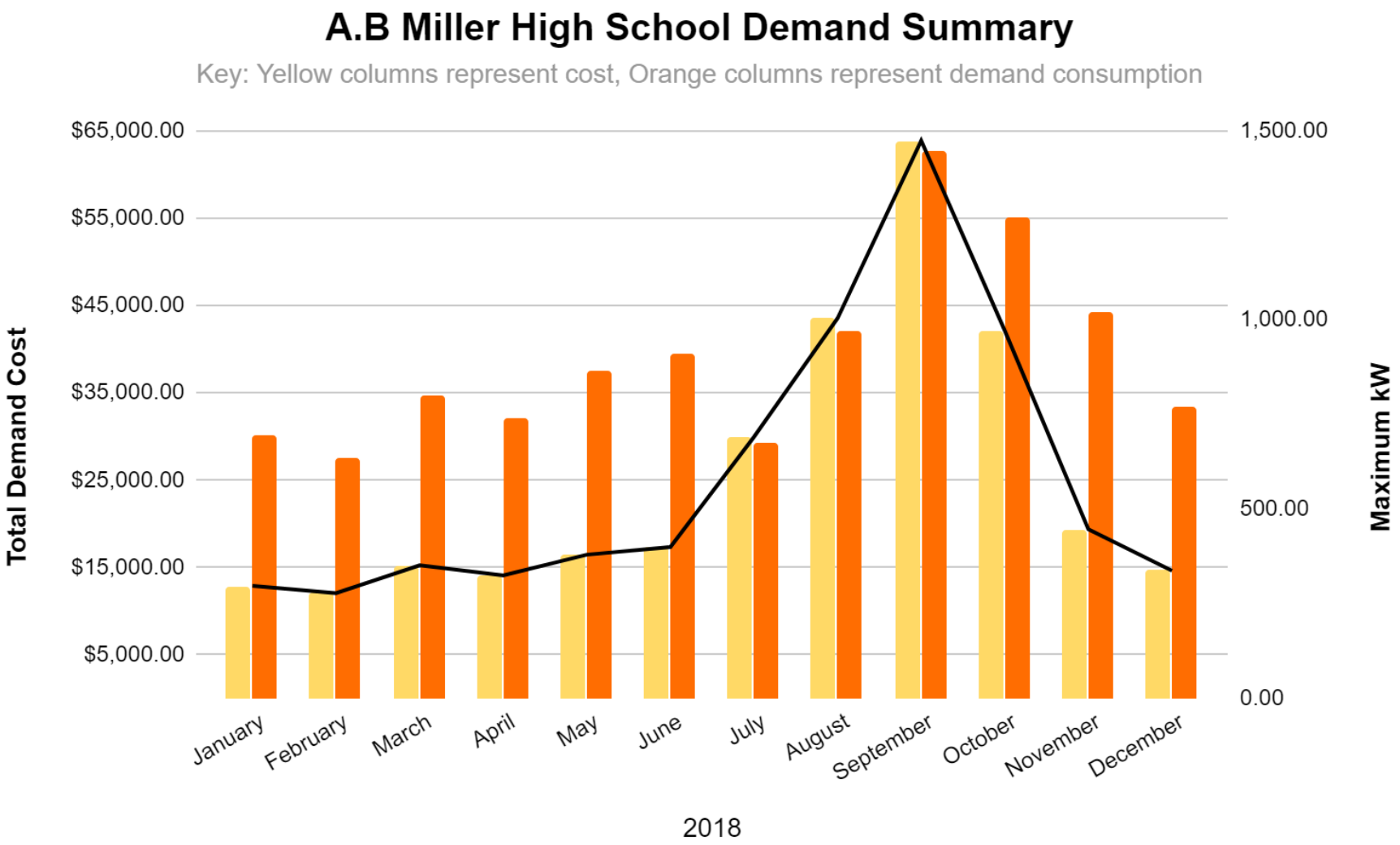
Key: Yellow columns represent cost, Orange columns represent demand consumption



Jurupa Hills High School Demand Summary

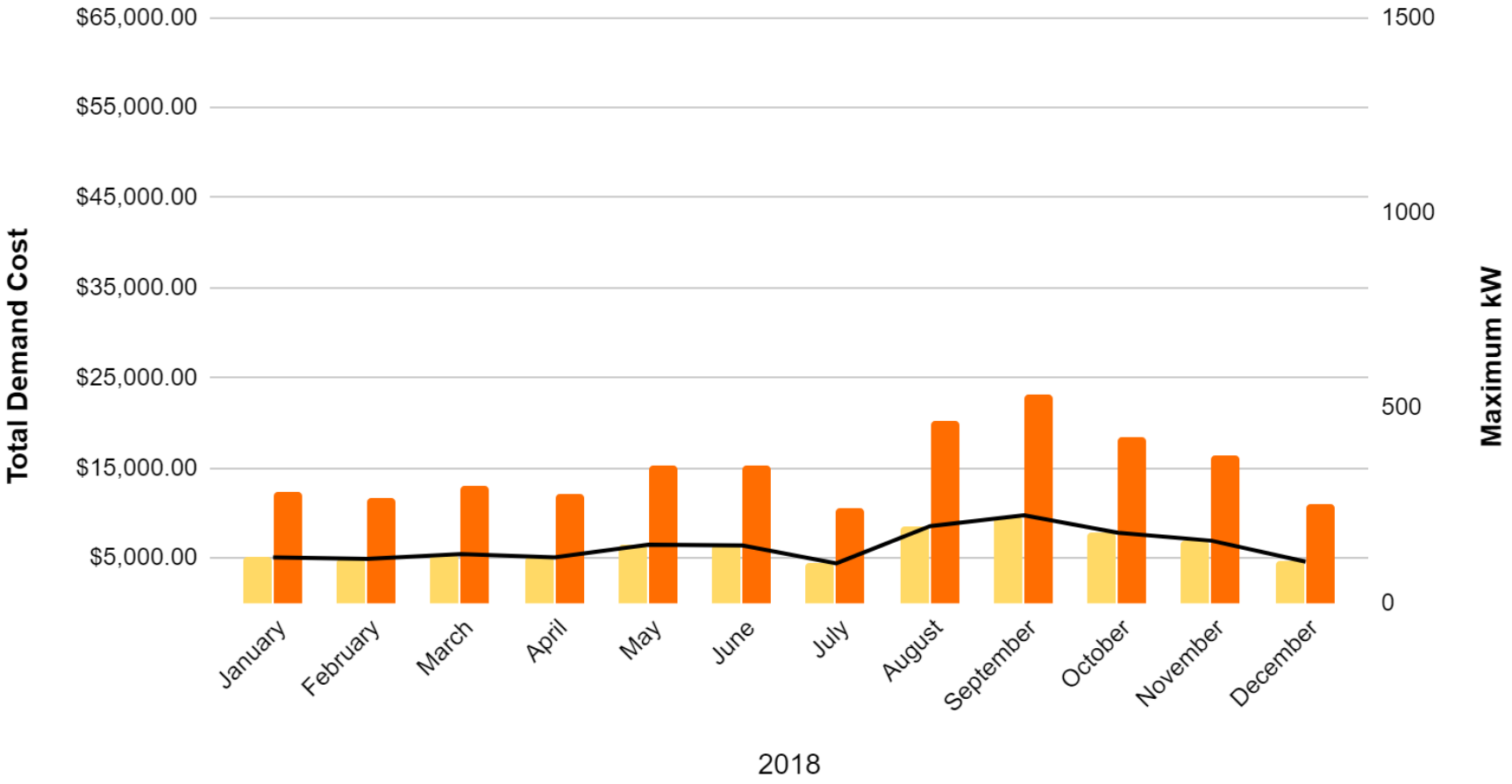
Key: Yellow columns represent cost, Orange columns represent demand consumption

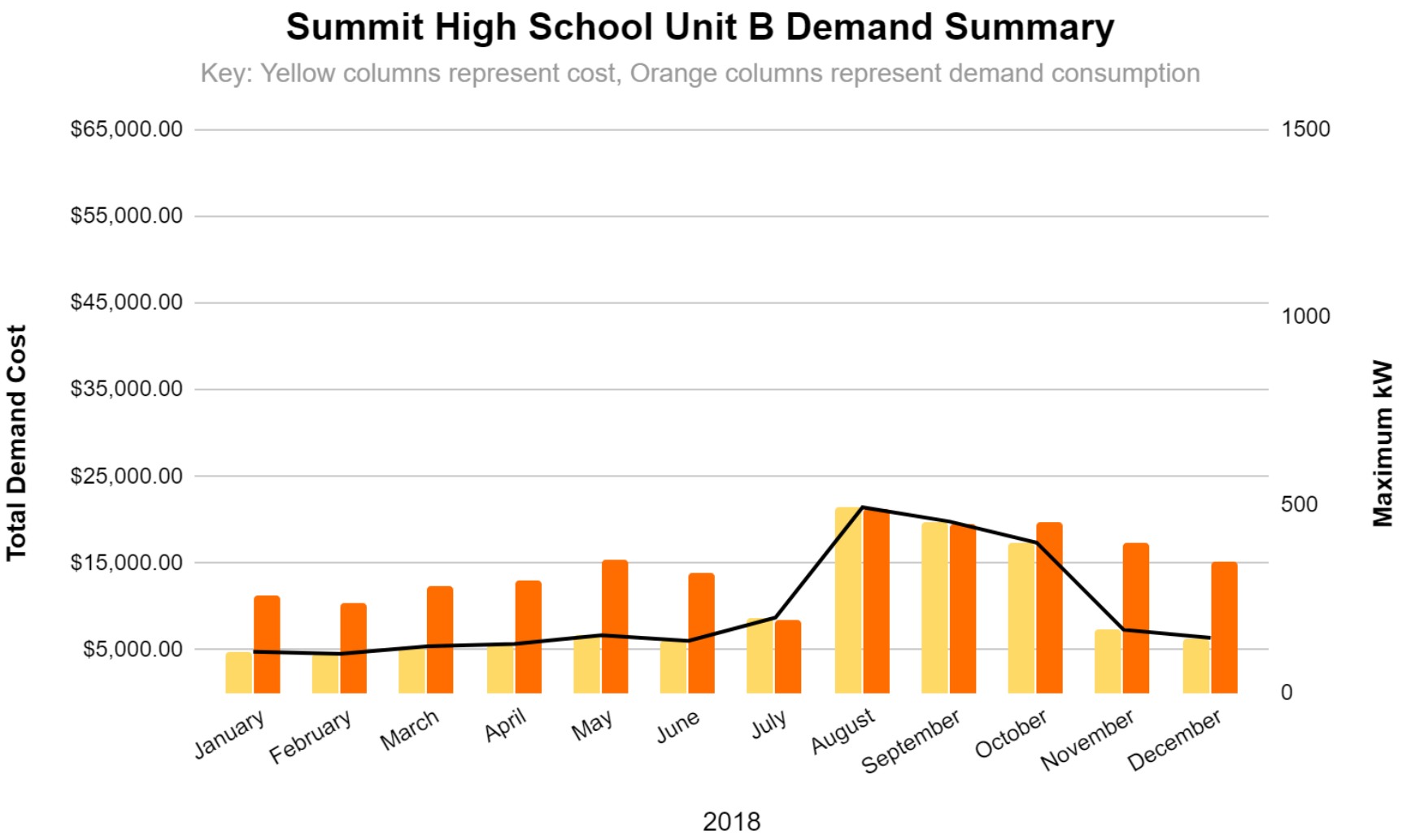



A.B Miller High School Demand Summary
Key: Yellow columns represent cost, Orange columns represent demand consumption
Total Demand Cost
$65,000.00
$55,000.00
$45,000.00
$35,000.00
$25,000.00
$15,000.00
$5,000.00
1,500.00
1,000.00
500.00
0.00
Maximum kW
January
February
March
April
May
June
July
August
September
October
November
December
2018

Summit High School Unit A Demand Summary

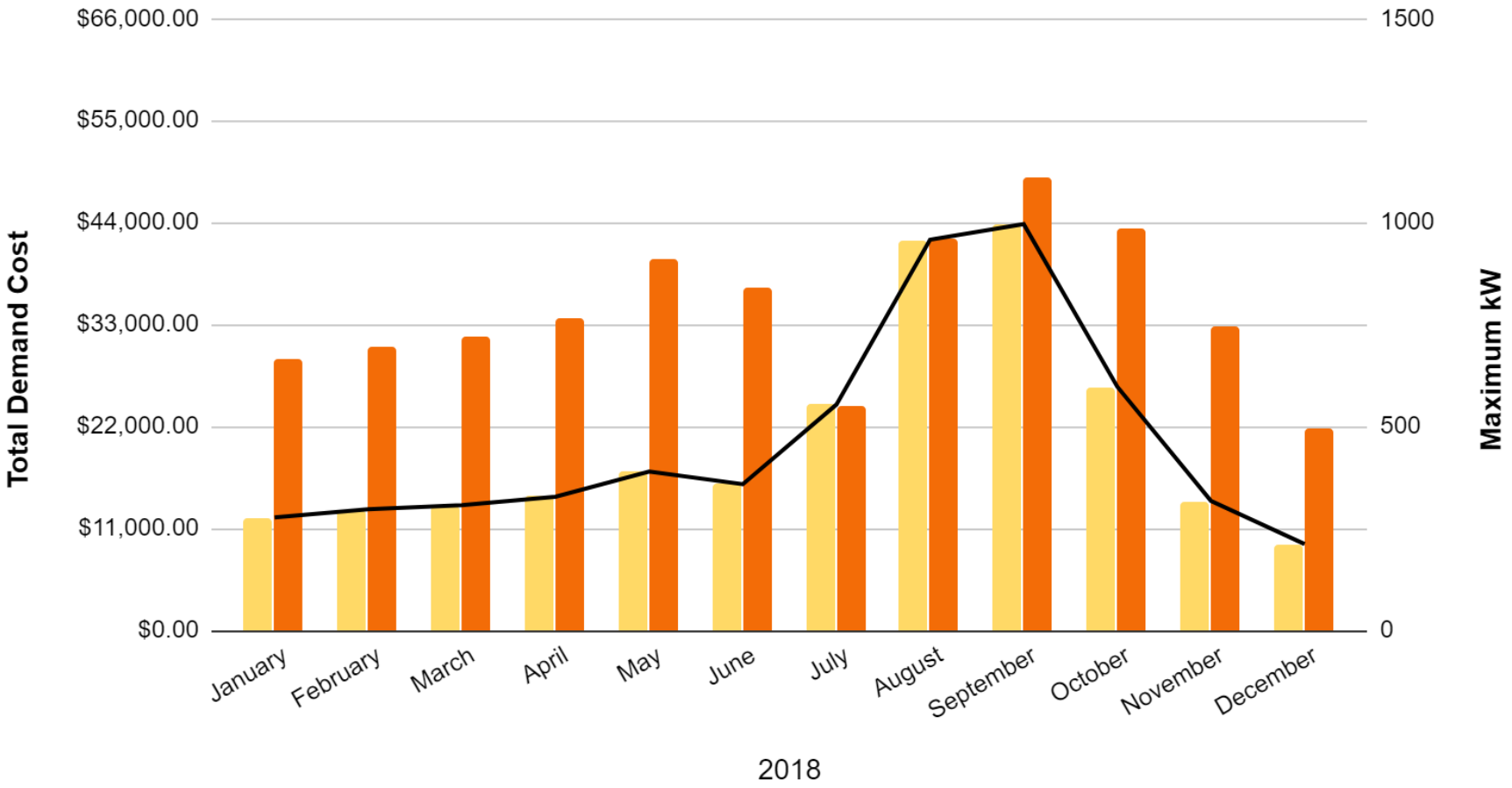
Key: Yellow columns represent cost, Orange columns represent demand consumption




Summit High School Unit B Demand Summary
Key: Yellow columns represent cost, Orange columns represent demand consumption
Total Demand Cost
$65,000.00
$55,000.00
$45,000.00
$35,000.00
$25,000.00
$15,000.00
$5,000.00
1500
1000
500
0
Maximum kW
January
February
March
April
May
June
July
August
September
October
November
December
2018

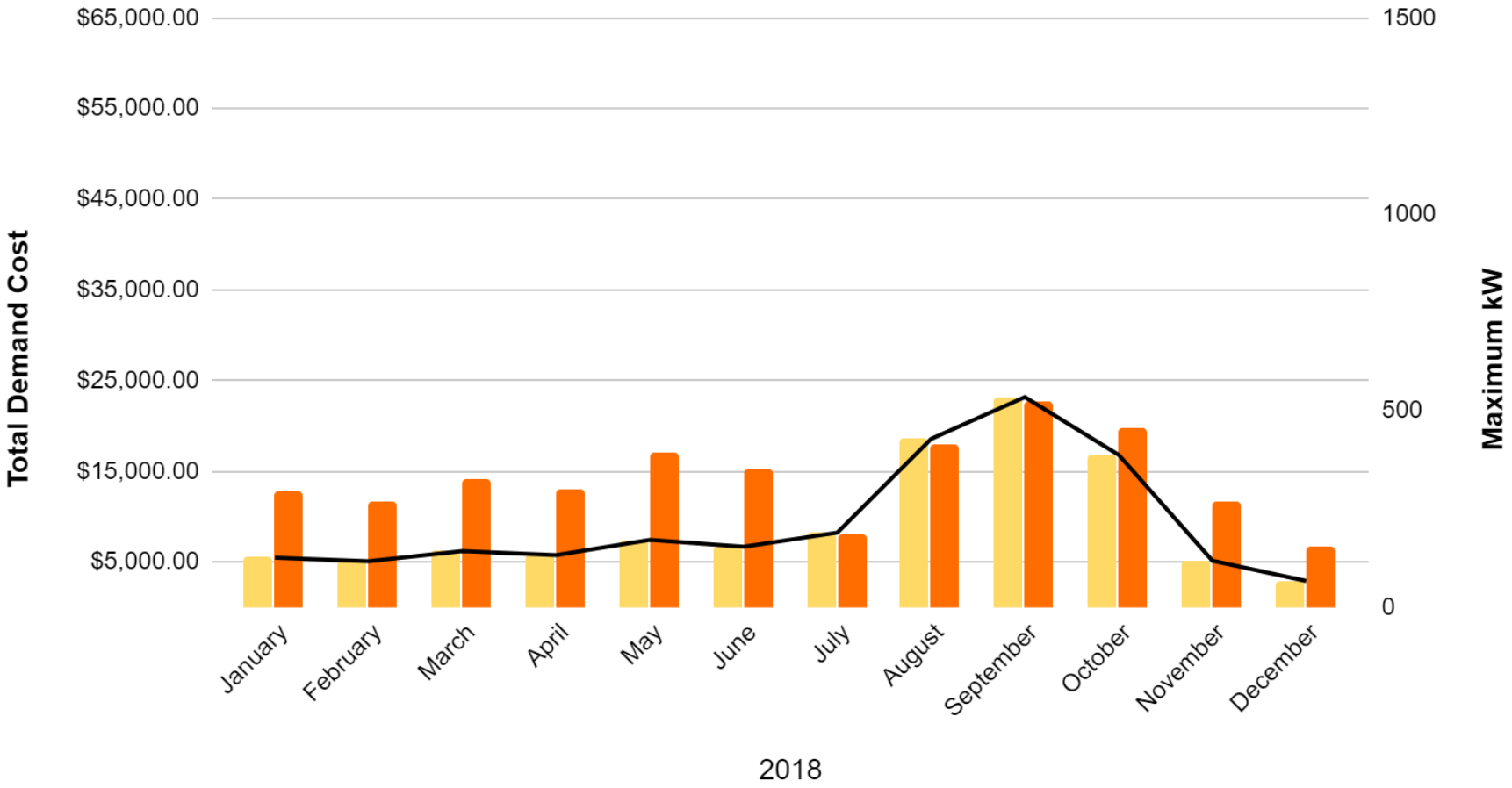
Kaiser High School Demand Summary

Key: Yellow columns represent demand cost, Orange columns represent demand consumption



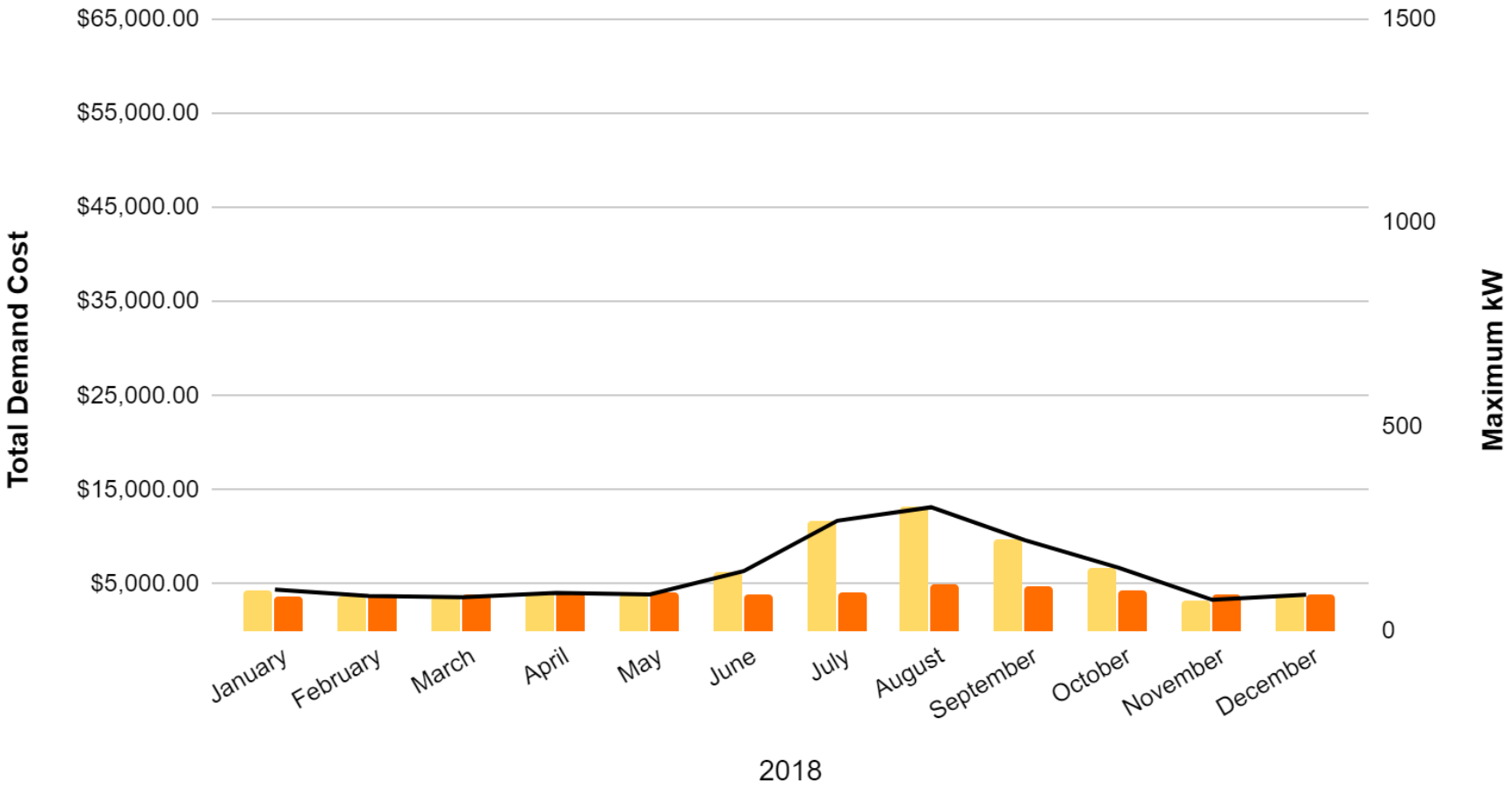
Alder Middle School Demand Summary

Key: Yellow columns represent cost, Orange columns represent demand consumption



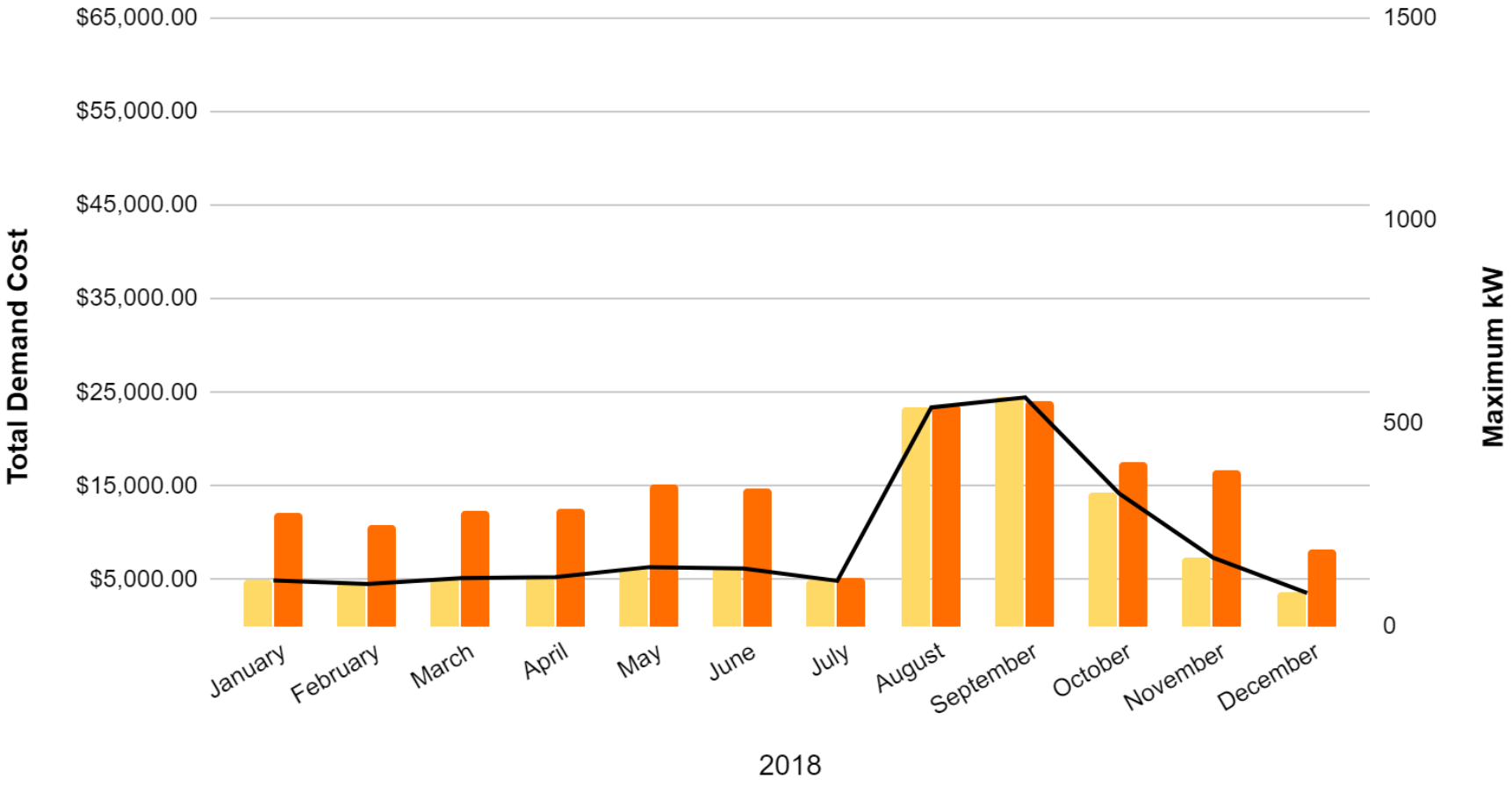
District Offices Demand Summary

Key: Yellow columns represent cost, Orange columns represent demand consumption



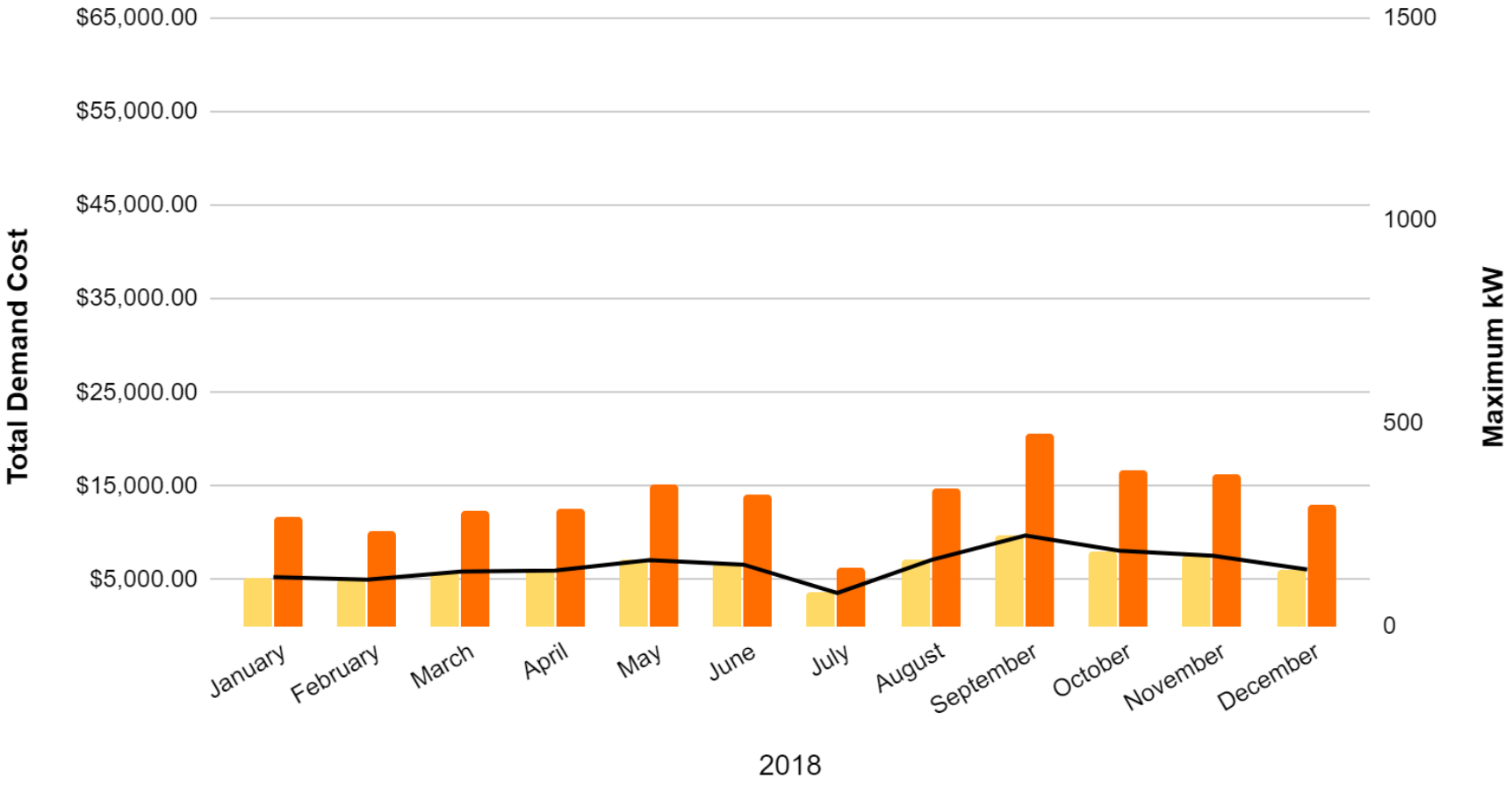
Ruble Middle School Demand Summary

Key: Yellow columns represent cost, Orange columns represent demand consumption



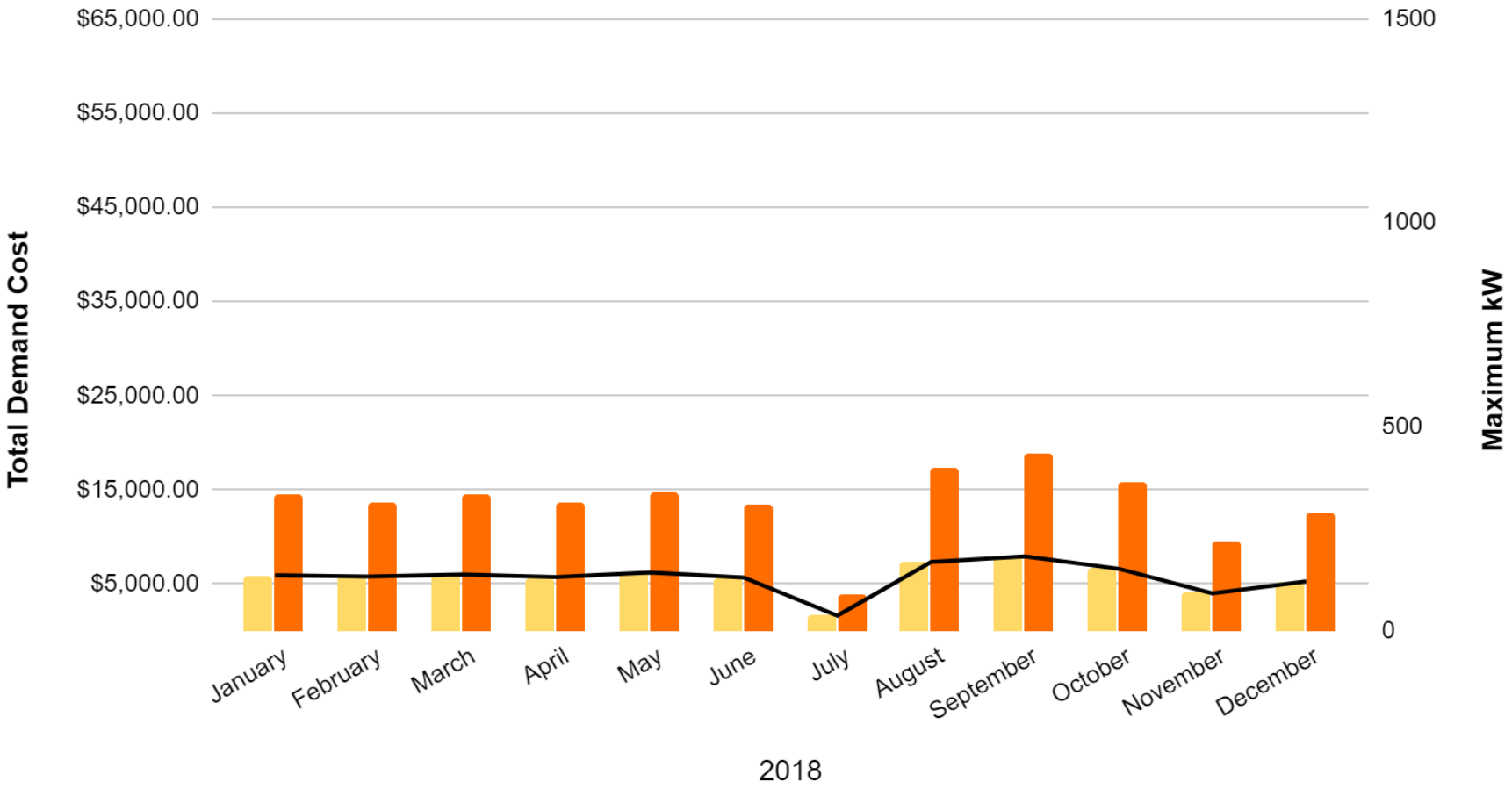
Fontana Middle School Demand Summary

Key: Yellow columns represent cost, Orange columns represent demand consumption



Truman Middle School Demand Summary

Key: Yellow columns represent cost, Orange columns represent demand consumption



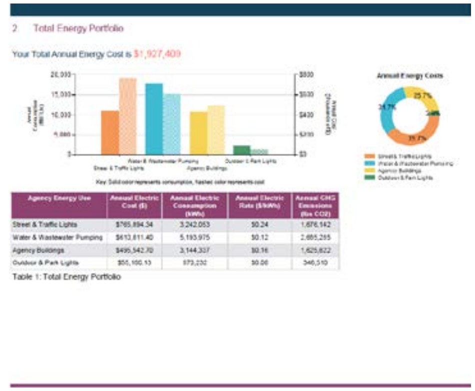
Appendix B - Methodology

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 January 1, 2018 – December 31, 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].

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
  - Buildings
  - Outdoor & Parks Lights



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	$613,811.40	5,193,975	$0.12	2,685,255
Agency Buildings	$495,542.70	3,144,337	$0.16	1,625,622
Outdoor & Park Lights	$55,100.13	573,232	$0.06	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].

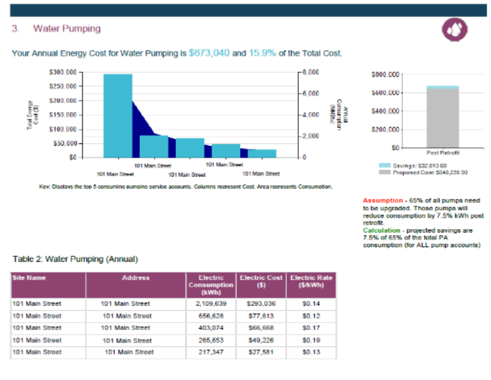
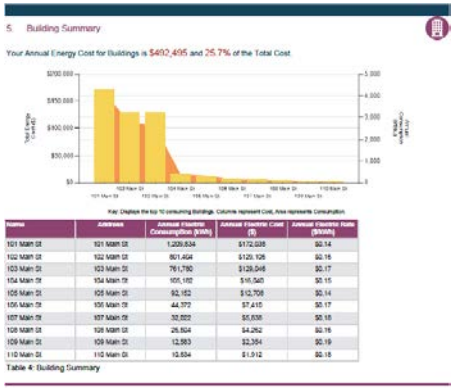


Table 2: Water Pumping (Annual)

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. 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).

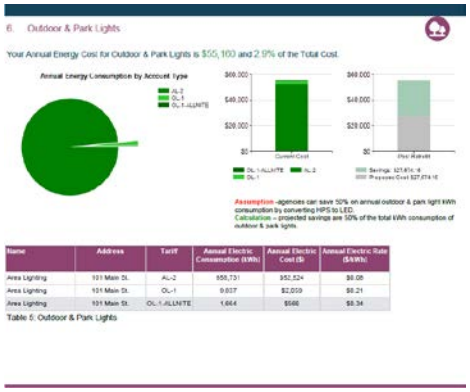

5. Building Summary

Your Annual Energy Cost for Buildings is $490,495 and 25.7% of the Total Cost

Table 4: Building Summary

5. 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.


6. Outdoor & Park Lights

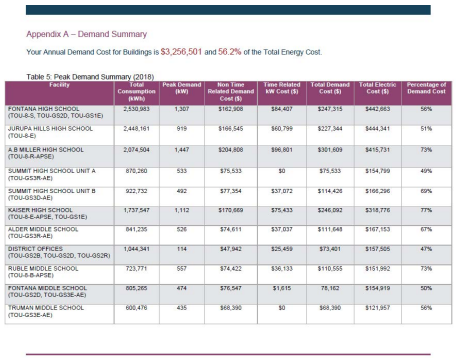
Your Annual Energy Cost for Outdoor & Park Lights is $55,103 and 2.9% of the Total Cost

Annual Energy Consumption by Account Type

Table 5: Outdoor & Park Lights

6. Demand Summary

- Demand summary data includes the following metrics of the top ten highest energy-consuming agency buildings' (total annual energy costs): Annual electric costs, annual demand costs, annual energy consumption (kW and kWh).



Appendix A – Demand Summary

Your Annual Demand Cost for Buildings is $3,256,501 and 56.2% of the Total Energy Cost.

Table 5: Peak Demand Summary (2018)

Facility	Total Consumption (kWh)	Peak Demand (kW)	Non Time Related Demand Cost ($)	Tane Related kW Cost ($)	Total Demand Cost ($)	Total Electric Cost ($)	Percentage of Demand Cost
FONTANA HIGH SCHOOL (TOU-8-S, TOU-GS2D, TOU-GS1E)	2,530,983	1,307	$162,908	$84,407	$247,315	$442,663	56%
JURUPA HILLS HIGH SCHOOL (TOU-8-E)	2,448,161	919	$166,545	$60,799	$227,344	$444,341	51%
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TRUMAN MIDDLE SCHOOL (TOU-GS3E-AE)	600,476	435	$68,390	$0	$68,390	$121,957	56%

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.