

City of Sutter Creek

ENERGY USE BENCHMARKING REPORT 2021-2023



June 2024



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This benchmarking report was developed for the City of Sutter Creek as a service of the Sierra Nevada Energy Watch (SNEW) program. The SNEW program is managed and implemented by Sierra Business Council and its authorized representatives. This energy efficiency program is funded by California utility customers and administered through Pacific Gas & Electric Company under the auspices of the California Public Utilities Commission.

Summary of Key Findings

Energy use intensities (EUI) for several City of Sutter Creek facilities are below the national median for buildings of similar types within the same climate zone. This indicates that these facilities utilize less energy than other buildings of similar use. However, the analysis also revealed that some buildings have higher EUIs than similar buildings in their climate zone, which indicates room for improvement in energy efficiency. **Table 1** and **Figure 1** below show facility EUIs over 3 years compared with the average for similar buildings in the same climate zone. The Community and Administration Building (separate buildings being analyzed together), Historic Grammar School, Monteverde Store, and Wastewater Treatment Plant (WWTP) have average EUIs below the national average. The Auditorium Building and WWTP offices have average EUIs over the national average. In some facilities, there is an increase in EUI over time, like in the Historic Grammar School, the Auditorium, and the Community and Admin Buildings, and others it is decreasing, as in the Monteverde Store, the WWTP Offices, and the WWTP.

Overall electricity usage at Sutter Creek's benchmarked facilities decreased by 6% over the three benchmarked years, in part due to a large decrease in usage at the WWTP. Electricity costs increased by 21% over the three benchmarked years and totaled over \$76,000 in 2023. The discrepancy between the decrease in usage and increase in cost is due to rising electricity rates. Similarly, natural gas usage has increased by 18% over three years, while the costs increased by 56% due to increasing gas rates. The City of Sutter Creek spent over \$12,000 in natural gas bills in 2023.

The following figures and tables summarize key results from the analysis. Details about each of these metrics are described in detail in the following sections of the report.

FIGURE 1: SITE EUI AND NATIONAL MEDIAN EUI

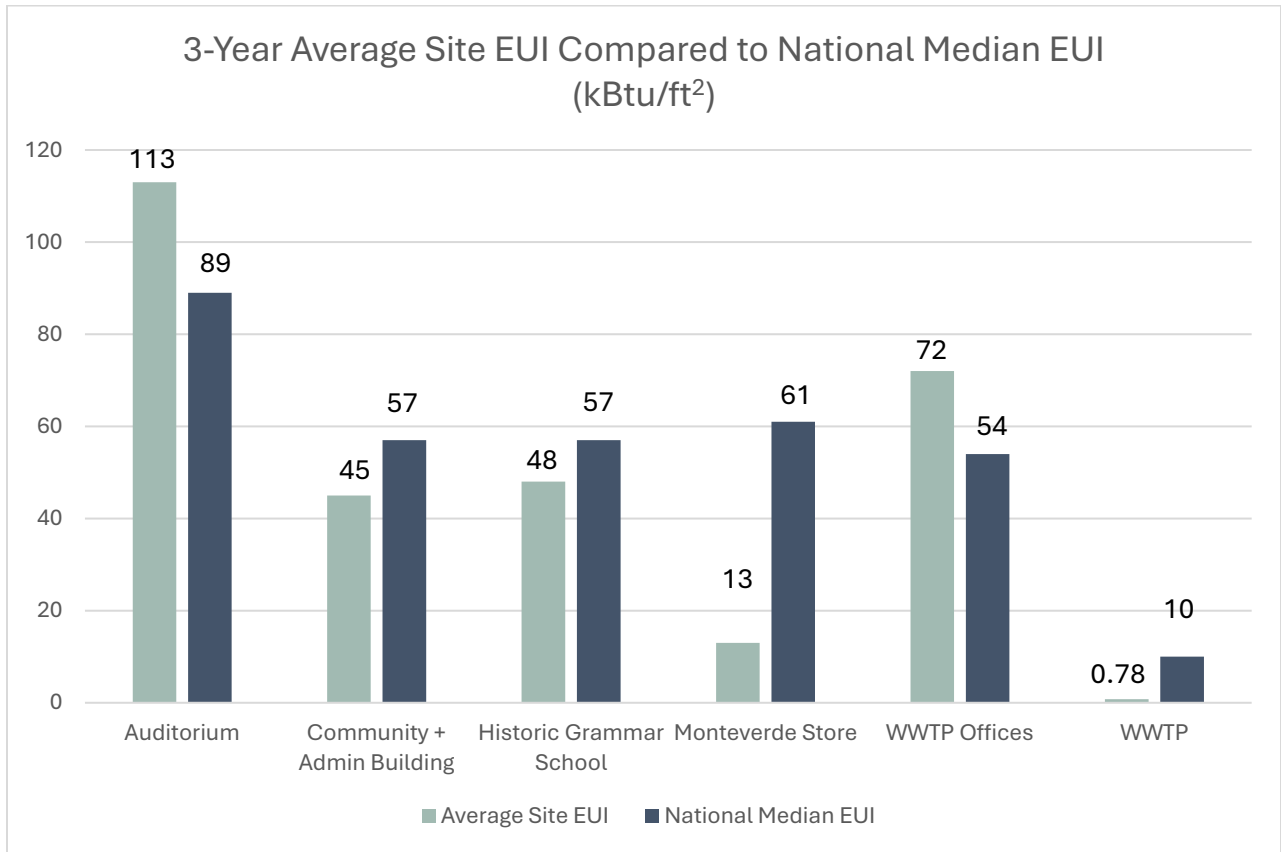


TABLE 1. SUMMARIZED RESULTS FROM BENCHMARKED FACILITIES

Building Name	Average Site EUI	National Median EUI	Average Yearly Electricity Cost	Average Yearly Natural Gas Cost	Avg. Yearly Total Energy Cost
Auditorium	113	89	\$36,637	\$4,571	\$41,207
Community Building + Administration Building ¹	45	57	\$7,548	\$2,711	\$10,259
Historic Grammar School	48	57	\$3,562	\$4,863	\$8,425
Monteverde Store	13	61	\$454	\$435	\$889

Building Name	Average Site EUI	National Median EUI	Average Yearly Electricity Cost	Average Yearly Natural Gas Cost	Avg. Yearly Total Energy Cost
Wastewater Treatment Plant Office	72	54	\$1,957	- ²	\$1,957
Wastewater Treatment Plant	0.78	10	\$19,721	- ²	\$19,721
Total	-	-	\$69,879	\$12,580	\$82,459

¹This summary includes combined electric data for the Administration Building and the Community Building because they share an electric account and cannot be analyzed individually for electricity.

²These facilities do not have natural gas data.

The results of the benchmarking analysis illustrate that there are opportunities to improve energy efficiency at Sutter Creek’s facilities. The facilities identified as the top candidates for future performance and cost savings are the Auditorium, the Historic Grammar School, the WWTP Offices, and the Community and Administration Building. These facilities were selected based on a combination of high energy use and costs, increasing energy usage and costs, and EUIs over the national median. An overview of each facility’s average annual gas costs, electricity costs, and EUI can be seen in **Table 1**.

The City’s first step should be conducting audits of all facilities to identify opportunities to increase efficiency. All facilities could be audited for energy efficiency to identify upgrades like HVAC, lighting, building envelope (insulation), and hot water heat pumps. If not already present, smart controls could also be installed in all facilities to optimize energy usage, ideally reducing usage during On-Peak hours of the day. Additionally, the city could provide energy education and guidance to staff and install retrofits with normal upgrade cycles to improve economic feasibility.

Introduction

Building energy benchmarking is a valuable tool used to evaluate energy and cost efficiency in facilities. Benchmarking involves analyzing building-specific energy consumption and cost data and comparing the results to historical data, similar buildings, or reference performance levels. The analysis can be used to determine opportunities to improve energy efficiency, reduce energy costs, and enhance building comfort and operation. This benchmarking report, conducted by Sierra Business Council (SBC) under the Sierra Nevada Energy Watch

(SNEW) program, measures the energy performance of the City of Sutter Creek’s buildings over time and compares Sutter Creek’s buildings to similar use facilities across the nation. The objective of the report is to help Sutter Creek better understand its building energy usage and assess opportunities for energy efficiency upgrades and building improvements. As SNEW is funded by Pacific Gas and Electric Company (PG&E), its benchmarking reports evaluate energy sources provided by PG&E. PG&E supplies electricity and natural gas to all Sutter Creek benchmarked facilities.

Energy Use Intensities (EUIs) are a measure of annual energy consumption per square foot. SNEW calculated EUIs and compared them against facilities with similar use (i.g. library, office, museum, etc.) and in the same climate zones to get an accurate comparison of energy use at each facility. Site EUI only accounts for energy that is consumed onsite to provide energy to each facility; it does not incorporate additional energy losses from production, transmission, and distribution.

The following sections provide an overview of the data, methods, and results of this analysis, along with recommendations and next steps for improving energy efficiency and reducing costs.

Data & Methods

SBC benchmarked six Sutter Creek facilities for this report. These facilities are listed in **Table 2** along with addresses, square footage, and the year each facility was built. The accuracy of any benchmarking analysis is dependent on the comprehensiveness of facility information. This report does not contain specific information about the age or specific types of systems or equipment that typically use the greatest amount of energy (e.g. water heating, air conditioning, or lighting). As a result, specific conclusions or recommendations for retrofits cannot be made from this report alone.

TABLE 2. BENCHMARKED BUILDINGS AND FACILITIES

Building Name	Address	Square Footage	Year Built
Auditorium	18 Main St, Sutter Creek, CA 95642	5,040	1928
Community Building ¹	33 Church St, Sutter Creek, CA 95642	3,370	2005
Administrative Building ¹	35 Church St, Sutter Creek, CA 95642	1,155	1880

Building Name	Address	Square Footage	Year Built
Historic Grammar School	111 Cole St, Sutter Creek, CA 95642	6,000	1856
Monteverde Store	11 Randolph St, Sutter Creek, CA 95642	1,600	1896
Wastewater Treatment Plant Offices	340 Mahoney Mill Rd, Sutter Creek, CA 95642	288	1994
Wastewater Treatment Plant	340 Mahoney Mill Rd, Sutter Creek, CA 95642	N/A	1948

¹The electric data for the Administrative Building is included in the data for the Community Building. Therefore, these buildings will mostly be analyzed together even though they are separate structures.

For the purposes of this report, the Administration Building and the Community Building were analyzed together in EUIs, electricity use, and electricity cost, because the Administration Building’s energy data is included in that of the Community Building. We do not have access to each facility’s electric data separately. However, each facility does have their own gas account and will be analyzed separately in the “Natural Gas Usage and Cost” section of the report.

PG&E provided energy usage and cost data for Sutter Creek facilities. Annual building energy usage and cost data were evaluated for the three-year period of January 2021 through December 2023. Benchmarking multiple years provides a more comprehensive picture of energy performance compared to analyzing a single year, as factors such as weather can vary significantly from year to year.

ENERGY STAR Portfolio Manager (ESPM), the industry-standard software for measuring and tracking energy performance, provided national median site EUI data for the building types analyzed (offices, social halls, gyms, museums, and wastewater treatment plants). Each Sutter Creek facility was compared to the 2022 median site EUI for the appropriate building type (**Table 3**). Median site EUIs are determined by location and climate zone. For this report, all facilities were compared to national medians in the same climate zone. Climate zones are defined by the 2021 International Energy Conservation Code (IECC), which groups locations by county based on climatic conditions in certain geographic regions. Sutter Creek lies in zone 4B, which is defined as a mixed dry climate.

TABLE 3. FACILITY CATEGORY FOR EUI COMPARISON

Sutter Creek Facility	Building Category for EUI Comparison
Auditorium	Fitness Center/Health Club/Gym
Community and Administration Buildings	Social/Meeting Hall
Historic Grammar School	Social/Meeting Hall
Monteverde Store	Museum
WWTP Offices	Office
Wastewater Treatment Plant	Wastewater Treatment Plant

It should be noted that the benchmarked years were closely following the COVID-19 pandemic, which may have created some irregularities in building hours of operation and energy use.

Summary of Site EUIs

Site EUIs were calculated for each Sutter Creek facility for three 12-month periods from January 2021 to December 2023. The average site EUIs and percent changes over the three-year period were also calculated for each facility. These results are displayed in **Table 4** and **Figure 2**.

As seen in **Figure 2** and **Table 4**, half of Sutter Creek facilities have been increasing in EUI over the past three years. This includes the Auditorium, Community and Administration Buildings, and the Historic Grammar School. The buildings with decreasing EUIs are the Monteverde Store, the WWTP Offices, and the WWTP. Additionally, only two of the facilities, the Auditorium and the WWTP Offices, are over the national median EUI. This indicates that most facilities are on par with energy use in similar buildings across the nation, but the Auditorium and the WWTP Offices could most benefit from energy reduction and upgrades.

The Historic Grammar School increased in EUI by 50% between 2021 and 2023, the Community and Administration Building increased by 26%, and the Auditorium increased by 4%. The WWTP offices decreased by 4%, the WWTP decreased by 29%, and the Monteverde store decreased by 90% (however, this facility was not being used regularly between 2022 and 2023).

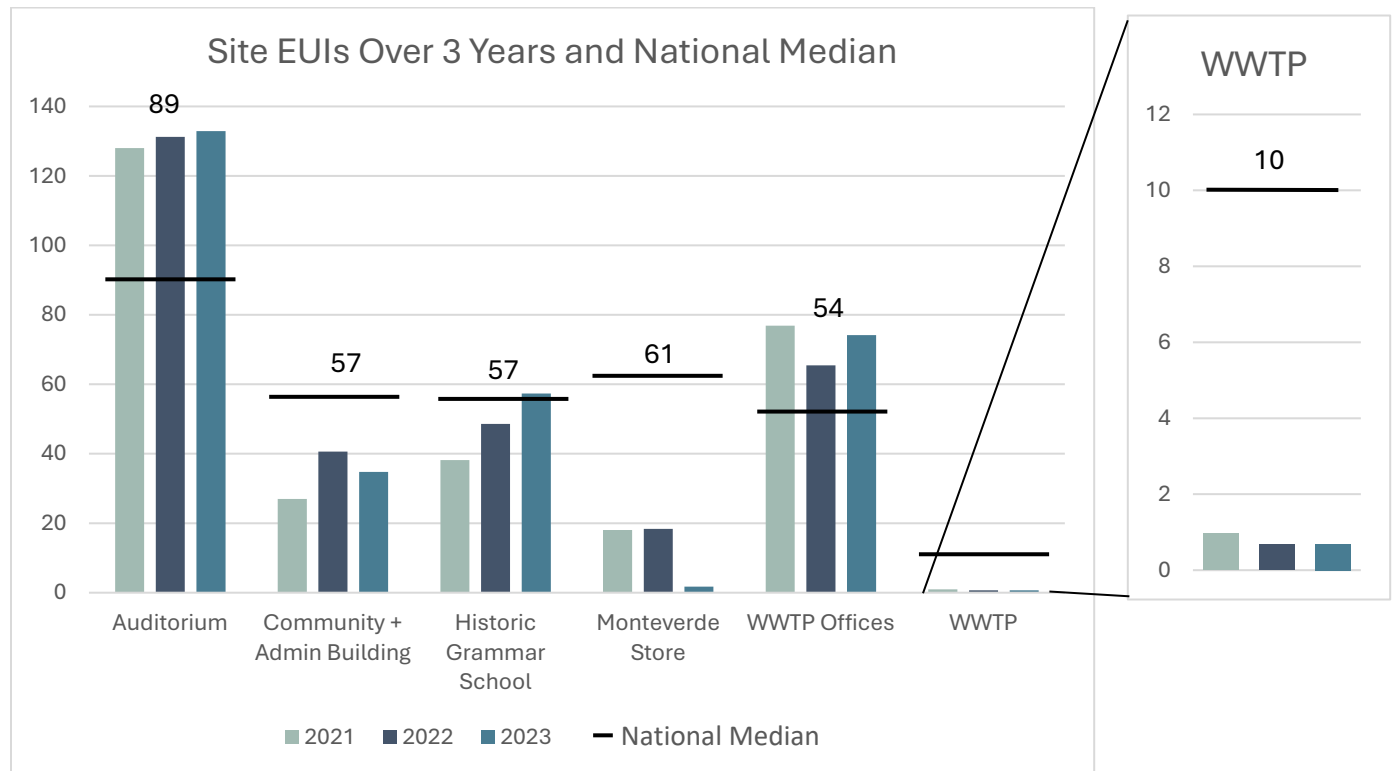
TABLE 4. SITE AND NATIONAL MEDIAN EUIS

Building	Site Energy Use Intensity (kBtu/sqft)					
	2021	2022	2023	3-Year Average	'21-'23 % Change	National Median EUI
Auditorium	111	114	115	113	+4%	89
Community and Administration Buildings	38	51	48	45	+27%	57
Historic Grammar School	38	49	57	48	+50%	57
Monteverde Store	18	18	2	13	-90% ¹	61
WWTP Offices	77	65	74	72	-4%	54
WWTP	0.97	0.68	0.69	0.78	-29%	10

¹This facility has not had regular use in recent years, therefore their EUI's and percentage change are skewed.

²Values shown in red represent average EUIS over the national median for a 4B climate zone.

FIGURE 2. SITE EIUs OVER 3 YEARS AND NATIONAL MEDIAN EUI



Electricity Usage and Costs

Electricity Usage

Total electricity usage by facility is shown in **Table 5** and **Figure 3**. **Table 5** also includes the three-year average and percent change over the period analyzed.

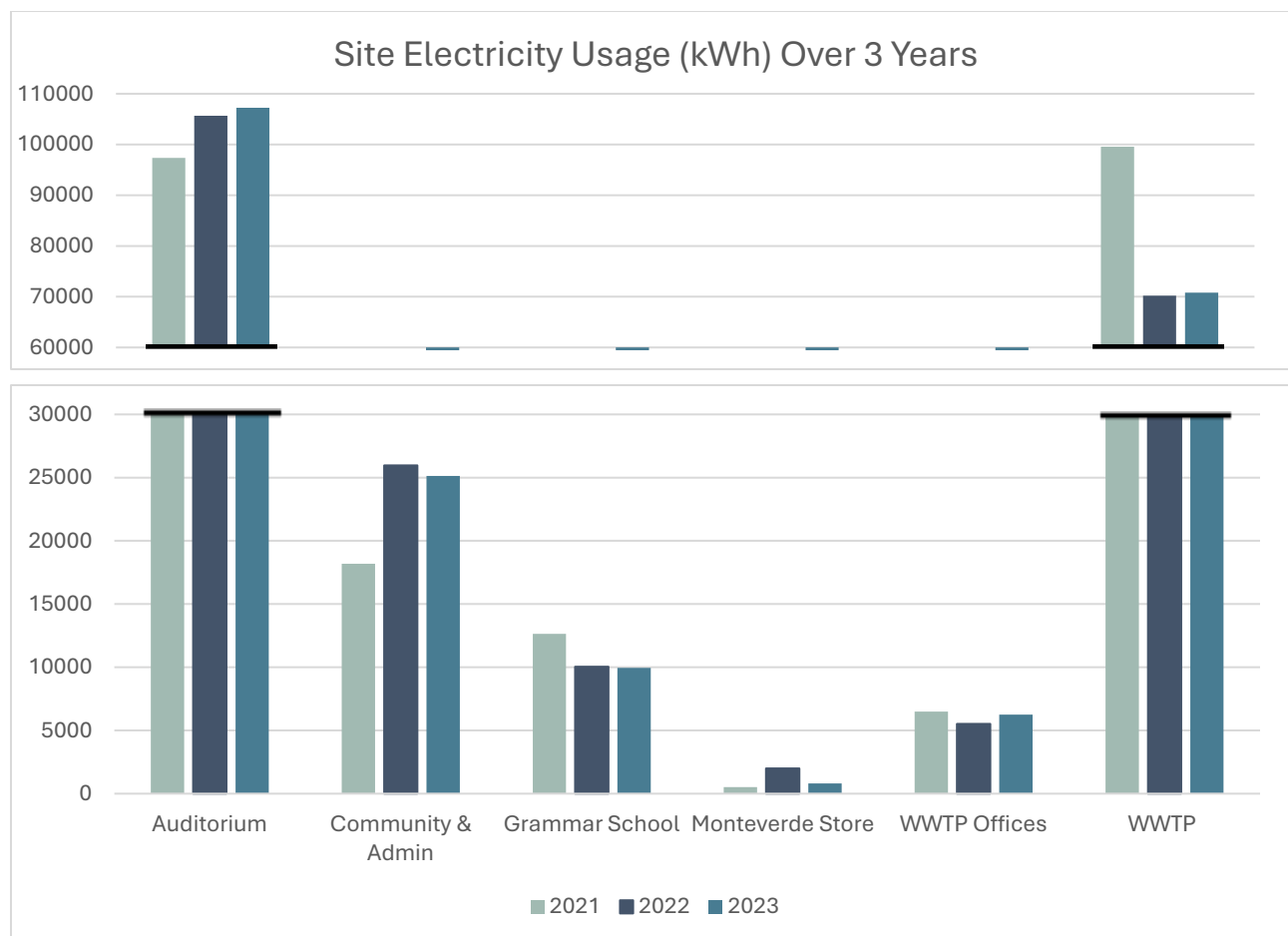
From 2021 to 2023, the Monteverde Store saw a 56% increase in electricity usage, the highest of any facility. At the Community and Administration Buildings, electricity usage increased by 38% and usage at the Auditorium increased by 10%. However, it's important to note that the Monteverde Store has not been used regularly in recent years, making it difficult to analyze energy trends and evaluate efficiency. More regular usage in the future will allow for more accurate analysis of energy trends at this facility. This facility also is the lowest energy user of all Sutter Creek's benchmarked facilities, and accounts for less than 1% of the City's total annual electricity use. The Community and Administration Buildings, the Auditorium, and the WWTP have a much larger impact on Sutter Creek's total energy usage, as they account for 10%, 46%, and 36% of city energy usage, respectively.

A few facilities showed a decrease in electricity usage over three years: the Wastewater Treatment Plant (-29%), the Historic Grammar School (-21%), and the WWTP Offices (-4%). Overall, the City saw an average decrease of 6% across all benchmarked facilities from 2021-2023. However, the WWTP is an outlier in this data as it has not had consistent usage between 2021 and 2023. In 2021, the aerator and recirculation pumps broke and have not been used since. These components are awaiting repair, but without them the facility seems to be getting more efficient over time. When these components are repaired and in use, the WWTP is expected to show numbers more consistent with 2021. If the WWTP had regular usage over the three years, or if we discount it all together, the City would have seen an increase of 11% in electricity use from 2021 to 2023.

TABLE 5. TOTAL ELECTRICITY USAGE

Building	Electricity Usage (kWh)				
	2021	2022	2023	3-Year Average	'21-'23 % Change
Auditorium	97,349	105,677	107,243	103,423	+10%
Community and Administration Buildings	18,192	25,968	25,137	23,099	+38%
Historic Grammar School	12,640	10,038	9,958	10,879	-21%
Monteverde Store	522	1,992	812	1,109	+56%
WWPT Offices	6,489	5,524	6,258	6,090	-4%
WWTP	99,563	70,193	70,788	80,181	-29%
Total	234,755	219,392	220,196	224,781	-6%

FIGURE 3. TOTAL ELECTRICITY USAGE BY FACILITY



Electricity Costs

The facilities with the largest increase in electricity cost over three years were the Community and Administration Building (76%), the Monteverde Store (59%), and the Auditorium (38%) (**Table 6** and **Figure 4**). Even though the Wastewater Treatment Plant Offices had decrease in usage (**Table 5**), their costs increased by 27% due to electricity rate increases. Two facilities saw a decrease in electricity costs over three years: the Historic Grammar School (-2%) and the WWTP (-14%).

The facilities with the highest yearly electricity costs are the Auditorium, with an average cost of \$36,637, and the WWTP, with an average cost of \$19,721. Together, these two facilities account for 81% of Sutter Creek’s total electricity costs. Overall, Sutter Creek’s benchmarked

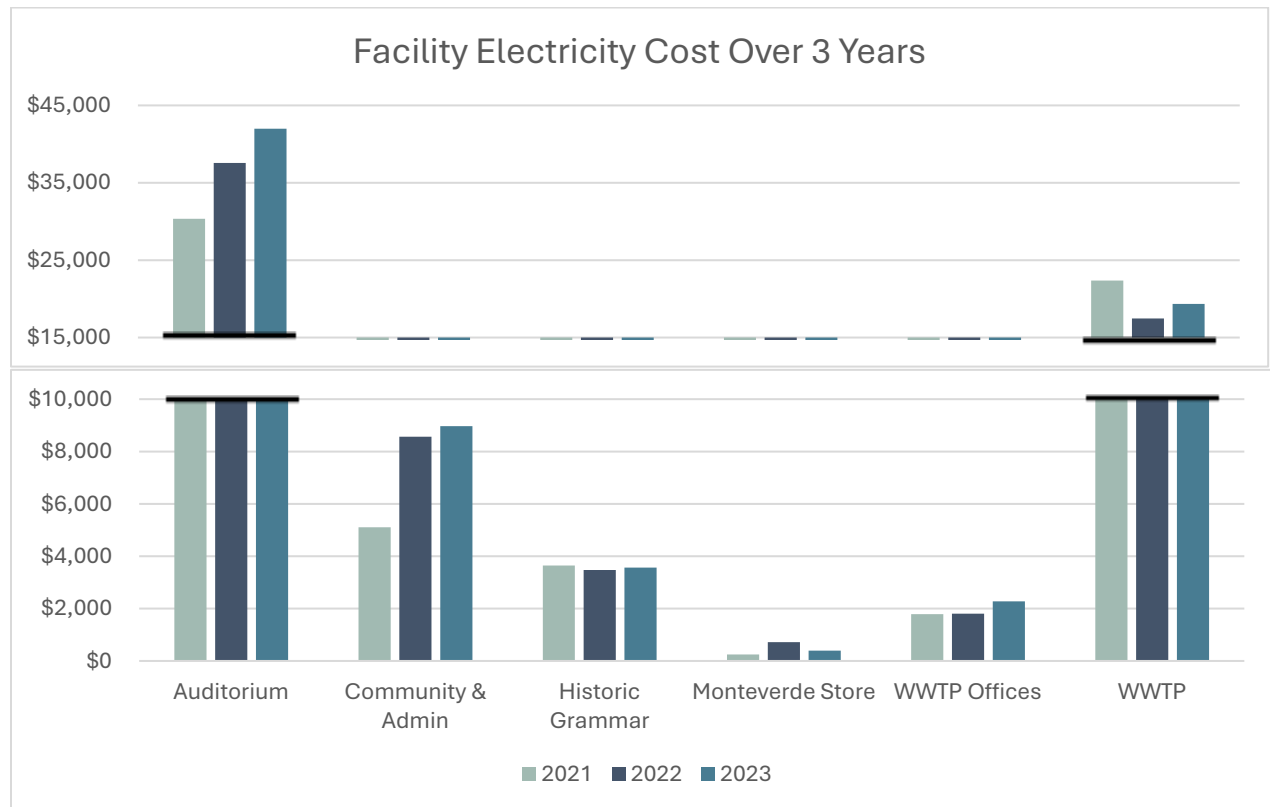
facilities saw an average increase of 21% in their electricity bills, costing the City \$13,036 more in 2023 compared to 2021.

The WWTP’s 3-year change should be evaluated with additional factors in mind. In 2021, the facility was performing at a normal standard with all pieces of equipment working. In 2022, the aerator and recirculation pumps broke or have been turned off for repair and were not used at all between 2022 and 2023. This caused a large down spike in energy usage that gives a false image of how the plant is performing over time. Discounting this facility on city-wide trends, there is an increase of 43% in electricity costs over three years.

TABLE 6. ELECTRICITY COSTS

Building	Electricity Costs (\$)				
	2021	2022	2023	3-Year Average	'21-'23 % Change
Auditorium	\$30,348	\$37,571	\$41,991	\$36,637	+38%
Community and Administration Building	\$5,109	\$8,563	\$8,970	\$7,547	+76%
Historic Grammar School	\$3,643	\$3,477	\$3,566	\$3,562	-2%
Monteverde Store	\$250	\$716	\$397	\$454	+59%
WWTP Offices	\$1,789	\$1,806	\$2,278	\$1,958	+27%
WWTP	\$22,364	\$17,462	\$19,337	\$19,721	-14%
Total	\$63,503	\$69,595	\$76,539	\$69,879	+21%

FIGURE 4. ELECTRICITY COSTS BY FACILITY



Natural Gas Usage and Costs

Natural Gas Usage

Natural Gas usage by facility is shown in **Table 7** and **Figure 5**. The Community and Administration Buildings are being analyzed separately in this section of the report as they each have their own natural gas accounts.

Natural gas usage increased in three facilities. Usage increased by 19% in the Community Building, 22% in the Administration Building, and 67% in the Historic Grammar School. The Auditorium decreased by 7%. The largest user of natural gas was the Historic Grammar School, at over 2,500 therms of usage per year and accounted for 40% of Sutter Creek’s total average annual natural gas usage. The Auditorium was a close second at 2,365 therms, accounting for 38% of the total usage. Together, these two facilities accounted for 77% of Sutter Creek’s average annual natural gas usage. Over three years, Sutter Creek saw an overall increase of 18% in natural gas usage from 2021 to 2023, costing \$1,026 more in 2023 than in 2021.

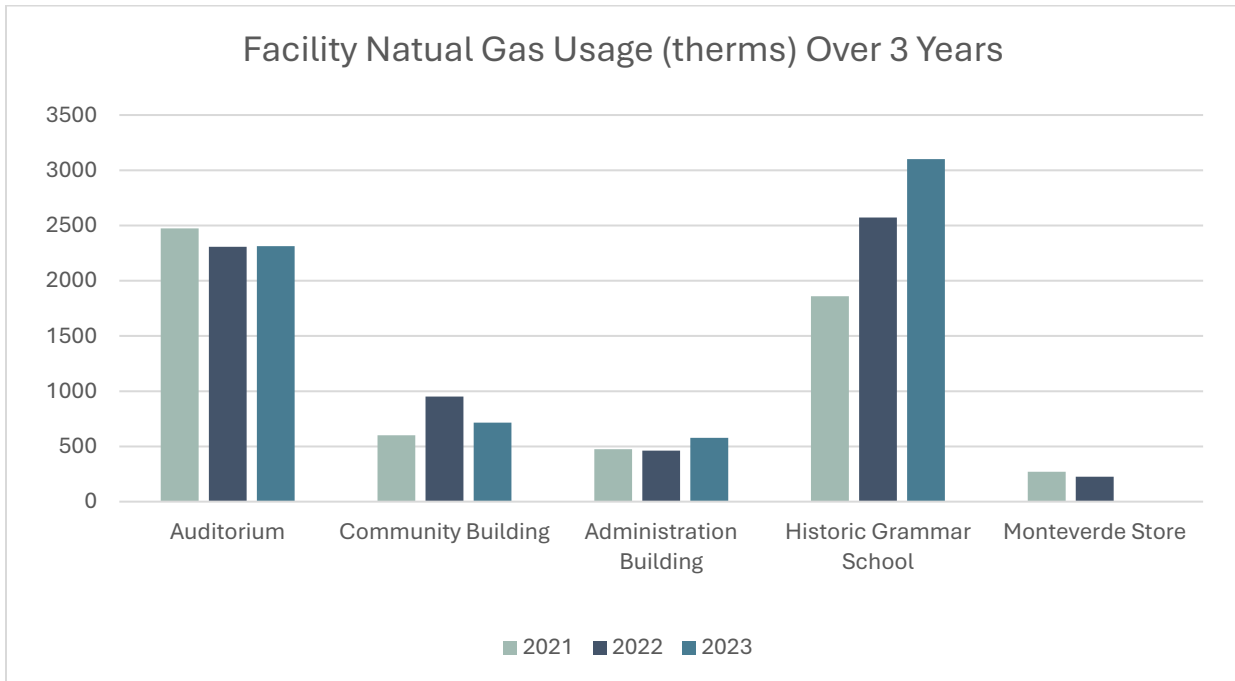
TABLE 7. NATURAL GAS USAGE

Building	Natural Gas Usage (therms)				
	2021	2022	2023	3-Year Average	'21-'23 % Change
Auditorium	2,474	2,307	2,313	2,365	-7%
Community Building	601	952	716	756	+19%
Administration Building	475	462	577	505	+22%
Historic Grammar School	1,860	2,573	3,101	2,511	+67%
Monteverde Store	271	226	0	166	- ¹
WWTP Offices ²	-	-	-	-	-
WWTP ²	-	-	-	-	-
Total	5,681	6,520	6,707	6,303	+18%

¹Cannot calculate percentage change with a zero value.

²No natural gas data for these facilities.

FIGURE 5. NATURAL GAS USAGE BY FACILITY



Natural Gas Costs

Natural gas costs across all facilities are shown in **Table 8** and **Figure 6**. The facility with the highest natural gas cost is the Historic Grammar School, at an average of \$4,863 per year. The Auditorium is about the same, costing an average of \$4,571 per year. These two facilities account for 75% of total natural gas costs per year. All facilities saw a significant increase in natural gas costs, except for the Monteverde Store.

Natural gas rates are increasing across the country, which is why gas costs are increasing at a much higher rate than usage at Sutter Creek’s facilities. For example, the Historic Grammar School gas usage increased by 67% (**Table 7**), while the costs increased by 118%. Overall, Sutter Creek saw a 56% increase in natural gas costs from 2021 to 2023.

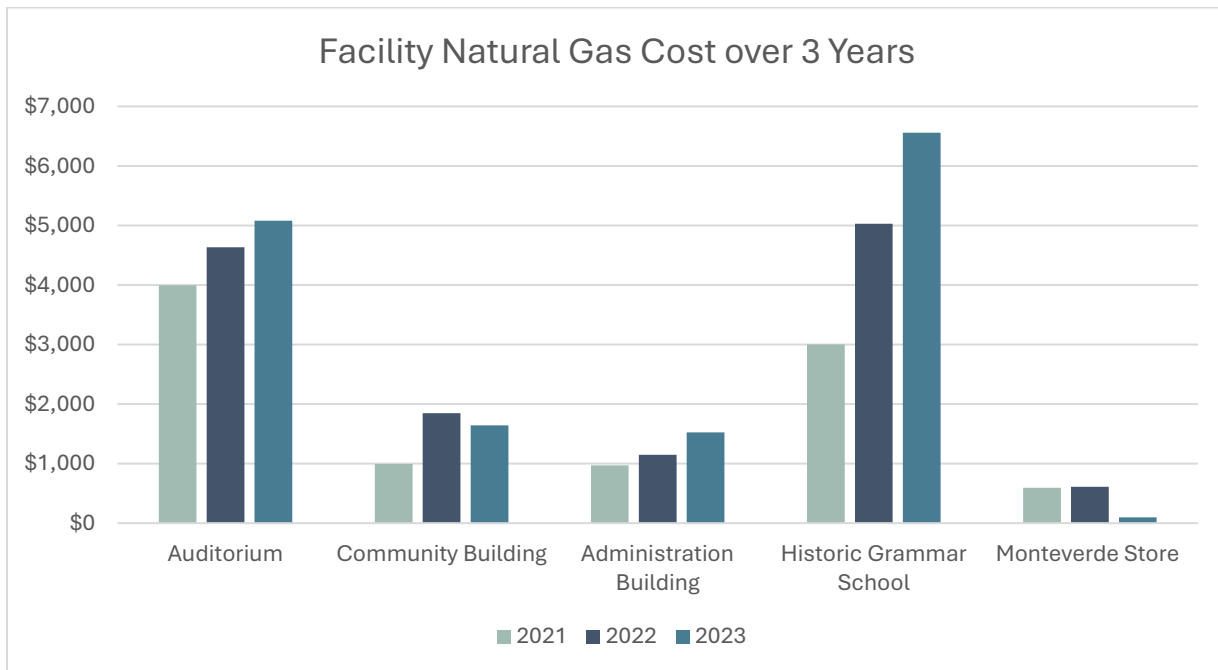
TABLE 8. NATURAL GAS COSTS

Building	Natural Gas Costs (\$)				
	2021	2022	2023	3-Year Average	‘21-’23 % Change
Auditorium	\$3,996	\$4,635	\$5,081	\$4,571	+27%
Community Building	\$995	\$1,848	\$1,642	\$1,495	+65%
Administration Building	\$972	\$1,150	\$1,526	\$1,216	+57%
Historic Grammar School	\$3,003	\$5,028	\$6,559	\$4,863	+118%
Monteverde Store	\$595	\$611	\$99	\$435	-83% ¹
WWTP Office	_2	_2	_2	_2	_2
WWTP	_2	_2	_2	_2	_2
Total	\$9,561	\$13,272	\$14,907	\$12,580	+56%

¹This facility’s gas costs reflect irregular usage throughout 2021-2023.

²No natural gas data for these facilities.

FIGURE 6. NATURAL GAS COSTS BY FACILITY



Trends by Facility

The following sections depict and discuss electricity and natural gas usage and costs at the benchmarked facilities from 2021 to 2023. For each facility, the first figure (Xa) illustrates TOU data (displaying peak-type usage) and monthly cost data for PG&E-supplied electricity. With a TOU rate schedule, prices are higher during peak hours (4 pm - 9 pm) and lower during all other times of the day. More information regarding TOU rates and PG&E’s Peak Day Pricing¹ plan can be found in **Appendix A**¹. The second graph (Xb) only showcases the electricity consumption per facility, as an area graph, to provide a digestible profile of electricity use trends over time for that facility. Natural gas usage and cost trends are included in the third graph (Xc). These three figures can help the City of Sutter Creek investigate and identify opportunities to implement energy efficiency measures, as well as shift usage times to reduce energy costs.

¹[PG&E Peak Day Pricing](#)

Auditorium

FIGURE 7A. TIME OF USE ELECTRICITY USE AND COST FOR THE AUDITORIUM

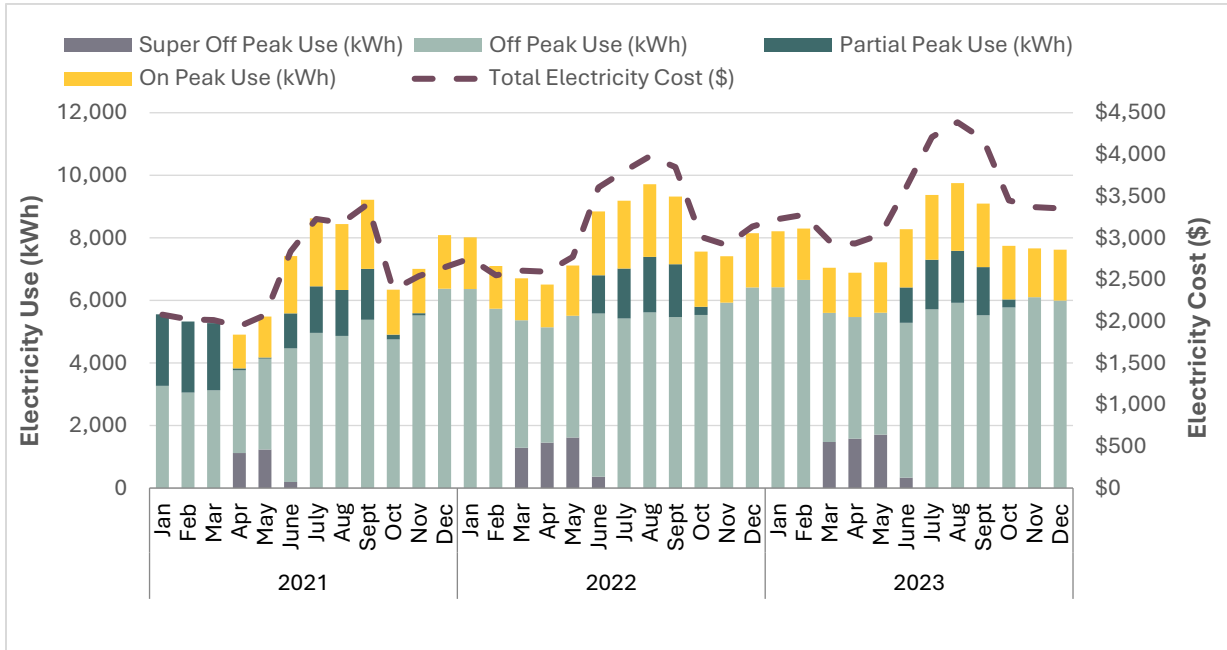


FIGURE 7B. TOTAL ELECTRICITY USE FOR THE AUDITORIUM

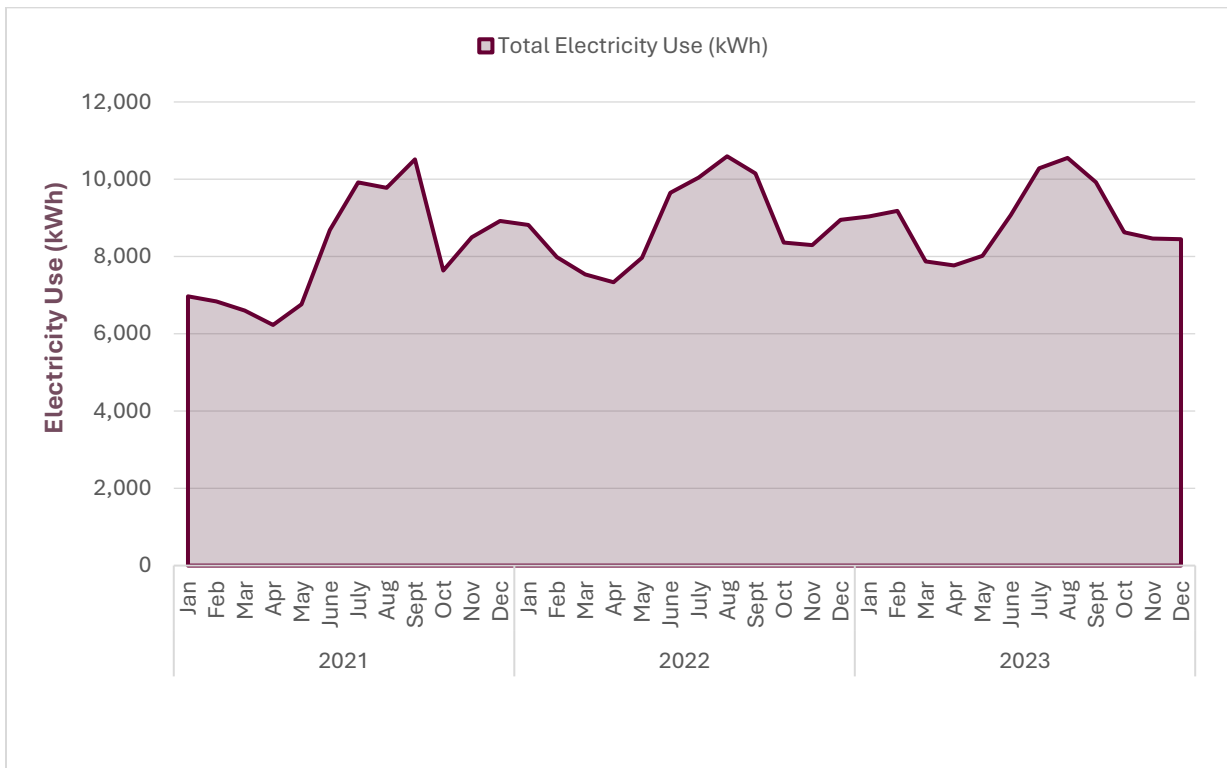
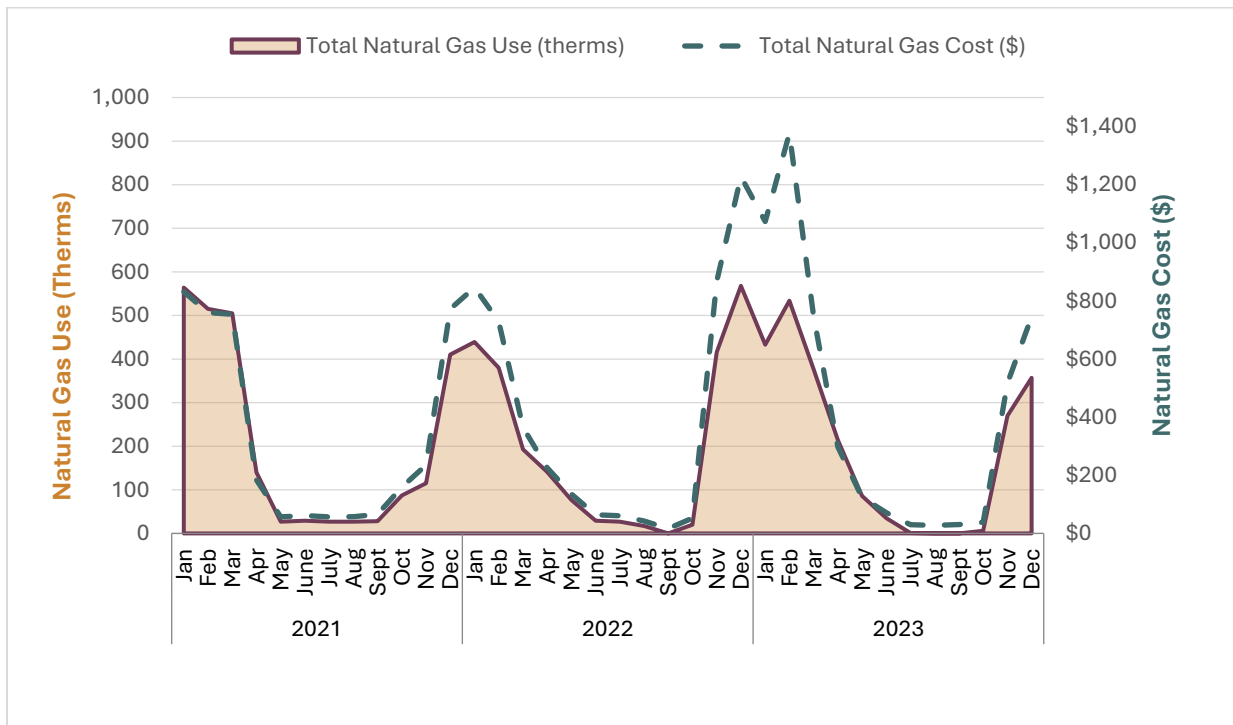


FIGURE 7c. NATURAL GAS USE AND COST FOR THE AUDITORIUM BUILDING



Key Takeaways

- **Figure 7a** and **Figure 7b** show that electric usage and costs are typically highest June through September each year, likely due to the use of air conditioning. The City also sees electric use during “Partial Peak” times. Partial-Peak rates are the second highest electricity price per kWh and are only implemented in summer months at the book ends of “On Peak” hours. This also contributes to high summer electricity costs.
- It’s evident that electricity rates are increasing over time as the gap between the cost line and the usage widens (**Figure 7a**).
- This facility uses more natural gas in the winter months, between November and March each year (**Figure 7c**). This is likely due to the use of space and water heating equipment. The Auditorium likely begins using heating systems between October and November and turns them off around May.
- This facility is also affected by increasing natural gas rates, as evident in **Figure 7c**, by the higher increase in cost each year compared to usage.

Community and Administration Buildings

FIGURE 8A. TIME OF USE ELECTRICITY USE AND COST FOR THE COMMUNITY AND ADMINISTRATION BUILDINGS

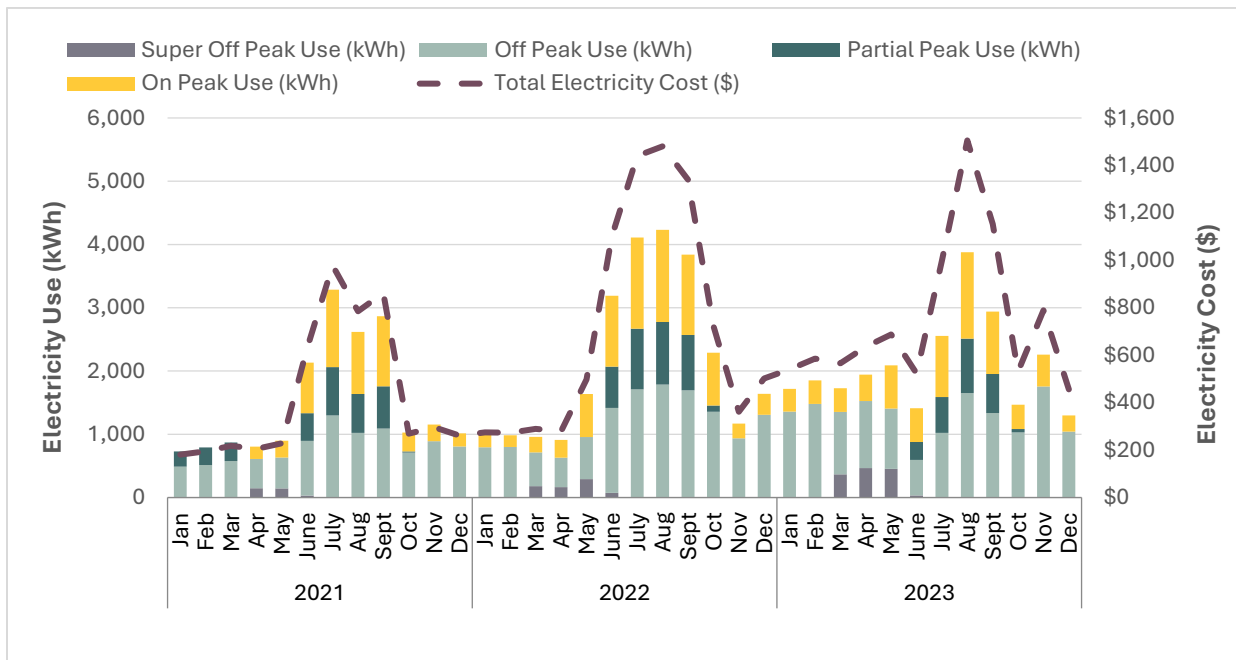


FIGURE 8B. TOTAL ELECTRICITY USE THE COMMUNITY AND ADMINISTRATION BUILDINGS

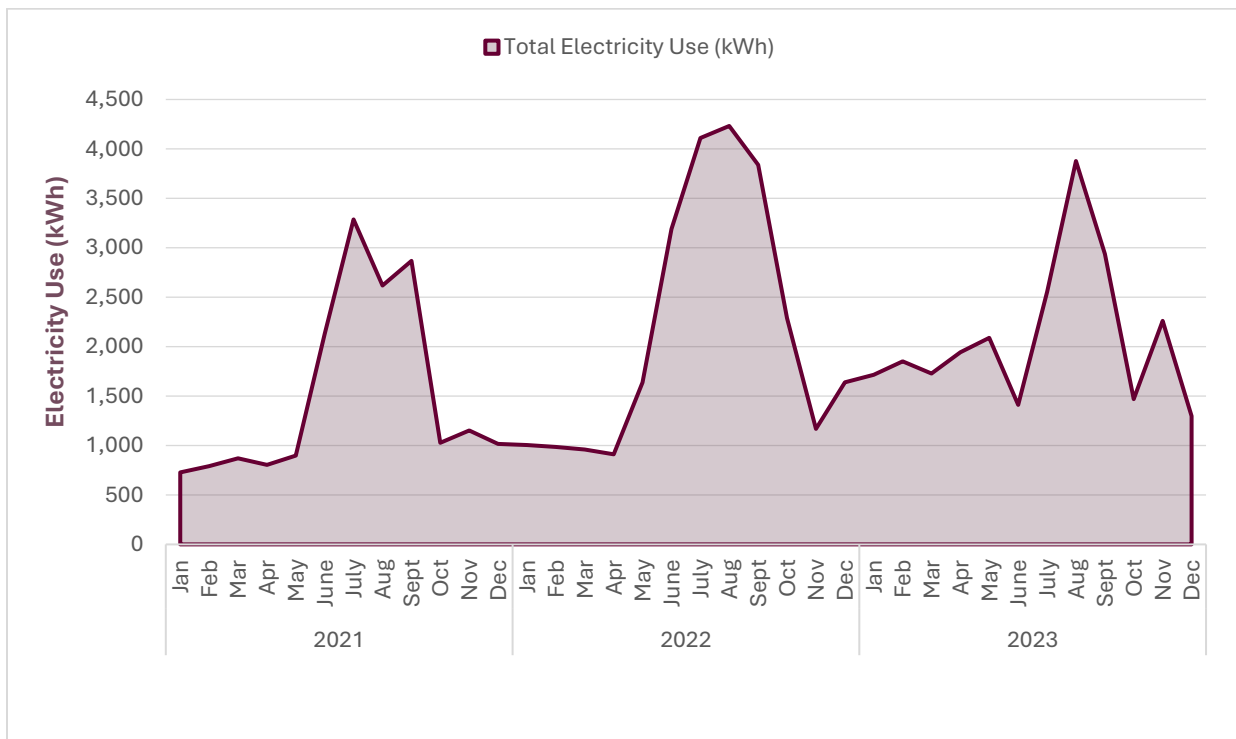
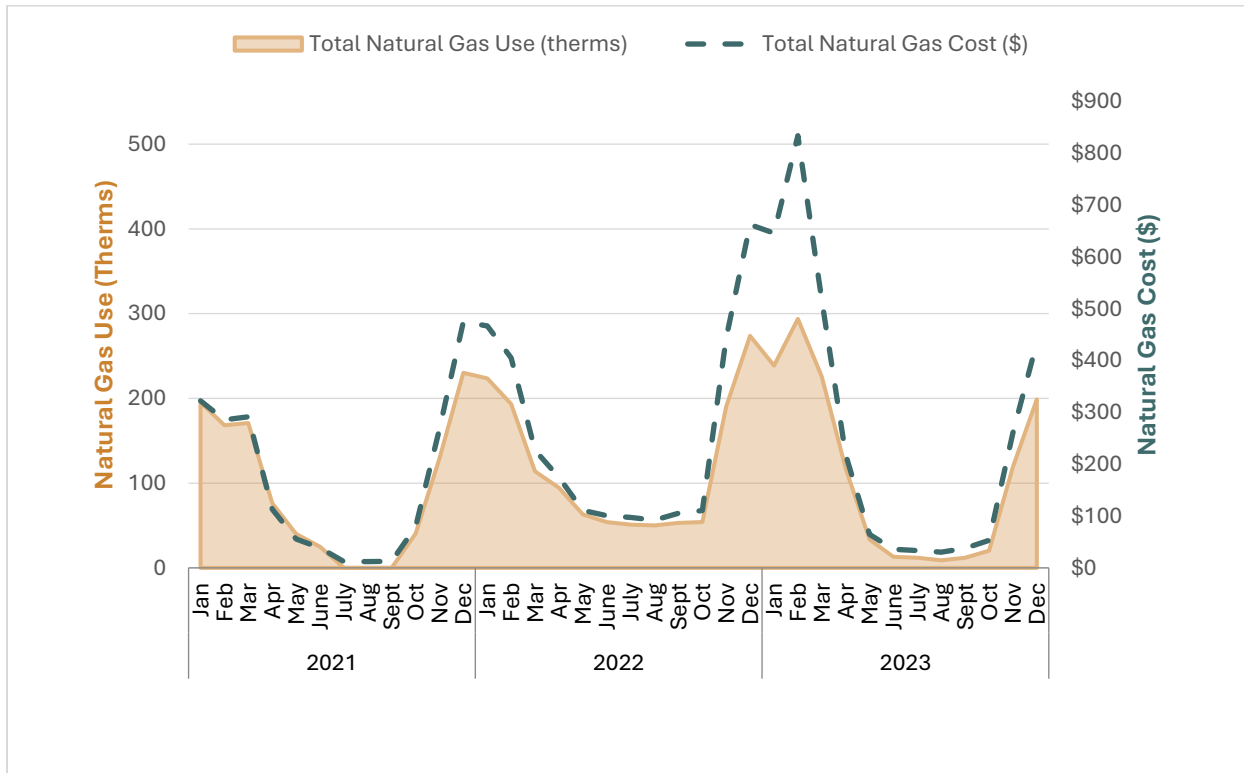
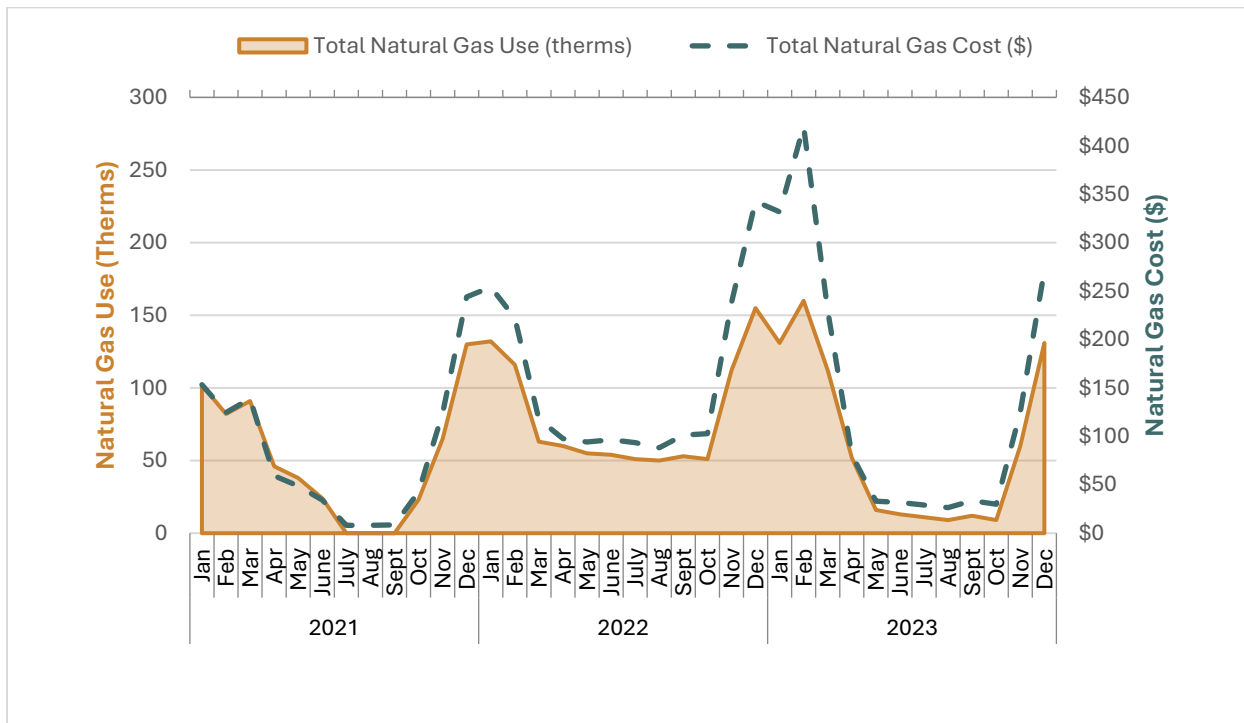


FIGURE 8C. TOTAL ELECTRICITY USE AND COST FOR THE COMMUNITY AND ADMINISTRATION BUILDINGS



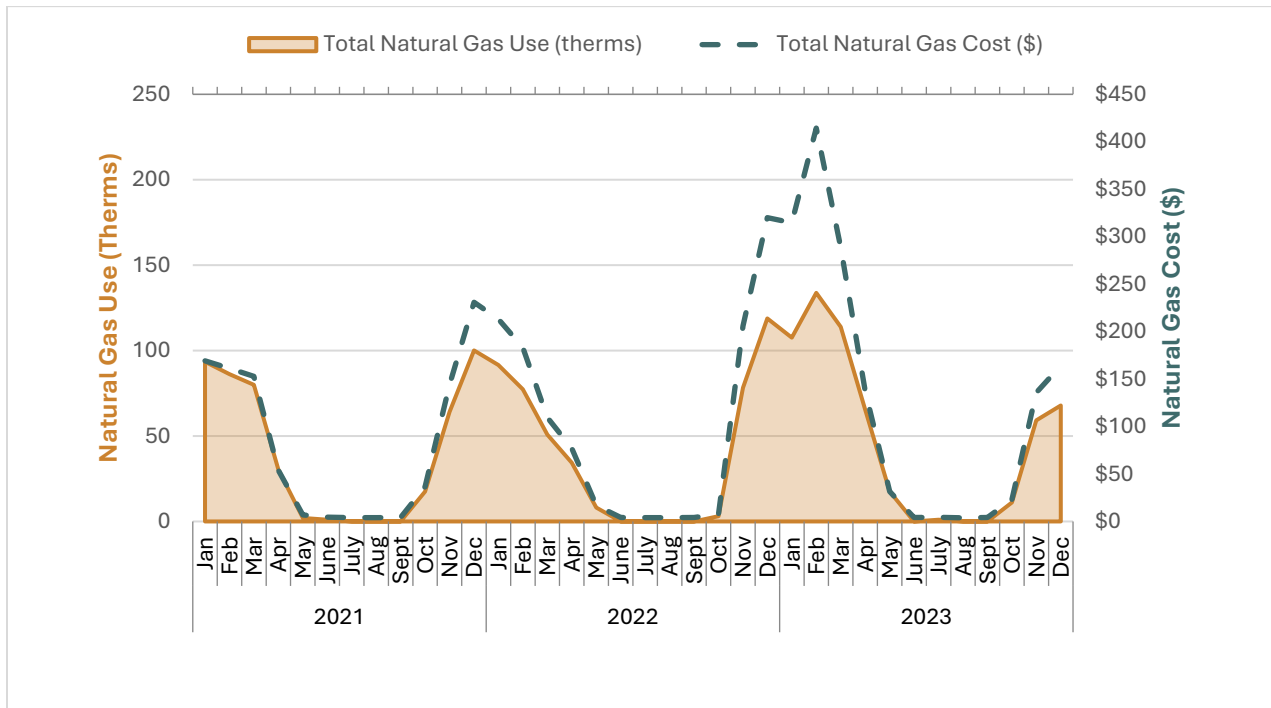
Community Building Natural Gas

FIGURE 9. NATURAL GAS USE AND COST FOR THE COMMUNITY BUILDING



Administration Building Natural Gas

FIGURE 10. NATURAL GAS USE AND COST FOR THE ADMINISTRATION BUILDING



The Community and Administration Buildings are analyzed together in **Figures 8a-8c** because they share an electric account. However, **Figure 9** and **Figure 10** show the gas usage and cost for each building individually.

Key Takeaways

- Electricity usage and costs are typically highest in the summer months of June through September likely due to the use of space cooling equipment (**Figure 8a** and **8b**). Electricity costs were highest in the summer of 2022.
- The highest monthly electricity costs were in August of 2022 and 2023, reaching about \$1,500.
- Natural gas usage for both facilities follows a similar pattern of increasing each year (**Figure 8c**, **Figure 9**, and **Figure 10**), and both show similar peak costs in the wintertime when heating equipment is likely being used. The highest natural gas costs were in the winter of 2022-2023 and both hit a maximum around \$420.
- The Community Building had a significant amount of natural gas usage through the summer of 2022, while the Administration Building did not use any natural gas between June and September of 2022 (**Figure 9** and **Figure 10**).
- Both natural gas and electricity rates are increasing and can be visualized in the cost line in all graphs (**Figure 8a-10**).

Historic Grammar School

FIGURE 11A. TIME OF USE ELECTRICITY USE AND COST FOR THE HISTORIC GRAMMAR SCHOOL

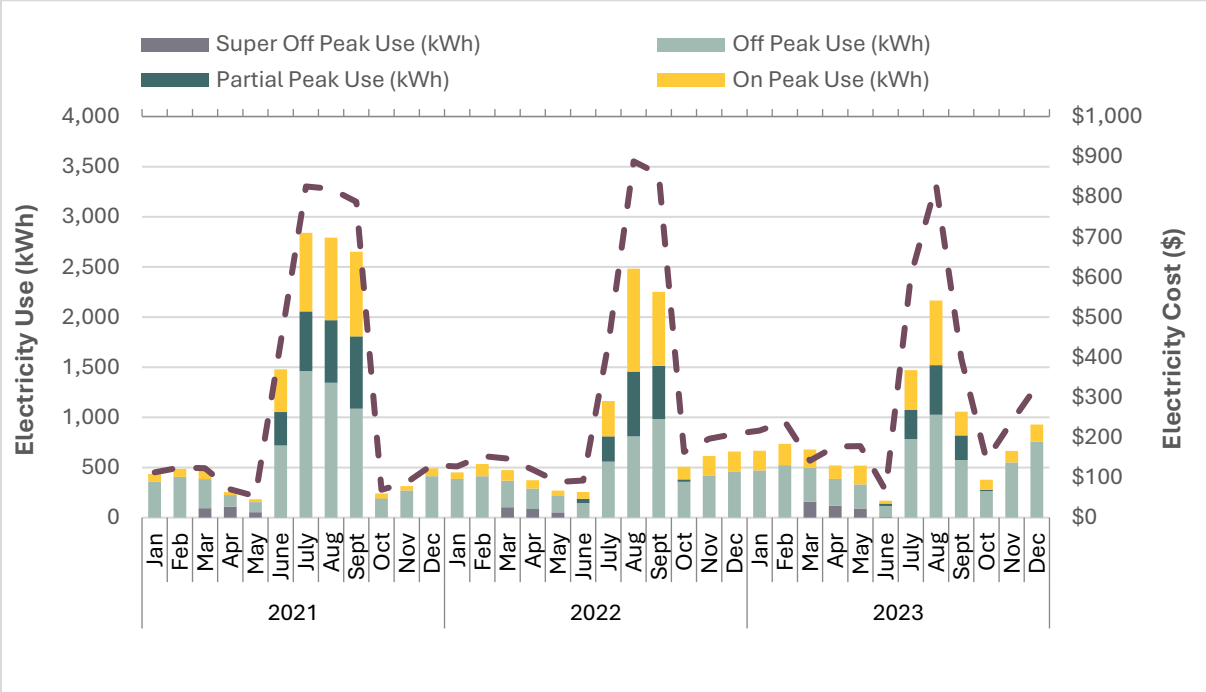


FIGURE 11B. TOTAL ELECTRICITY USAGE FOR THE HISTORIC GRAMMAR SCHOOL

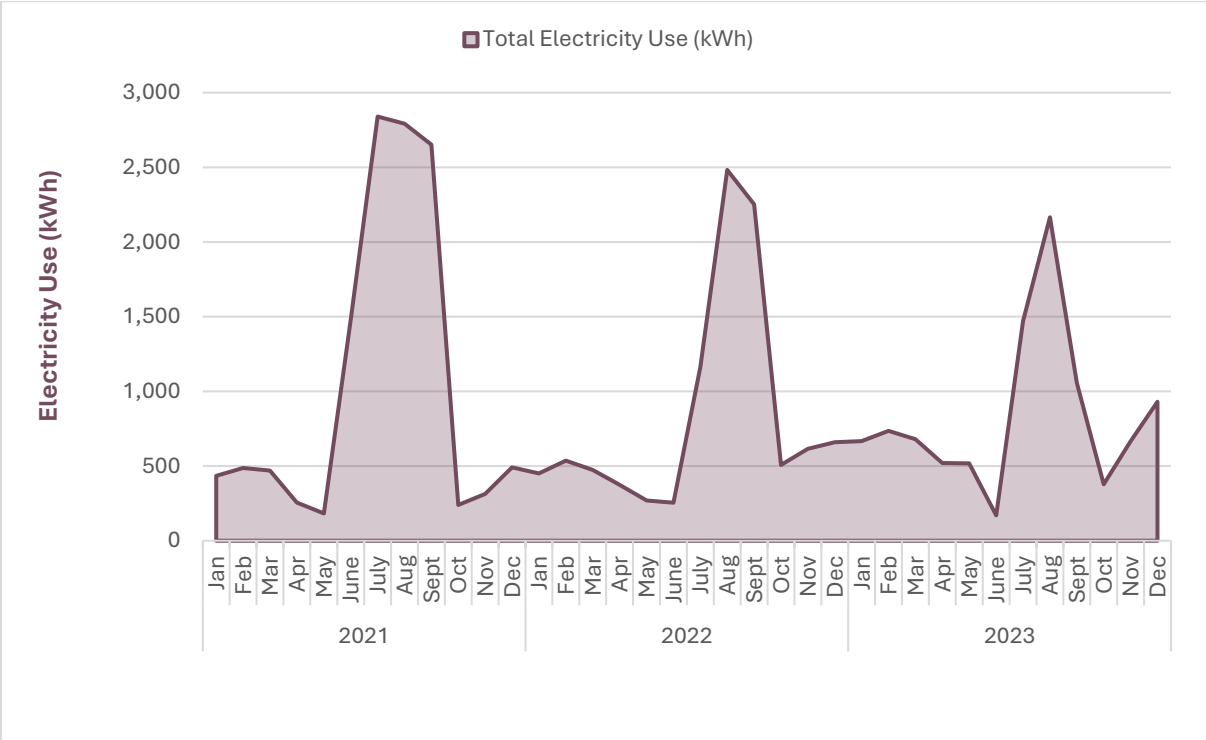
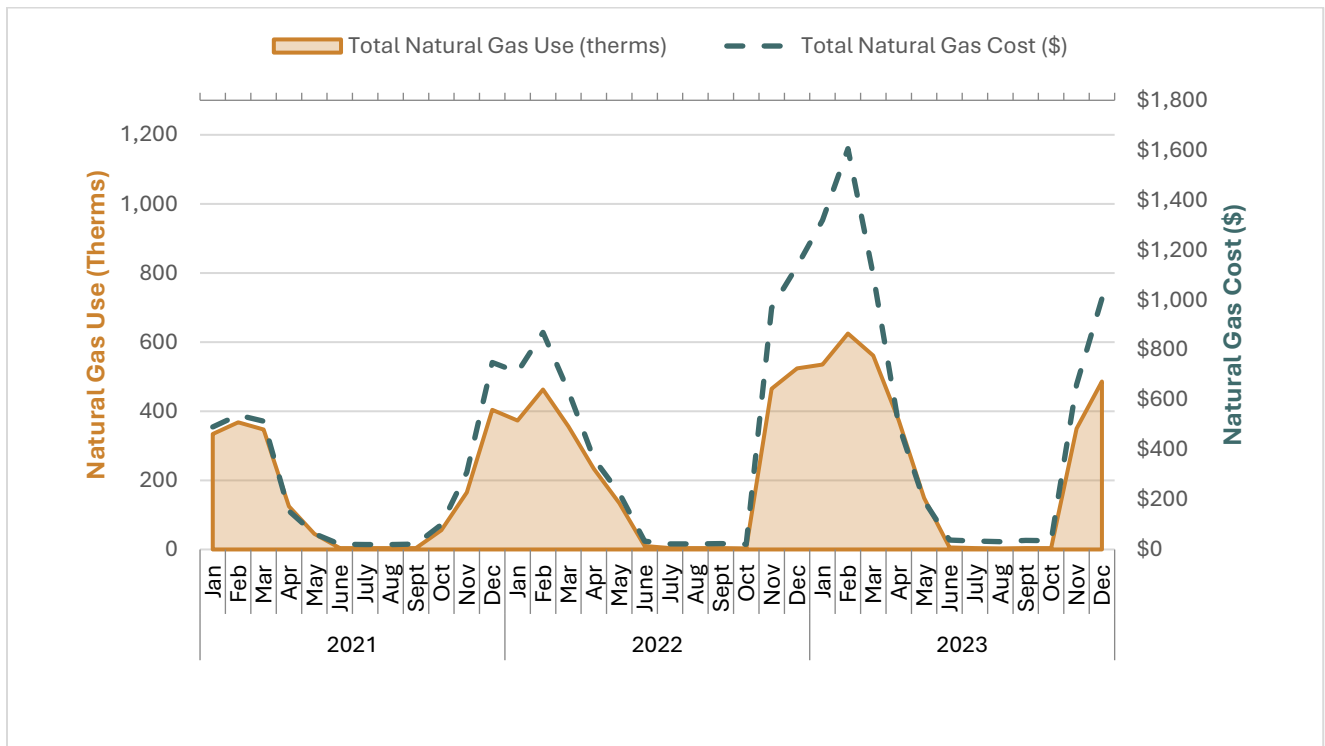


FIGURE 11C. NATURAL GAS USE AND COST FOR THE HISTORIC GRAMMAR SCHOOL



Key Takeaways

- Electricity usage and costs for the Historic Grammar School are highest in the summer months between June and September, reaching a maximum cost around \$850 each year (**Figure 11a** and **Figure 11b**).
- During June through September, this facility’s electric costs are highest due to their On-Peak (yellow) and Partial Peak (dark green) usage in **Figure 11a**.
- Natural gas usage is increasing for this facility (**Figure 11c**). While usage is increasing each winter, costs are increasing at a disproportionate amount due to increasing natural gas rates (**Figure 11c**).
- This facility’s natural gas costs increased from a monthly maximum of around \$530 in the winter of 2021 to a maximum over \$1,600 in the winter of 2023 (**Figure 11c**).

Monteverde Store

FIGURE 12A. TIME OF USE ELECTRICITY USE AND COST FOR THE MONTEVERDE STORE

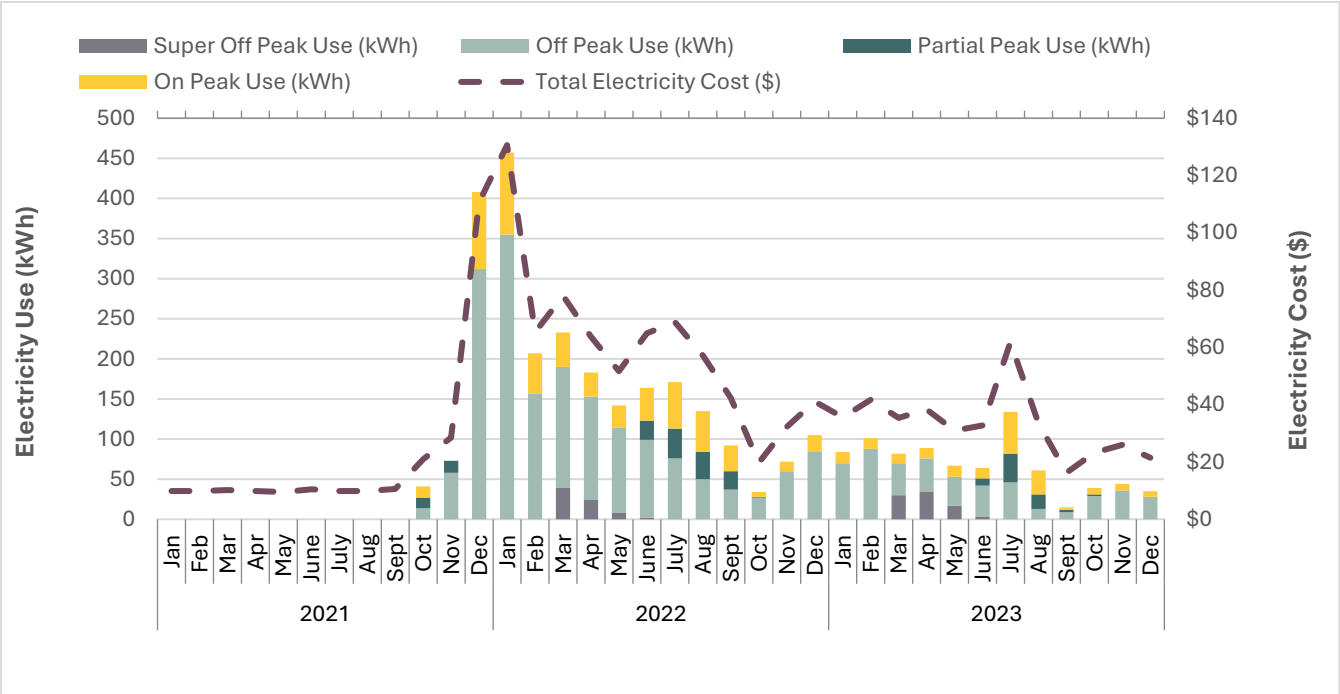


FIGURE 12B. TOTAL ELECTRICITY USE FOR THE MONTEVERDE STORE

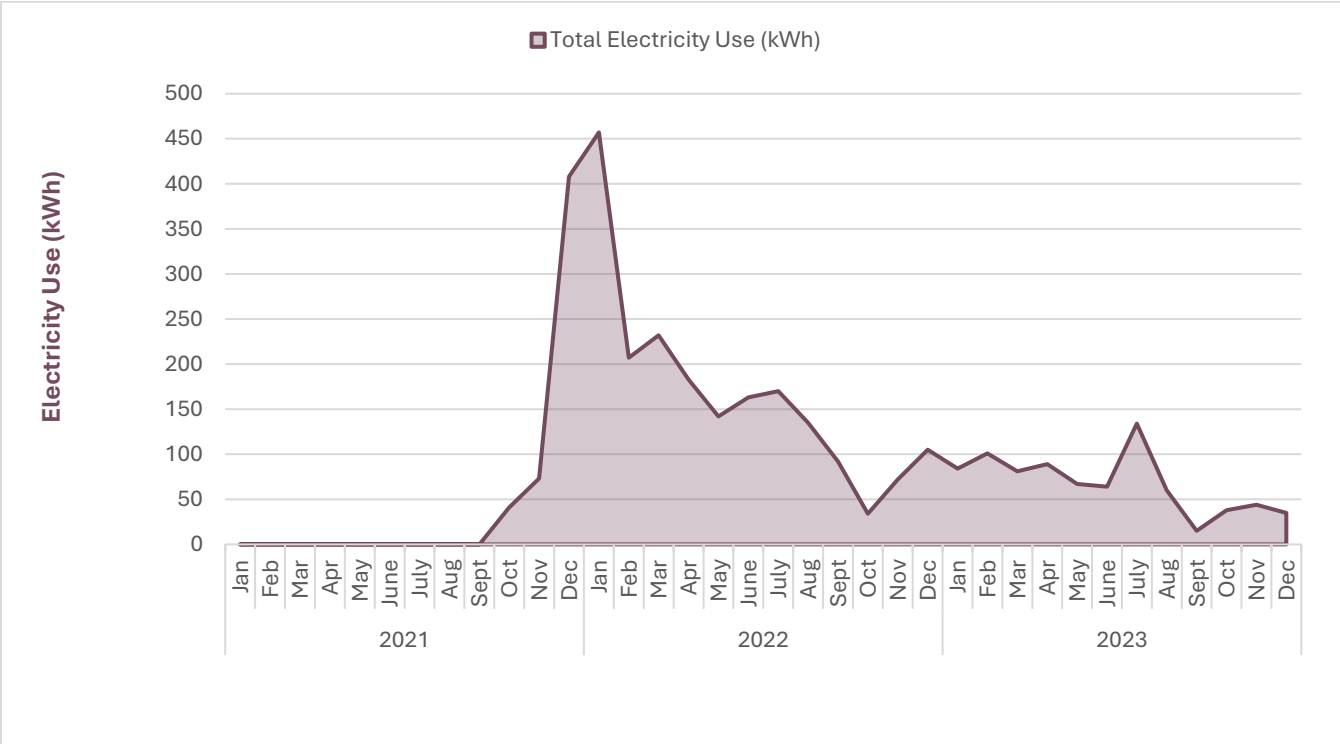
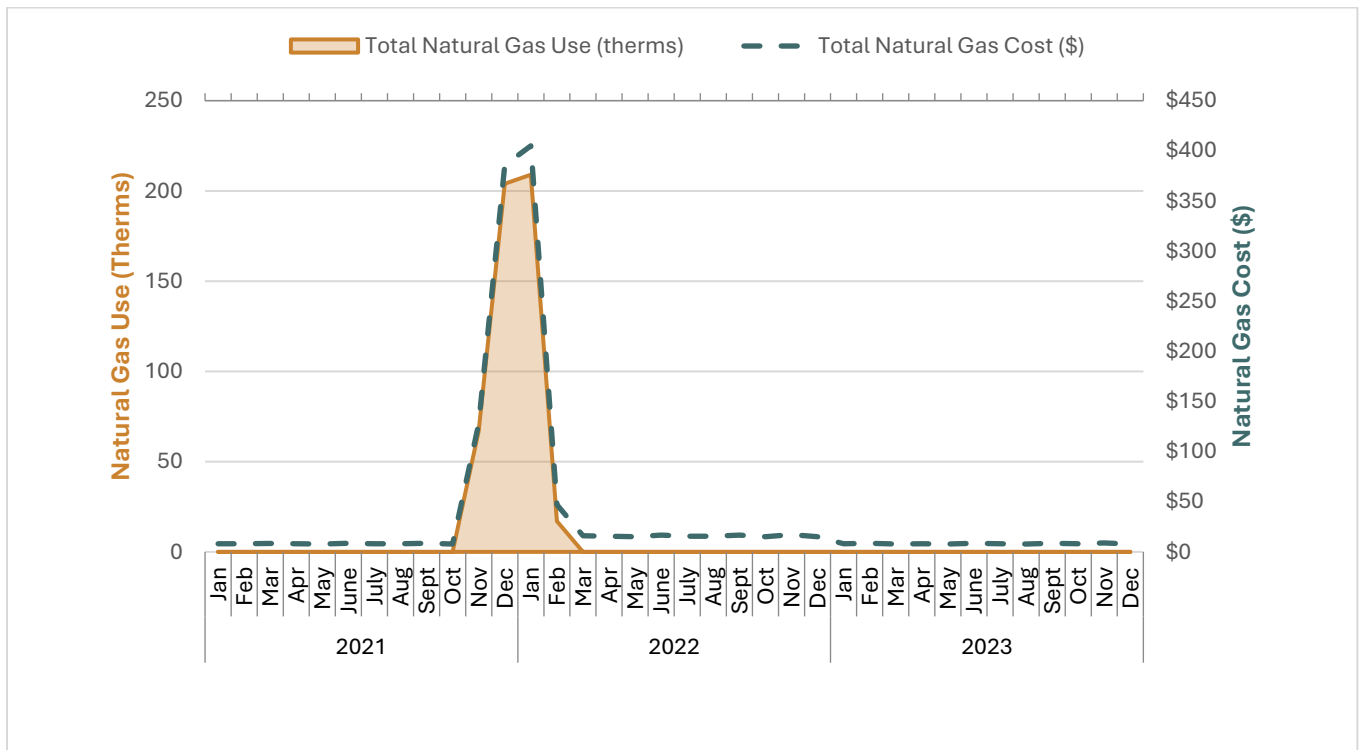


FIGURE 12c. NATURAL GAS USE AND COST FOR THE MONTEVERDE STORE



Key Takeaways

- The Monteverde Store has irregular gas and electric usage compared to other facilities benchmarked for Sutter Creek. This facility has not been used consistently but will likely be better utilized in the future.
- Electricity usage and costs spike in the winter of 21/22 and then level out over the rest of the benchmarked years (**Figure 12a** and **Figure 12b**).
- Even though there is no electric usage between January and August of 2021, there is still a monthly cost around \$10, likely associated with a connection cost (**Figure 12a** and **Figure 12b**).
- Gas usage and costs spike in the same timeframe between December of 2021 and January of 2022 (**Figure 12c**).
- Overall, this facility’s utility costs are relatively low, only reaching a maximum of \$130 in electricity and \$400 in gas per month.

Wastewater Treatment Plant Offices

FIGURE 13A. TIME OF USE ELECTRICITY USE AND COST FOR THE WWTP OFFICES

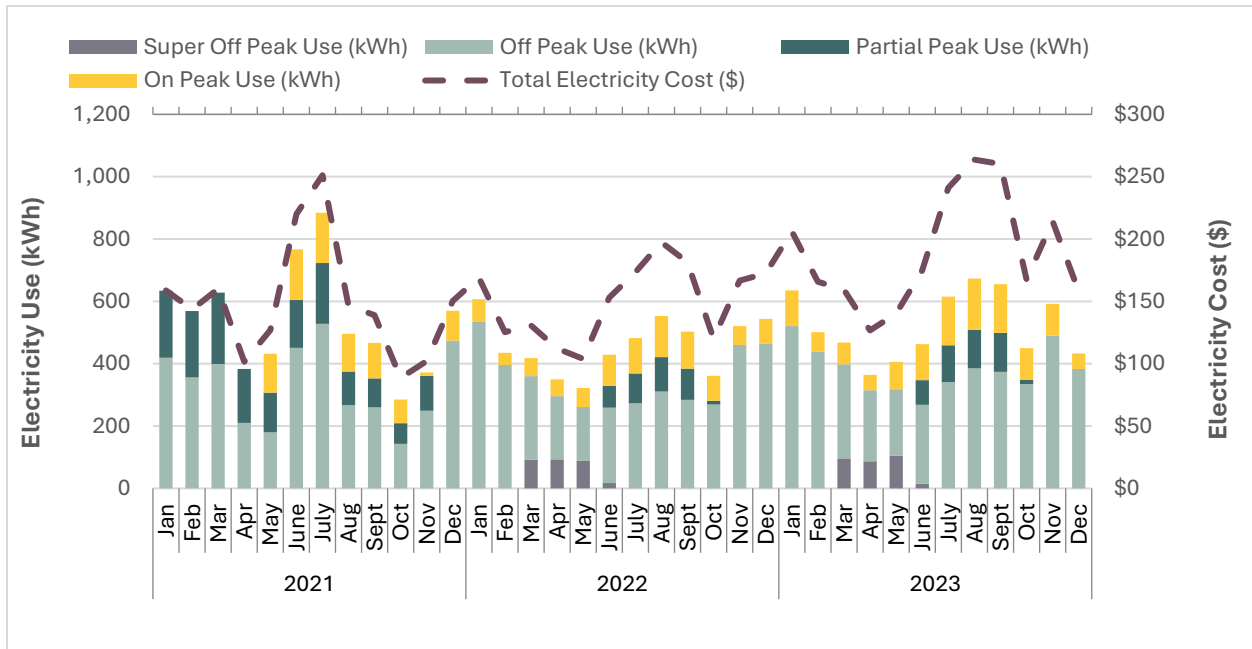
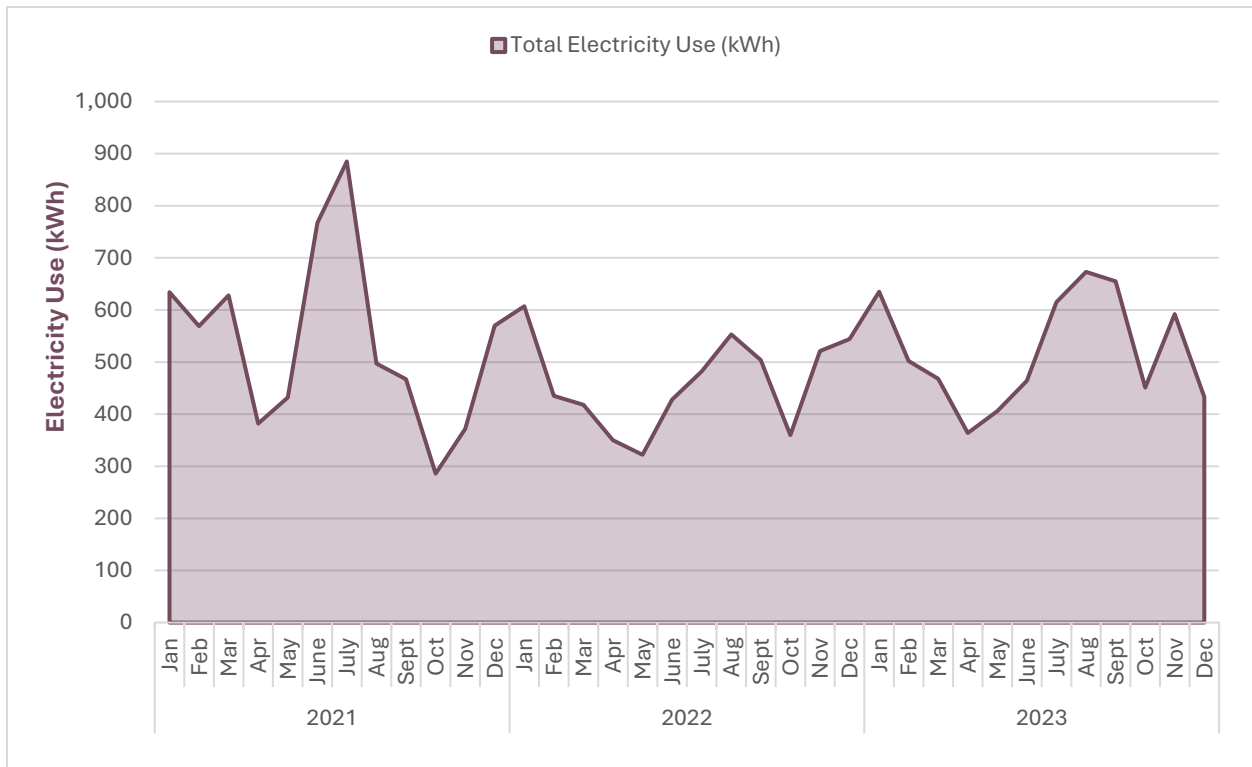


FIGURE 13B. TOTAL ELECTRICITY USE FOR THE WWTP OFFICES



Key Takeaways

- This facility has relatively low electricity usage and follows a different pattern than other City facilities, as it spikes both in the summer and in the winter (**Figure 13a** and **Figure 13b**). Because this facility does not use natural gas, its heating in the winter comes from electricity, which is why usage differs from facilities that have natural gas.
- This facility is impacted by TOU rates as seen by its cost spikes in the summer when there is more On Peak and Partial Peak usage (**Figure 13a**).
- Electricity bills increase disproportionately over time due to increasing electricity rates (**Figure 13a**). In July of 2021, this facility’s usage peaked around 900kWh, with a cost around \$250, while in July of 2023, the facility only used around 600kWh of electricity for the same price of \$250.

Wastewater Treatment Plant

FIGURE 14A. TIME OF USE ELECTRICITY USE AND COST FOR THE WWTP

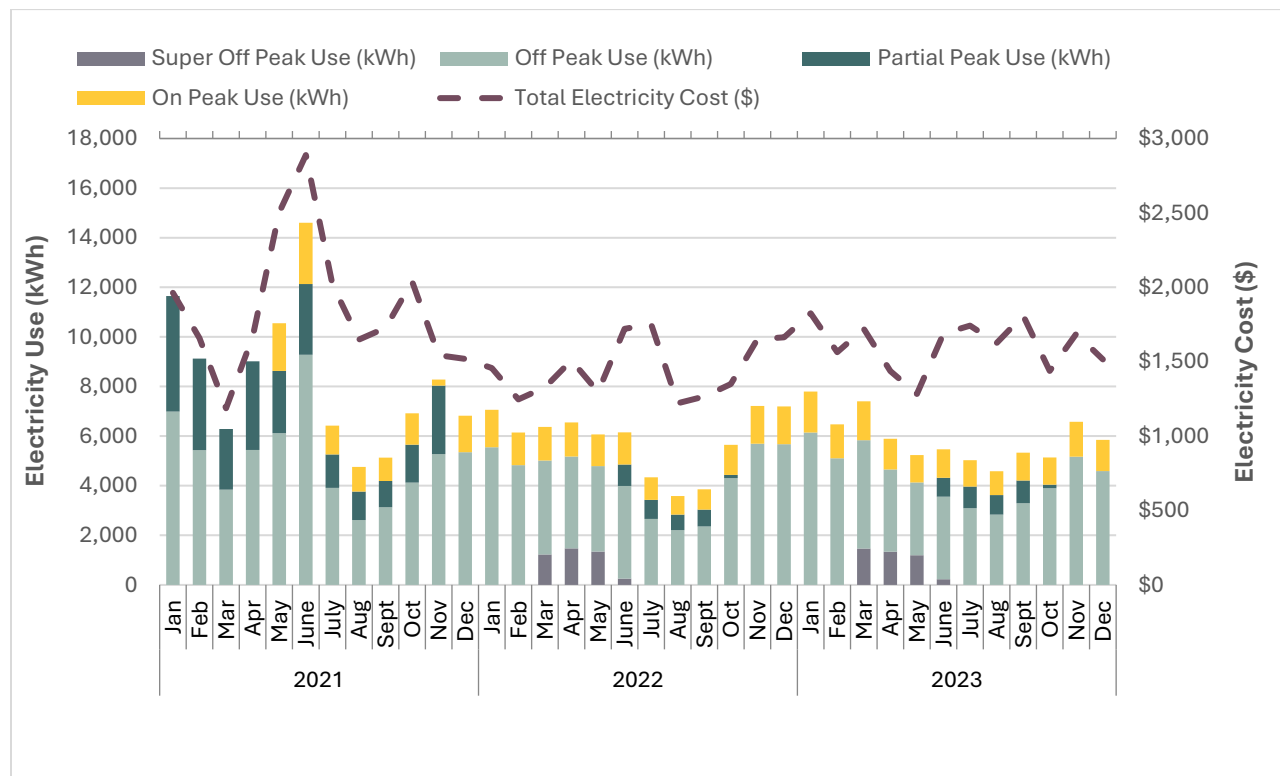
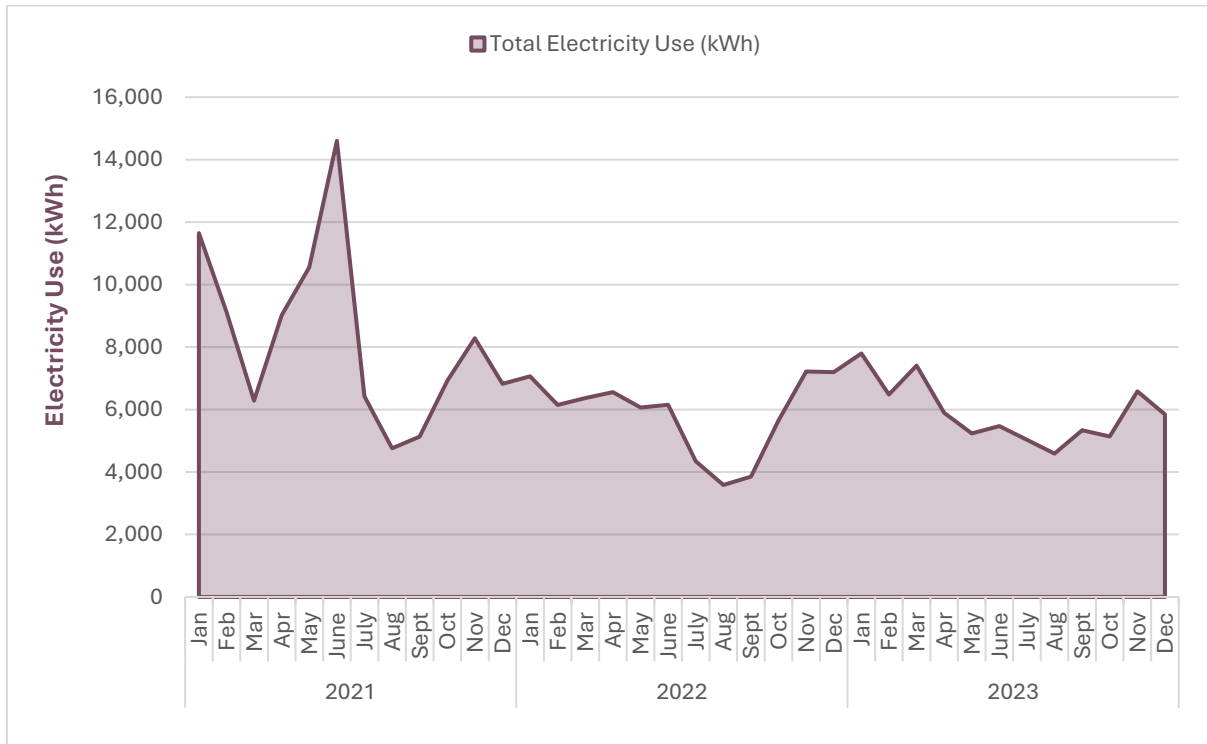


FIGURE 14B. TOTAL ELECTRICITY USE FOR THE WWTP



Key Takeaways

- The Wastewater Treatment Plant has the second highest electricity usage and costs behind the Auditorium, with a 3-year average of almost \$20,000/year (Table 4 and Table 5).
- This facility’s electricity usage spiked in June of 2021, hitting upwards of \$3,000, and has remained relatively constant each year after (Figure 14a and Figure 14b).
- In 2022 and 2023, this facility’s average monthly electric bill was around \$1,500, and increases in the summer and winter months.

Conclusions

Although most benchmarked facilities in Sutter Creek fall below the national median EUI for similar buildings, the analysis revealed that rising gas and electricity rates are resulting in higher costs disproportionate to increases in usage.

Therefore, SNEW recommends the following next steps to reduce energy use and save money through energy efficiency projects:

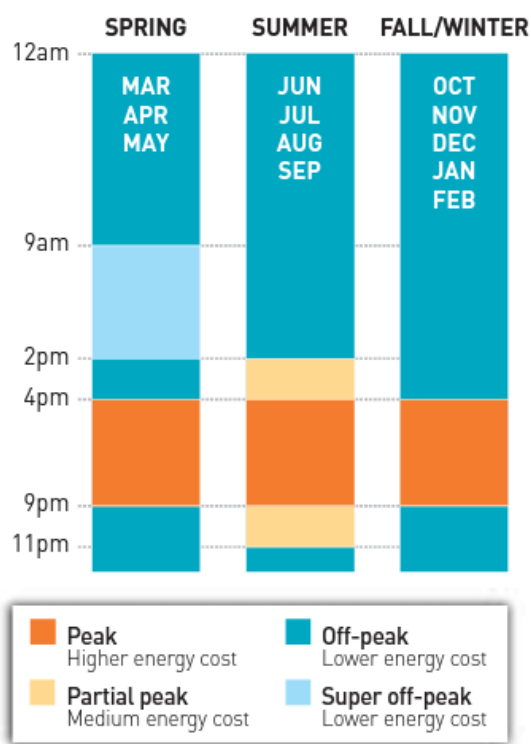
- Complete facility energy audits prioritizing facilities with the highest energy usage and costs, such as the Auditorium, the Wastewater Treatment Plant, and the Community and Administration Building, to provide the greatest savings.
- Focus on these areas for potential retrofit and electrification efforts:
 - HVAC
 - Lighting
 - Water heaters
 - Other energy-intensive equipment
 - Controls, sensors (daylighting & occupancy), and scheduling
 - Solar and Storage
 - Insulation and building envelope improvements (weatherization)
- Identify energy efficiency upgrades that can be phased in during normal upgrade cycles to improve economics.
- Follow the recommendations found in **Appendix A: Time of Use Rates and Cost Saving Strategies**.
- Provide resources and education to staff to reduce energy waste at facilities. For example, the implementation of energy efficiency behavior change initiatives can help support energy use best practices and result in savings with no cost to the City of Sutter Creek.
- Electrification of equipment could help Sutter Creek reduce the impact of rising natural gas costs. This could include switching from natural gas water heaters and space heating equipment to electric heat pumps. Implementing electrification upgrades in tandem with on-site renewable solar energy and storage could make a large impact in reducing overall energy usage and costs.
- Installing sensors and controls in energy intensive buildings like the Auditorium and Historic Grammar School could minimize energy waste from improper thermostat settings.

If you have any questions regarding this report, please contact the Sierra Nevada Energy Watch team at Sierra Business Council at SNEW@sierrabusiness.org.

Appendix A: Time of Use Rates and Cost Saving Strategies

PG&E bills Sutter Creek not only for total electricity consumption, but also for the time-of-day electricity is used as well as the “peak energy demand.” Peak, partial-peak, off-peak, and super off-peak usage refer to the different times of the day during which electricity is consumed. **Figure A-1** shows the breakdown of these TOU rates for different times of the day and different seasons. During hours of higher electricity demand (i.e., peak usage) electricity is more expensive per kilowatt-hour. However, electricity used in the middle of the day is cheaper because it is during off peak and super off-peak hours. This highlights the importance of energy efficiency upgrades to reduce usage during more expensive times of the day, specifically from 4 to 9 pm.

FIGURE A-1. PG&E’S PEAK DAY PRICING PLAN



Peak energy demand is measured in 15-minute intervals for peak, partial peak, and off-peak times. The highest measured 15-minute energy demand during each time frame determines the cost rate for the total usage in the demand window (i.e., peak, partial peak, off peak, super off peak). **Figure A-1** shows PG&E’s breakdown of peak, partial peak, off peak, and super off-peak hours. Any ability to spread usage out or move it completely out of peak and partial peak time frames would result in cost savings. SNEW recommends the following strategies that can be implemented by GVSD:

- Use a tactic called “load shedding” or “load shifting” to avoid a surge in power usage by staggering and offsetting the turning on of high consumption equipment during peak and partial peak times. For example, turning on HVAC systems between 4 pm and 4:15 pm will create a spike in demand during peak hours.

- Heat and cool the buildings to comfort levels during off peak hours. Reduce the use of personal heating and cooling devices (i.e., space heaters, fans) during peak hours.
- Transition tasks that require substantial energy consumption and aren't time sensitive to off peak times.
- Consider enrolling in a PG&E Demand Response Program. Emergency Load Response Program (ELRP) may be a good fit for Sutter Creek as it is entirely voluntary, with no penalty if facilities do not meet load reduction numbers. More information about ELRP can be found here: <https://elrp.olivineinc.com/>. If interested, please contact your SNEW or PG&E representative.

Appendix B: Electricity Usage and Cost Data

Table B-1: Auditorium Electricity Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	6,970	\$2,080.19
February 2021	6,836	\$2,023.22
March 2021	6,602	\$2,015.08
April 2021	6,229	\$1,938.72
May 2021	6,764	\$2,074.00
June 2021	8,683	\$2,837.14
July 2021	9,919	\$3,226.80
August 2021	9,779	\$3,179.95
September 2021	10,513	\$3,404.02
October 2021	7,636	\$2,378.11
November 2021	8,499	\$2,542.38
December 2021	8,919	\$2,648.03
January 2022	8,817	\$2,753.70
February 2022	7,984	\$2,551.60
March 2022	7,535	\$2,607.15
April 2022	7,333	\$2,593.67
May 2022	7,969	\$2,772.04
June 2022	9,647	\$3,603.93
July 2022	10,041	\$3,797.64
August 2022	10,594	\$3,979.30
September 2022	10,151	\$3,847.72
October 2022	8,361	\$3,012.12
November 2022	8,294	\$2,914.72
December 2022	8,951	\$3,136.88
January 2023	9,037	\$3,225.00
February 2023	9,180	\$3,276.92

Date	Electricity Usage (kWh)	Cost
March 2023	7,871	\$2,963.59
April 2023	7,767	\$2,930.28
May 2023	8,019	\$3,038.19
June 2023	9,074	\$3,609.25
July 2023	10,283	\$4,209.13
August 2023	10,551	\$4,385.50
September 2023	9,923	\$4,182.45
October 2023	8,625	\$3,449.34
November 2023	8,465	\$3,368.55
December 2023	8,448	\$3,352.84

Table B-2: Community and Administration Building Electricity Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	729	\$180.85
February 2021	791	\$195.29
March 2021	870	\$218.02
April 2021	804	\$205.21
May 2021	898	\$228.96
June 2021	2,132	\$629.76
July 2021	3,286	\$977.81
August 2021	2,619	\$784.93
September 2021	2,867	\$861.95
October 2021	1,027	\$269.35
November 2021	1,153	\$295.97
December 2021	1,016	\$261.35
January 2022	1,005	\$274.95
February 2022	985	\$273.20
March 2022	959	\$289.47
April 2022	911	\$279.61
May 2022	1,638	\$497.80

Date	Electricity Usage (kWh)	Cost
June 2022	3,190	\$1,100.04
July 2022	4,111	\$1,440.24
August 2022	4,232	\$1,480.50
September 2022	3,839	\$1,340.41
October 2022	2,290	\$723.55
November 2022	1,169	\$361.80
December 2022	1,639	\$501.82
January 2023	1,716	\$540.43
February 2023	1,851	\$585.62
March 2023	1,729	\$565.69
April 2023	1,943	\$635.81
May 2023	2,089	\$687.10
June 2023	1,411	\$523.10
July 2023	2,556	\$997.56
August 2023	3,877	\$1,505.43
September 2023	2,938	\$1,152.99
October 2023	1,469	\$530.85
November 2023	2,260	\$789.02
December 2023	1,298	\$456.06

Table B-3: Historic Grammar School Electricity Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	435	\$112.84
February 2021	487	\$124.75
March 2021	470	\$123.33
April 2021	256	\$70.52
May 2021	183	\$53.42
June 2021	1,481	\$437.05
July 2021	2,840	\$825.70
August 2021	2,792	\$819.70

Date	Electricity Usage (kWh)	Cost
September 2021	2,652	\$787.45
October 2021	240	\$69.52
November 2021	313	\$87.86
December 2021	491	\$130.83
January 2022	451	\$127.61
February 2022	536	\$153.44
March 2022	474	\$147.18
April 2022	374	\$119.80
May 2022	270	\$89.06
June 2022	254	\$92.55
July 2022	1,163	\$433.32
August 2022	2,483	\$888.31
September 2022	2,252	\$856.42
October 2022	507	\$164.12
November 2022	615	\$196.69
December 2022	659	\$208.58
January 2023	667	\$216.93
February 2023	735	\$239.94
March 2023	680	\$141.90
April 2023	520	\$177.66
May 2023	518	\$178.31
June 2023	170	\$67.99
July 2023	1,471	\$603.60
August 2023	2,166	\$830.51
September 2023	1,057	\$396.59
October 2023	378	\$144.03
November 2023	666	\$239.57
December 2023	930	\$329.04

Table B-4: Monteverde Store Electricity Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	0	\$9.85
February 2021	0	\$9.86
March 2021	0	\$10.19
April 2021	0	\$9.86
May 2021	0	\$9.53
June 2021	0	\$10.51
July 2021	0	\$9.86
August 2021	0	\$9.85
September 2021	0	\$10.61
October 2021	41	\$20.98
November 2021	73	\$28.51
December 2021	408	\$110.72
January 2022	457	\$130.61
February 2022	207	\$65.34
March 2022	232	\$77.99
April 2022	183	\$63.75
May 2022	142	\$51.69
June 2022	163	\$64.92
July 2022	170	\$68.87
August 2022	135	\$57.17
September 2022	92	\$42.39
October 2022	34	\$19.78
November 2022	72	\$32.28
December 2022	105	\$41.07
January 2023	84	\$35.63
February 2023	101	\$41.70
March 2023	81	\$35.38
April 2023	89	\$38.34
May 2023	67	\$31.00
June 2023	64	\$32.76

Date	Electricity Usage (kWh)	Cost
July 2023	134	\$61.84
August 2023	60	\$33.56
September 2023	15	\$16.25
October 2023	38	\$23.26
November 2023	44	\$26.00
December 2023	35	\$21.50

Table B-5: Wastewater Treatment Plant Offices Electricity Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	634	\$158.75
February 2021	569	\$143.57
March 2021	628	\$160.08
April 2021	382	\$101.51
May 2021	432	\$126.95
June 2021	767	\$220.05
July 2021	885	\$251.27
August 2021	497	\$146.74
September 2021	467	\$138.93
October 2021	286	\$88.63
November 2021	372	\$102.05
December 2021	570	\$150.38
January 2022	607	\$169.13
February 2022	435	\$125.31
March 2022	418	\$130.68
April 2022	350	\$112.22
May 2022	322	\$103.84
June 2022	428	\$153.03
July 2022	482	\$173.35
August 2022	553	\$197.47
September 2022	504	\$181.44

Date	Electricity Usage (kWh)	Cost
October 2022	360	\$119.99
November 2022	521	\$166.67
December 2022	544	\$172.43
January 2023	635	\$206.15
February 2023	502	\$165.74
March 2023	468	\$159.26
April 2023	364	\$126.72
May 2023	406	\$140.25
June 2023	464	\$174.84
July 2023	615	\$241.01
August 2023	673	\$263.68
September 2023	655	\$260.20
October 2023	451	\$167.63
November 2023	592	\$214.20
December 2023	433	\$157.98

Table B-5: Wastewater Treatment Plant Electricity Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	11,648	\$1,962.84
February 2021	9,124	\$1,659.07
March 2021	6,286	\$1,187.24
April 2021	9,018	\$1,665.57
May 2021	10,549	\$2,502.88
June 2021	14,602	\$2,888.99
July 2021	6,423	\$2,018.71
August 2021	4,759	\$1,649.38
September 2021	5,130	\$1,727.29
October 2021	6,920	\$2,039.78
November 2021	8,284	\$1,543.41
December 2021	6,820	\$1,518.83

Date	Electricity Usage (kWh)	Cost
January 2022	7,064	\$1,457.84
February 2022	6,145	\$1,246.25
March 2022	6,368	\$1,327.69
April 2022	6,554	\$1,508.60
May 2022	6,064	\$1,296.75
June 2022	6,152	\$1,721.41
July 2022	4,341	\$1,752.21
August 2022	3,585	\$1,220.62
September 2022	3,853	\$1,266.09
October 2022	5,651	\$1,350.27
November 2022	7,218	\$1,650.83
December 2022	7,198	\$1,663.75
January 2023	7,794	\$1,825.09
February 2023	6,477	\$1,564.13
March 2023	7,405	\$1,721.10
April 2023	5,895	\$1,436.95
May 2023	5,234	\$1,283.21
June 2023	5,470	\$1,688.24
July 2023	5,030	\$1,742.31
August 2023	4,587	\$1,625.23
September 2023	5,335	\$1,809.77
October 2023	5,136	\$1,437.88
November 2023	6,579	\$1,688.05
December 2023	5,846	\$1,515.42

Appendix C: Natural Gas Usage and Cost Data

Table C-1: Auditorium Natural Gas Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	564	\$831.62
February 2021	515	\$760.24
March 2021	505	\$754.23
April 2021	140	\$184.27
May 2021	27	\$56.74
June 2021	29	\$61.48
July 2021	27	\$56.72
August 2021	27	\$57.54
September 2021	28	\$65.97
October 2021	87	\$159.30
November 2021	115	\$235.33
December 2021	410	\$772.41
January 2022	439	\$846.51
February 2022	380	\$729.88
March 2022	193	\$364.56
April 2022	141	\$226.05
May 2022	77	\$135.84
June 2022	29	\$63.86
July 2022	27	\$60.81
August 2022	17	\$42.86
September 2022	0	\$16.68
October 2022	20	\$52.35
November 2022	416	\$867.92
December 2022	568	\$1,228.01
January 2023	433	\$1,073.25
February 2023	534	\$1,376.76
March 2023	377	\$748.50
April 2023	214	\$297.69

Date	Electricity Usage (kWh)	Cost
May 2023	86	\$124.14
June 2023	35	\$71.17
July 2023	1	\$29.85
August 2023	0	\$27.69
September 2023	0	\$30.56
October 2023	6	\$38.17
November 2023	270	\$517.16
December 2023	357	\$745.67

Table C-2: Community Building Natural Gas Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	102	\$153.34
February 2021	82	\$124.59
March 2021	91	\$138.96
April 2021	46	\$59.24
May 2021	38	\$48.75
June 2021	24	\$34.24
July 2021	0	\$8.11
August 2021	0	\$8.11
September 2021	0	\$8.65
October 2021	23	\$42.63
November 2021	65	\$124.12
December 2021	130	\$244.02
January 2022	132	\$254.01
February 2022	116	\$222.17
March 2022	63	\$117.72
April 2022	60	\$97.64
May 2022	55	\$94.08
June 2022	54	\$96.52
July 2022	51	\$93.44

Date	Electricity Usage (kWh)	Cost
August 2022	50	\$88.21
September 2022	53	\$101.22
October 2022	51	\$102.81
November 2022	112	\$237.96
December 2022	155	\$342.66
January 2023	131	\$331.66
February 2023	160	\$420.02
March 2023	112	\$229.24
April 2023	52	\$81.01
May 2023	16	\$33.05
June 2023	13	\$31.78
July 2023	11	\$29.07
August 2023	9	\$26.44
September 2023	12	\$33.52
October 2023	9	\$29.91
November 2023	60	\$125.13
December 2023	131	\$271.29

Table C-3: Administration Building Natural Gas Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	93	\$169.29
February 2021	86	\$161.31
March 2021	80	\$152.84
April 2021	30	\$53.91
May 2021	2	\$6.85
June 2021	1	\$4.49
July 2021	0	\$3.94
August 2021	0	\$3.95
September 2021	0	\$4.21
October 2021	17	\$36.57

Date	Electricity Usage (kWh)	Cost
November 2021	64	\$144.03
December 2021	100	\$230.89
January 2022	92	\$213.19
February 2022	77	\$183.21
March 2022	51	\$109.51
April 2022	34	\$76.96
May 2022	8	\$16.76
June 2022	0	\$4.21
July 2022	0	\$3.95
August 2022	0	\$3.95
September 2022	0	\$4.21
October 2022	3	\$7.71
November 2022	78	\$205.93
December 2022	119	\$320.17
January 2023	108	\$314.65
February 2023	134	\$414.44
March 2023	114	\$288.51
April 2023	65	\$137.13
May 2023	18	\$31.47
June 2023	0	\$4.21
July 2023	1	\$4.37
August 2023	0	\$3.82
September 2023	0	\$4.21
October 2023	11	\$23.17
November 2023	59	\$135.69
December 2023	68	\$164.21

Table C-4: Historic Grammar School Natural Gas Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	334	\$491.14
February 2021	368	\$538.40
March 2021	347	\$514.08
April 2021	125	\$154.60
May 2021	45	\$63.54
June 2021	4	\$20.94
July 2021	4	\$19.78
August 2021	4	\$19.91
September 2021	4	\$21.73
October 2021	56	\$99.84
November 2021	165	\$309.63
December 2021	404	\$749.37
January 2022	373	\$710.51
February 2022	463	\$870.03
March 2022	356	\$634.02
April 2022	233	\$363.33
May 2022	134	\$225.19
June 2022	10	\$32.95
July 2022	4	\$22.33
August 2022	4	\$22.03
September 2022	4	\$23.66
October 2022	3	\$20.70
November 2022	465	\$968.14
December 2022	524	\$1,135.00
January 2023	535	\$1,319.34
February 2023	625	\$1,606.18
March 2023	561	\$1,100.30
April 2023	374	\$498.86
May 2023	149	\$194.80
June 2023	6	\$37.49

Date	Electricity Usage (kWh)	Cost
July 2023	4	\$33.53
August 2023	3	\$31.46
September 2023	4	\$36.17
October 2023	4	\$35.00
November 2023	350	\$661.06
December 2023	486	\$1,005.08

Table C-5: Monteverde Store Natural Gas Usage and Cost Data

Date	Electricity Usage (kWh)	Cost
January 2021	0	\$8.11
February 2021	0	\$8.11
March 2021	0	\$8.38
April 2021	0	\$8.11
May 2021	0	\$7.84
June 2021	0	\$8.65
July 2021	0	\$8.11
August 2021	0	\$8.11
September 2021	0	\$8.65
October 2021	0	\$7.84
November 2021	67	\$127.66
December 2021	204	\$385.61
January 2022	209	\$404.98
February 2022	17	\$47.02
March 2022	0	\$16.15
April 2022	0	\$15.63
May 2022	0	\$15.11
June 2022	0	\$16.68
July 2022	0	\$15.63
August 2022	0	\$15.63
September 2022	0	\$16.68

Date	Electricity Usage (kWh)	Cost
October 2022	0	\$15.11
November 2022	0	\$17.20
December 2022	0	\$15.11
January 2023	0	\$8.11
February 2023	0	\$8.65
March 2023	0	\$7.84
April 2023	0	\$8.11
May 2023	0	\$7.84
June 2023	0	\$8.65
July 2023	0	\$8.11
August 2023	0	\$7.84
September 2023	0	\$8.65
October 2023	0	\$8.11
November 2023	0	\$8.92
December 2023	0	\$7.84