Energy Management Report

SANTA MONICA-MALIBU UNIFIED SCHOOL DISTRICT

PREPARED ON:
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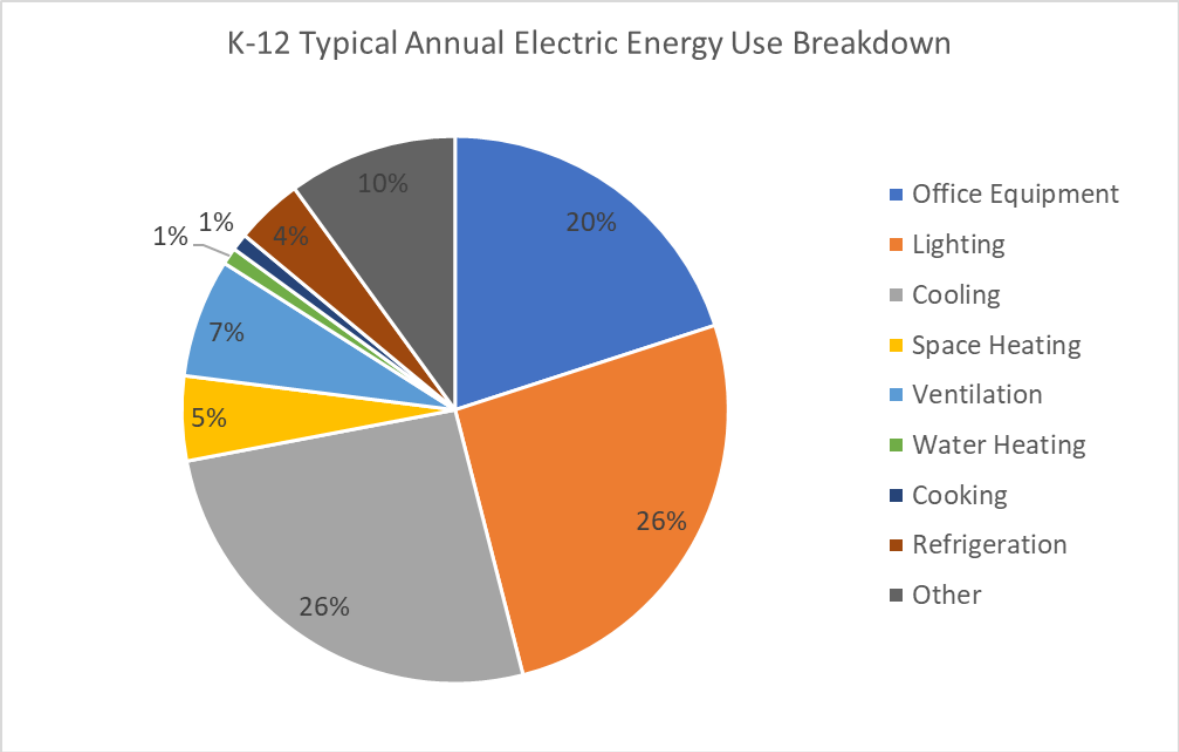
Section 1: Executive Summary

The Purpose of This Report

This report is an opportunity to evaluate the current status of energy consumption for the District and will track the District's performance long term. The report will be provided semi-annually and will serve as a tool to discuss and evaluate performance, review and implement policies, and identify opportunities for making further improvements.

Recommendations are made upon analysis, observation, and experience. Any recommendation requiring changes to equipment, set points, or educational programs will be discussed with the appropriate school representative before implementation. Contact to outside vendors to request changes will not be made until approval from the District.

The pie chart below shows a typical breakdown of annual electric energy use for K-12 schools. Because lighting, HVAC (cooling, heating ventilation), and electric equipment make up most electric use, this is where the focus is placed when trying to reduce overall electric use.



Observations and Recommendations

While conducting the site visits, temperatures ranged from the low 70s to the low 80s, with mostly sunny weather. During the site walks, all main energy use areas were observed (classrooms, front offices, cafeterias, kitchens, computer labs, and libraries) to achieve a representative survey of energy use throughout the school. All sites were closed and unoccupied except for construction workers and HVAC technicians. Therefore, the sites were not running at normal HVAC set-points in most areas.

Across all schools visited, classroom equipment was standard, consisting of an AV projector, laptop charging cart, desktop computers in a few areas, and small personal appliances. Office areas consisted of the standard office equipment, including desktop computers, copy machines, printers, and appliances within the breakrooms.

The following sections look at observations and associated recommendations by site.

John Adams Middle School

During the site walks, **(21) areas were surveyed** for opportunities to reduce energy consumption. Thermostats at this location were a mixture of varieties, ranging from Pelican Wireless to traditional analog thermostats. Exterior lighting fixtures were LED and controlled with photocell controls. Interior lighting was primarily LED and controlled with motion sensors to detect occupancy. Soccer field lighting appeared to be high wattage incandescent fixtures (possibly metal halide or high-pressure sodium) and would be good potential for future upgrades.

John Adams Middle School recently had new air conditioning units installed in August 2019 along with Pelican Wireless thermostats. These thermostats appeared to have inconsistent scheduling and functionality, where one room would be set to occupied settings (cooling at 72°F), while others had set-points that were locked. Efficient energy practice suggests keeping set-points and schedules consistent across all areas**. During school closures or breaks, it is advised to set all thermostats into a set-back mode (85°F for cooling/45°F for heating)** to reduce the amount of electricity and natural gas being used.

Each of the classrooms was equipped with a laptop charging station that was plugged in and charging. **We recommend that charging stations be turned off or unplugged until they are needed for the students**, as each of these units uses about 1.5-0.5 kWh per day. At the District's current rate, this equates to **$0.10-0.25 per unit per day**, which annually equates to **$36.50-$91.25 per unit** at the District's current electricity cost rate if they are never unplugged.

Lastly, the computer lab (Room 45) had all computers left on while unoccupied. The room was locked at the time of site visit and no action was able to be taken. **We recommend that desktop computers are turned off, as the computers use just as much energy with the screensaver as being fully on**.

Will Rogers Elementary School

During the site walks, **(18) areas were surveyed** for opportunities to reduce energy consumption. Thermostats at this location were older Honeywell 7-day programmable thermostats, though all units were off during the site walks. Exterior light fixtures were LED and controlled with photocells. Interior lighting appeared to be fluorescent and controlled with the traditional on-off switch.

Overall, the school appeared to be well-managed, with most appliance and classroom equipment (laptop charging stations, mini-fridges) turned off and unplugged. Will Rogers Elementary School is designated as a meal-serving location during the closures, though there did not appear to be anyone present on campus during the site walks. The staff breakroom had refrigerators that remained plugged in and operating. The freezer was slightly open but had frost buildup around the edge of the unit and was frozen shut. **We recommend to empty, clean, and unplug these units while not used for the closure and summer break.**

Lastly, it was noted that the serving refrigerators were plugged in and operating without any product inside. These serving refrigerators cost an estimated $0.60-0.75 daily per unit in energy costs, while full-sized, reach-in commercial refrigerators cost between $2.00-3.50 daily per unit. At Will Rogers Elementary alone, this would equate to an estimated **$150-250 in savings if these remained shut down throughout the summer**.

Webster Elementary School

During the site walks, **(14) areas were surveyed** for opportunities to reduce energy consumption. Exterior light fixtures were LED and controlled with photocells. Interior lighting appeared to be LED and controlled with occupancy sensors. However, during the site walks, all lights were on in each of the classrooms.

Currently, the school had installed smaller, temporary portable AC units within each of the classrooms. At the time of the site walks,

permanent, full-sized HVAC air handler units and ducts were being installed in each of the classrooms. Therefore, there should be very limited energy usage from HVAC until the project is complete.

Within the classrooms, there were several mini-fridges left plugged in and with food. As with the other sites, **we recommend emptying, cleaning, and unplugging these units while not used for the closure and summer break.** Additionally, all iMac computers located within the computer lab were found on and subsequently turned off at the time of the visit.

Malibu Elementary School

During the site walks, **(18) areas were surveyed** for opportunities to reduce energy consumption. Exterior and Parking light fixtures were LED and controlled with photocells. Interior lighting was also LED and is controlled with occupancy sensors. HVAC is controlled with programmable thermostats, set to override only for an hour at a time. This means that occupants must actively turn on the HVAC to use it, and it will turn off after a set amount of time. All thermostats were off during the site walks, which shows maintenance of the thermostat programming to be override only.

Lastly, as with most of the other schools, most mini-fridges and refrigerators were left plugged in and operating with food. The exception was the front office, which had cleaned out and unplugged the fridge with the door left open to prevent mold. **It is recommended that all other locations follow suit when performing site shutdown procedures.**

Check-list based on Site Walk Observations

Observations and Recommended Action	Check	Location
Mini-fridges were found plugged in with minimal contents. It is recommended to clean out and unplug so that these are not using energy during the summer break. Mini-fridges were found plugged in within the following areas:	**John Adams Middle School**	
		(3) in the front office
		Room T02
		Room 50
		Room 54
	Will Rogers Elementary	
		Room 302 - Library
	Webster Elementary	
		Principal's Office
		Room 9
		Room 18
	Malibu Elementary	
		Principal's Office
		Portable Classroom 25
		Room 3 - Library
Clean out breakroom refrigerators and unplug so that these are not using energy during the summer break	**John Adams Middle School**	
		Office - Break room
	Will Rogers Elementary	
		(1) Refrigerator and (1) Freezer in the Breakroom (freezer was frozen shut)
		Room 407
	Malibu Elementary	
		Room 2
Check Set-points on Pelican Wireless Thermostats. Set-points during the site walks were found to be 72°F in the following areas:	**John Adams Middle School**	
		Room 54
		Cafeteria
Consolidate inventory in Kitchens to a single reach-in or walk-in refrigerator. Clean out unused reach-in or serving refrigerators and unplug during extended school breaks.		**All Sites in which there are no meal services going on**
Computers that were not being used had the monitors turned off to prevent usage during the remainder of the closure.		**John Adams MS - Room 45 (Computer Lab)**
	X	**Webster Elementary - Room 13**

Section 2: Observations & Development

May 5, 2020

The visit entailed identifying opportunities to reduce energy consumption during the school closures. The following pictures were taken to convey observations and opportunities noted while on site.

John Adams Middle School Pictures

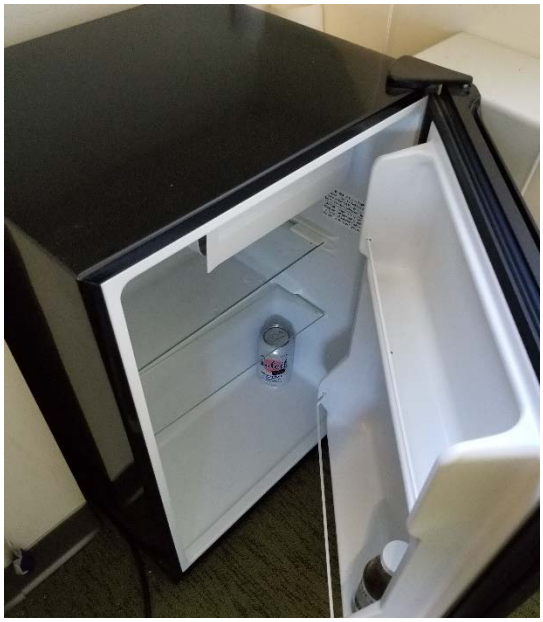


Figure 1. Mini-fridges in the front office and classroom were left plugged in and running during the school closure while they are not being used. A total of (7) mini-fridges were found in the (21) areas that were surveyed.

Figure 2. Heat pump thermostats in the front office were set to heat in the front office and in the conference room. This unnecessarily uses electricity when sites are closed and generally unoccupied.

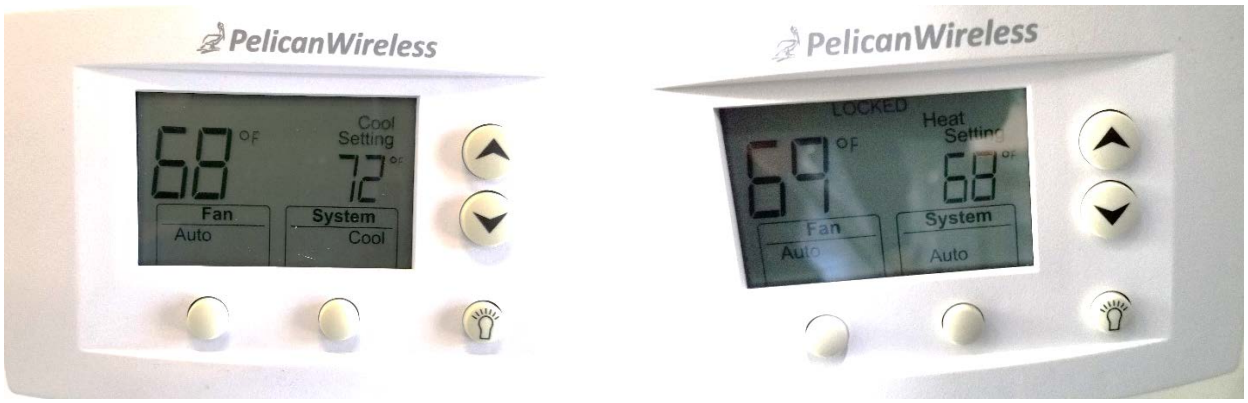


Figure 3. Thermostat set-points and setting on Pelican Wireless thermostats were inconsistent throughout the District. The thermostat in Room 54 (left) was set to 72°F for cooling but was open to changing set-points. The thermostat in Room 86 (right) was set to 68°F for heating and locked.

Figure 4. Computers left on in the Computer Lab (Room 45) during the closure. This room was not able to be accessed at the time of the site visit.

Will Rogers Elementary Pictures

Figure 5. Multiple computer charging stations were left plugged in and operating. These units use about $0.10 – 0.25 daily per unit, which can add up when there are hundreds throughout the District. Additionally, leaving laptops plugged in for extended periods can shorten battery life.

Figure 6. Freezer in the staff lounge was left plugged in, but the door was slightly open and frozen. This will need to be unplugged and slowly defrosted to be cleaned out. It is recommended to keep this unit unplugged throughout the remainder of the closure.

Figure 7. Serving refrigerator in the Kitchen of Will Rogers left plugged in with no product inside. It is recommended that any food left in the kitchen fridges and serving fridges be consolidated to a single refrigerator and freezer. At the same time, the rest of the units are cleaned out and unplugged.

Webster Elementary Pictures

Figure 8. HVAC construction occurring at Webster Elementary

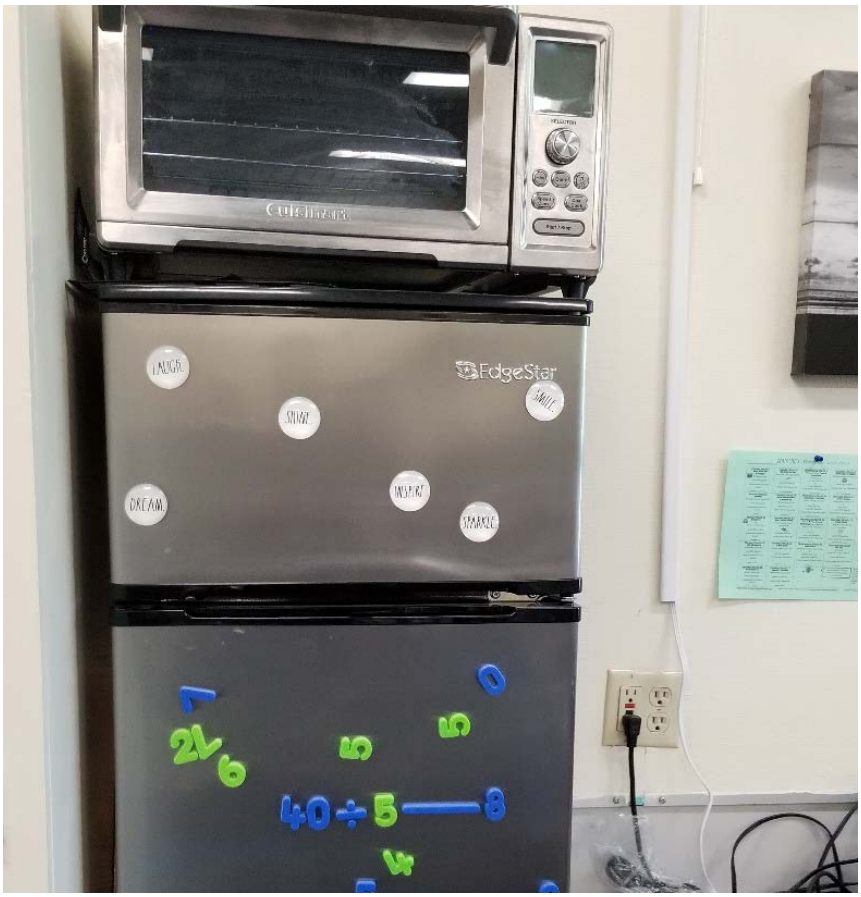


Figure 9. Mini-fridges were left plugged in and operating

Malibu Elementary School Pictures

Figure 10. Examples of good energy management at Malibu Elementary School. (Left) Mini-fridge in the front office was unplugged, cleaned out and had a trash bag underneath to catch melted ice. (Right) Surge protector with iPad chargers was unplugged for the summer.

Figure 11. Refrigerator in Room 2 was left plugged in with food and drink items.