Santa-Monica Malibu USD
Energy Management Report

SANTA MONICA-MALIBU UNIFIED SCHOOL DISTRICT

PREPARED ON:
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Section 1: Executive Summary

This report is in correspondence to the site walks done at the Santa Monica Unified School District on February 26th and 27th to identify energy-saving opportunities to lower energy costs throughout the District. It covers the critical observations made at the site and recommendations on how to continue forward. Overall there are excellent opportunities for energy saving through a mixture of policy updates and technology upgrades.

Recommended Action Items

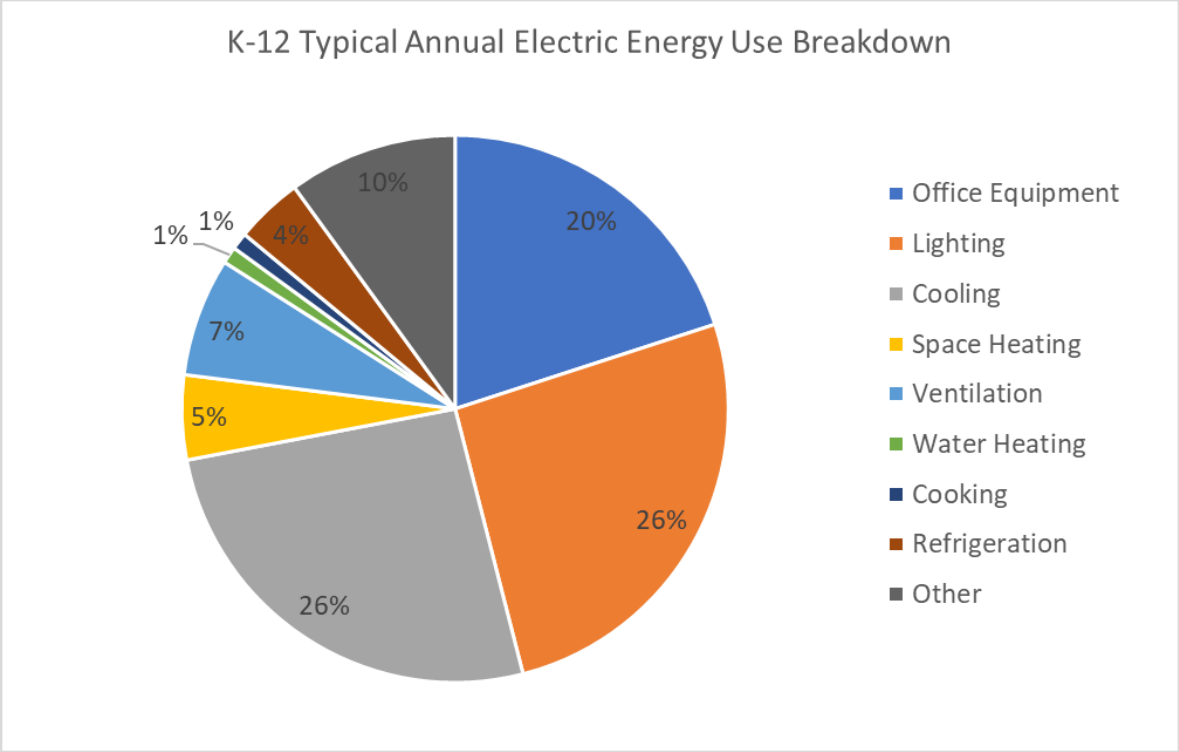
- Unplug mini-fridge when they are not in use (spring, summer, and winter breaks)
- Avoid having mini-fridges in classrooms or nondesignated break areas. **A mini-fridge uses about half the energy a full-sized fridge does but at a quarter of the size.**
- Keep doors closed while HVAC is operating and maintain proper thermostat set points
- Install motion sensor vending misers on vending machines located indoors in the staff lounge
    - Cost **$135 per unit**, and can save an estimated **$80-140 per year** by reducing the energy consumption of vending machine by 30%
    - The unit may pay for itself within the first year through the savings generated
- Vending misers minimize energy consumption by turning off the machine when no motion is perceived for a period (turning on at regular intervals to ensure the product remains cold).
- Keep lighting and projectors turned off while rooms are unoccupied
- Avoid keeping Keurig plugged in when not in use due to a continuous energy drainage
- Ensure exterior lighting is off during the daytime
- Ensure proper weather sealing is installed on wall mounted air conditioning units

The Purpose of This Report

This report is an opportunity to evaluate the current status of energy consumption for the School 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 given upon analysis, observation, and experience. Any recommendation requiring changes to equipment, setpoints, 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 electrical equipment make up the majority of electric usage, this is where the focus is placed when trying to reduce overall electronic use.



Summary of Findings

While conducting the site walks, temperatures ranged from 61°F to 73°F on February 26th, and temperatures ranged from 70°F to 79°F on February 27th. The focus for these site walks was to visit sites identified to have higher energy usage per square foot (kWh/SF) and identify potential energy-saving opportunities to lower energy costs throughout the District. There is construction in progress at multiple sites, yielding variation in energy usage across the District. Energy behavior-wise, mini-fridges were found in classrooms, thermostat settings were set correctly where applicable, and exterior lighting was found engaged during the daytime. With the installation of HVAC units in the summer of 2020, energy usage is expected to rise. SitelogIQ noted the following observations at the time of the site walks.

Edison Elementary School:

- The spring on the door in classroom 207 does not close all the way
- Setpoints are between 68-72°F - on track
- Storage room 309 had the lights left on

John Adams Middle School:

- Rooms with air conditioning had their air conditioning off
- Some rooms have yet to use their air conditioning units
- Exterior lights near the cafeteria were on, and exterior doors were left open

Will Rogers Elementary School:

- Exterior hallway lights on during the daytime near the office (700)
- Tv/google whiteboard left on while not in use
- Few mini-fridges found on site

Obama Center for Inquiry and Exploration:

- Stage lights left on while the space is unoccupied
- Exterior door left open near MPR while AC running
- Stage lights on while space unoccupied

Santa Monica High School:

- Lights on during the daytime near the construction at the tennis courts, outside hallway near Admin, and Innovation
- North gym interior lights usually on during space unoccupied
- Classroom L-203 setpoints are too close at 67-69°F

John Muir Elementary/SMASH:

- Hallway door near 204 left open

McKinley Elementary School:

- Room 208 was occupied and had their air conditioning was off while Room 207 was unoccupied, and the air conditioning was left on
- Room 110 exterior door was open while setpoints are 65-53°F
- Proper unoccupied settings at 90-50°F
- Six classrooms out of 16 visited have a mini-fridge (38%)
- Lights on stage cycle when turned on
- Exterior light on near B11 during the daytime

Franklin Elementary School:

- Christmas light decoration engaged during the daytime in the office
- 7 out of 19 locations visited had mini-fridges (37%)
- Exterior building doors left open in the building containing room 6

Lincoln Middle School:

- Exterior lights are on during the daytime in the hallway
- Six out of 16 of the classrooms visited had mini-fridges (38%)

Malibu High School/Middle School:

- The portable library had Christmas light decoration
- Room 207 was an empty room with the fan engaged
- There is a gap in the wall-mount air conditioning installation in room 606
- Five out of 16 of the classrooms had mini-fridges (31%)

Recommendations

- Keep doors closed while HVAC is operating
- Keep lighting and projectors turned off while rooms are unoccupied
- Avoid having mini-fridges in classrooms or nondesignated break areas. **A mini-fridge uses about half the energy a full-sized fridge does but at a quarter of the size.**
- Avoid keeping Keurigs plugged in when not in use due to a continuous energy drainage
- Unplug mini-fridge when they are not in use
- Ensure exterior lighting is off during the daytime
- Have proper weather sealing on wall mounted air conditioning units
- Install motion sensor vending misers on vending machines located indoors in the staff lounge
    - Cost **$135 per unit**, and can save an estimated **$80-140 per year** by reducing the energy consumption of vending machine by 30%
    - Based on the average K-12 school occupancy schedule, the unit will pay for itself within the first year through the savings generated

Figure 1. Vending misers retrofitted on vending machines at another District. Vending misers reduce energy consumption by turning off the machine when no motion is sensed for 15 minutes (turning on at regular 90-minute intervals to ensure the product remains cold).

Section 2: Observations & Development

Edison Elementary School Pictures

Figure 2. The spring-loaded door does not close by itself in classroom 207. When HVAC runs, it will lead to air leaking out of the space where the temperature should be adjusted.

John Adams Middle School Pictures

Figure 3. Exterior doors were wide open while the air conditioning is running in the cafeteria. It is recommended to have the doors closed while the unit is running.

Figure 4. Exterior lights are on during the day near the cafeteria. It is recommended to have the exterior lights off during the day time.

Figure 5. In classroom 53 (breakroom), a mini-fridge was found. To encourage and reduce the need for the mini-fridge, a recommendation to have a full size-fridge that is more efficient for the amount of storage space provided.

Will Rogers Elementary School Pictures

Figure 6. Exterior hallway lights on near the nurse's office during the daytime.

Obama Center Pictures

Figure 7. The stage lights left on while the stage was not used. The multipurpose room was set up to be a voting area, but curtains for the stage were pulled to close off the light.

Figure 8. It is recommended to have the Keurigs off after school hours, weekends, and holidays due to the coils being heated continuously for some units while it is plugged in.

Santa Monica High School Pictures

Figure 9. Exterior lights found turned on near the Admin building, multiple lights on around the innovation building, and near the construction of the parking lot.

Figure 10. Multiple Caged Vending machines found around the campus that could benefit from motion detection sensor (vending misers).

Figure 11. Classroom L109 had Christmas lights around the light board and two mini-fridges. It is recommended that these are off during the weekends and holidays to save energy.

Figure 12. Computers in the computer lab of the innovation building had a power-saving mode. The displays did not have a screen saver, which is an excellent energy-saving practice.

John Muir/SMASH Pictures

Figure 13. Mini-fridges found on-campus classrooms and break rooms. It is recommended to replace three mini-fridges with a single full-sized fridge. A mini-fridge uses roughly half of the power for a quarter of the storage capacity of a full-size refrigerator.

Figure 14. Exterior lights found near the library, classroom 600, and class 610.

McKinley Elementary School Pictures

Figure 15. Exterior light was on outside of room B11.

Figure 16. Six out of 16 of the rooms (38%) locations visited had mini-fridges.

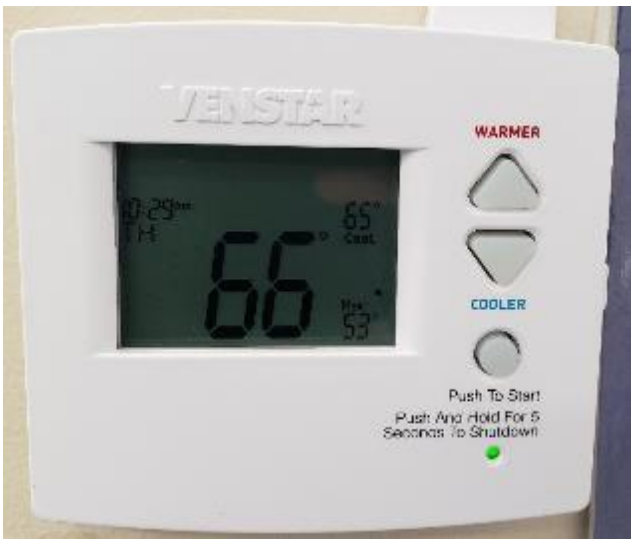


Figure 17. The setpoints are low, at 53°-65°F, in room 110.

Franklin Elementary School Pictures

Figure 18. Christmas lights were found in the front office.

Figure 19. Seven out of 19 (37%) of the locations visited had a mini-fridge.

Lincoln Middle School Pictures

Figure 20. Exterior lights found on while walking from the library to the music room and near room 314.

Figure 21. six out of 16 (38%) of the rooms visited had mini-fridges

Malibu High School / Middle School Pictures

Figure 22. 8 caged vending machines near the cafeteria that could be equipped with a motion sensor vending miser. Also, six uncaged vending machines near the pool area by the bungalows.

Figure 23. Exterior LED lights on seen from when traveling from auditorium to the teacher lounge. Also, light on during the day near the gymnasium.

Figure 24. The air conditioning unit is not sealed well to the outside. It is recommended to ensure proper weather sealing during installation.

Next Steps

To expand the services provided to the District, SitelogIQ will need to collect the following information/data:

- Water usage and cost data for as far back as available
- Online Water Utility login (username and password) or bills provided monthly.