ENERGY AND WATER MANAGEMENT CONSERVATION

Resource Management Program

In the development of the district's resource management program, the Superintendent or designee shall analyze and review the lighting; heating, ventilation, and air conditioning systems; water heaters; electrical equipment and appliances; water use and irrigation; and solid waste and recycling systems. The following district operations shall be incorporated into the district's resource management program:

1. Educational programs

2. Classroom and building management and maintenance

3. Food services and equipment maintenance

(cf. 3551 - Food Service Operations/Cafeteria Fund)

4. Landscaping

5. New construction

(cf. 7110 - Facilities Master Plan)

6. Administrative operations

7. Use of facilities by outside groups

(cf. 1330 - Use of School Facilities)
(cf. 3512 - Equipment)
(cf. 7111 - Evaluating Existing Buildings)

The Superintendent or designee may solicit input from staff, students, and parents/guardians about the district's program. The Superintendent or designee shall provide staff and students with training and guidance on best practices to achieve the district's goals, such as a reward program to recognize outstanding accomplishments.

Responsibilities:

- Every person is expected to become an “energy saver” as well as an “energy consumer.”

- The staff member is responsible for implementing the guidelines during the time that he/she is present in the instruction room or office.
- The custodian is responsible for control of common areas, i.e., halls, cafeteria, etc.
- Since the custodian is typically the last person to leave a facility in the evening, he/she is responsible for verification of the nighttime shutdown.
- The facility administrator is responsible for the total energy usage of his/her facility.
- The Energy Manager provides at least semi-annual program update reports to the Board.
- The Energy Manager performs routine audits of all facilities and communicates the audit results to the appropriate personnel.
- The Energy Manager is responsible for either directly or indirectly making adjustments to the District's Energy Management System (EMS), including temperature settings and run times for Heating, Ventilation and Air Conditioning (HVAC) and other controlled equipment.
- Administration will regularly communicate the importance and impact of the energy conservation program to its internal and external constituents.
- The Energy Manager provides monthly energy savings reports to facility administrators detailing performance results.
- The District is committed to and responsible for a safe and healthy learning environment.

To complement the District's behavioral-based energy conservation program, the District shall develop and implement a preventive maintenance and monitoring plan for its facilities and systems, including HVAC, building envelope, and moisture management.

General:

1. Instruction room doors shall remain closed when HVAC is operating. Ensure doors between conditioned space and non-conditioned space remain closed at all times (i.e., between hallways and gym or pool area).

2. Proper and thorough utilization of data loggers will be initiated and maintained to monitor relative humidity, temperature, and light levels throughout the organization's facilities to ensure compliance with organization guidelines.
3. All exhaust fans should be turned off daily.
4. All office machines (copy machines, laminating equipment, etc.) shall be switched off each night and during unoccupied times. Fax machines should remain on.
5. All computers should be turned off each night. This includes the monitor, local printer, and speakers. Network equipment is excluded.
    a. A signal to shut down all computers remotely will be sent out at 6 pm nightly. Occupants still working can abort the shutdown by hitting the escape key. All other computers will be shut down within 10-15 minutes of the signal. Occupants need to save all information on their computers prior to the end of the work day.
6. All capable PC's should be programmed for the "energy saver" mode using the power management feature. If network constraints restrict this for the PC, ensure the monitor "sleeps" after 10-minutes of inactivity.

Cooling Season Occupied Set Points[1]:	**74°F - 78°F**
Unoccupied Set Point:	**90°F**
Heating Season Occupied Set Points[1]:	**68°F - 72°F**
Unoccupied Set Point:	**40°F**

[1] Set points are in accordance with ASHRAE 55 "Thermal Conditions for Human Occupancy"

Air Conditioning Equipment

1. Occupied temperature settings shall **NOT be set below 74°F.**
2. During unoccupied times, the air conditioning equipment shall be **off**. The unoccupied period begins when the students leave the area at the end of day as well as when school is not in session. It is anticipated that the temperature of the instruction room will be maintained long enough to afford comfort for the period the staff remains in the instruction room after the students have left.

3. Air conditioning start times may be adjusted (depending on weather) to ensure instruction room comfort when instruction begins.
4. Ensure outside air dampers are closed during unoccupied times.
5. Ceiling fans should be operated in all areas that have them.
6. Relative humidity levels shall not exceed 60% for any 24 hour period.
7. Air conditioning should not be utilized in facilities during the summer months unless the facilities are being used for summer school or year-round school. Air conditioning may be used by exception only or in those facilities that are involved in team-cleaning.
8. In all areas which have evaporative coolers such as shops, kitchens and gymnasiums, the doors leading to halls which have air-conditioned instruction rooms or dining areas should be kept closed as much as possible.
9. Where cross-ventilation is available during periods of mild weather, shut down HVAC equipment and adjust temperature with windows and doors. Cross-ventilation is defined as having windows and/or doors to the outside on each side of a room.
10. Ensure dry food storage areas are maintained within code requirements. Typically, this is 55F-75F temperature and 35%-60% Relative Humidity. Utilize loggers to verify.

Heating Equipment

1. Occupied temperature settings shall **NOT be above 72°F.**
2. Heating start times may be adjusted (depending on weather) to ensure instruction room comfort when instruction begins.
3. The unoccupied temperature setting shall be 55°F (i.e., setback). This may be adjusted to a 60°F setting during extreme weather.
4. The unoccupied time shall begin when the students leave an area as well as when school is not in session.
5. During the spring and fall when there is no threat of freezing, all steam and forced air heating systems should be switched off during unoccupied times. Hot water heating systems should be switched off using the appropriate loop pumps.

6. Ensure all domestic hot water systems are set no higher than 120°F or 140°F for cafeteria service (with dishwasher booster).
7. Ensure all domestic hot water recirculating pumps are switched off during unoccupied times.
8. For heat pumps, ensure a 6°F dead-band between heating and cooling modes.
9. Heating oil and propane (if applicable) levels should be physically measured and recorded by "sticking the tanks" at least on the following intervals: 1) recurring scheduled monthly date, 2) immediately before new delivery, 3) immediately after delivery.

Lighting

1. All unnecessary lighting in unoccupied areas will be turned **off**. Staff should make certain that lights are turned off when leaving the instruction room or office when empty. Utilize natural lighting where appropriate.
2. All outside lighting shall be **off** during daylight hours.
3. Gym lights should not be left on unless the gym is being utilized.
4. All lights will be turned **off** when students and staff leave for the day. Custodians will turn on lights only in the areas in which they are working.
5. Refrain from turning lights on unless definitely needed. Remember that lights not only consume electricity, but also give off heat that places an additional load on the air conditioning equipment and thereby increases the use of electricity necessary to cool the room.
6. Night custodians are to adhere to night time lighting procedures. All unoccupied areas of sites need to have lights turned off by 7 pm nightly. For safety reasons, rooms in the immediate area of working custodians can have lights on.

Appliances

1. All appliances are to meet Energy Star Regulations.
2. All appliances will be emptied and unplugged and removed to a common area over extended vacation periods (spring break, winter break, and summer vacation) if not already maintained by the owner/occupant.

3. Appliances supporting animals in the classrooms will require approval from the Energy Manager in consultation with the site principal before placement in the class. Exception is for the Science Departments at Middle and High Schools.
4. Microwaves and coffee pots may be in central locations but not in the classrooms.

Water - Plumbing

1. Ensure all plumbing and/or intrusion (i.e., roof) leaks are reported and repaired immediately.
2. Convert as funds permit existing fixtures to water saving fixtures, i.e., push button faucets for basins, waterless urinals, low volume flush valves, .6 gpm's, for lavatories and drinking fountains to be push button, low volume.
3. For New Construction - only low volume, water saving fixtures are to be specified and installed, i.e., push button faucets for basins, waterless urinals, low volume flush valves, for lavatories .6 gpm's, push button devices for drinking fountains.

Water - Irrigation

1. Grounds watering during the months of April – October, shall occur between the hours of 9:00PM – 9:00AM; during the months of November – March shall occur between the hours of 7:00PM – 9:00 AM. Do not water during the heat of the day, typically between 10am – 7pm.
2. The District shall manage automatic irrigation with a centrally controlled, weather-based system, using seasonal evapotranspiration rates to maximize water conservation, incorporating flow sensors and master valves to compliment the Central control system, disabling the system when unscheduled or excessive flow occurs, and sending an alarm reporting to the Irrigation Technician of shut down.

3 When spray irrigating, ensure the water does not directly hit the facility or spray onto the adjacent hardscape areas. Large turf (athletic fields) areas, front lawns, and planter beds infiltration rate is to be determined/measured and program irrigation to ensure water runoff is minimized by programming more but shorter run times, if deemed necessary.

4. Relieve compaction in turf areas by aerating to improve water infiltration, encouraging deep root growth and ultimately reducing water consumption by the turf.
5. Install a minimum of 4" of mulch in planter beds to provide various benefits: reduction of water loss through evapotranspiration, through the soil; reduction of unwanted vegetation, minimizing the need for chemical or mechanical weed abatement; encouraging a symbiotic relationship between the top layer of soil and the bottom layer of mulch, as it breaks down, providing nutrients to the plants.
6. Existing landscape (spray head) irrigation shall be converted to low volume (drip or point source) irrigation, when renovation funding is available. New landscape irrigation shall be specified and installed per AB 1881 and PWP requirements.
7. Separate water meters irrigation from domestic and install sub water meters for cooling tower supply lines to eliminate sewer charges.
8. Harvest gray water, storm water, and rain water as forms of conserving water diverting potential runoff into the Los Angeles River by recycling and reusing in the landscape. When funding permits, install cisterns to store the diverted runoff.

Landscaping

1. Landscaping is to be energy efficient for the purpose of conserving energy and water.

2. Drought tolerant plants, native plants, xeriscape, water-wise gardens and plants that can withstand our seasons with minimal irrigation shall be used.

3. The embedded energy of materials and constructing the landscape, and the energy consumed by the maintenance and operations of a landscape, are to be considered.

4. Design techniques may include:

   - Planting trees for the purpose of providing shade, which reduces cooling costs.

- Planting or building windbreaks to slow winds near buildings, which prevents heat loss.
- Wall sheltering, where shrubbery or vines are used to create a windbreak directly against a wall.
- Earth sheltering and positioning buildings to take advantage of natural landforms as windbreaks.
- Green roofs that cool buildings with extra thermal mass and evapo-transpiration.
- Reducing the heat island effect with pervious paving, high albedo paving, shade, and minimizing paved areas.
- Site lighting with full cut-off fixtures, light level sensors, and high efficiency fixtures

5. Other energy-efficient landscaping techniques to consider are using local materials, on-site composting and chipping to reduce green waste hauling for onsite use, hand tools instead of gasoline-powered, and also may involve using drought-resistant plantings in arid areas, buying stock from local growers to avoid energy in transportation, and similar techniques.

6. Develop a school garden composting installation at John Muir High School Ranch which will produce quality compost for school garden compost from school cafeteria waste, and green waste to meet the needs of the PUSD school gardens. This will ensure that PUSD school garden programs will have a locally produced product of high quality for the school garden programs required to improve student health and reduce childhood obesity.

7. Incorporate the Engineering and Environmental Science Academy at John Muir High School Ranch as the district-wide plant and seed supplier to the other schools vegetable gardens.

- Muir Ranch will provide donated vegetable and plant plugs to PUSD schools.
- Muir Ranch will propagate drought-resistant plants for PUSD schools landscaping.

ENERGY AND WATER MANAGEMENT CONSERVATION

Water – Car Washes on Campus or District Grounds

1. All events will be held on Tuesday, Thursday or Saturday only.
   (Pasadena Water and Power directive)

2. Only hoses with shut-off nozzles will be used.
   (Pasadena Water and Power directive)

3. Water must be contained in buckets.
   (Pasadena Water and Power directive)

4. A credentialed staff member or administrator MUST be present at all times.
   (Pasadena Unified School District directive)

5. Only a credentialed staff member, administrator or vehicle owner can operate any and all vehicles.
   (Pasadena Unified School District directive)

6. Time limits for such events are set for 26 hours per month per school site.
   (Pasadena Unified School District directive)

7. Local businesses will be encouraged to provide locations for car washes.

Solid Waste Reduction & Recycling

1. The District shall follow the City of Pasadena's goal for zero waste by the year 2040.

2. Each school site shall implement a recycling program with leadership from secondary science departments, including students as the program operators (project based learning), potentially generating revenue (intern hours required for graduating), to further support classroom instruction.

3. A system of three (3) waste cans will be implemented which will allow the students to presort waste into RECYCLE for glass, plastic and aluminum bottles and cans, COMPOST for cafeteria organic waste, and LANDFILL for waste that cannot be recycled or composted.

3. Food Service and Custodial staffs are important participants to ensure separation of various materials not being placed in the trash dumpsters, including, paper, cardboard, plastic, aluminum and food waste. Food waste can be relocated to an on-site composting area to be used on site as soil amendment for the school's vegetable garden.

4. Grounds staff are to maintain the landscaped grounds to divert green waste from entering the local landfill by keeping shrubs trimmed regularly, allowing the shrub cuttings to lay on the mulch, becoming part of the mulch; chip tree trimmings and return as mulch into the school planter beds; use recycling blades on the power mowers when mowing the grass to a fine matter to break down and feed the turf.

4. Diverting solid waste from the local landfill will result in reducing dumpsters on each site, including less frequent daily visits by the trash hauling contractor.

Emergency Interruption of Services

The Superintendent or designee shall develop a plan to address actions to be taken in the event of power outages or other emergency interruption of utility services, both during and after school operations. The plan shall address procedures to help ensure student and staff safety, administrative control of operations, protection of equipment, effective communications, and coordination with local fire, police, and utility service providers.

(cf. 0450 - Comprehensive Safety Plan)
(cf. 3516 - Emergencies and Disaster Preparedness Plan)
(cf. 3516.5 - Emergency Schedules)