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INTRODUCTION 1800

Revised 9/2016

Energy and Sustainability

This State Administrative Manual (SAM) chapter provides the policies and guidelines put in place pursuant to the Green Building Action Plan accompanying Executive Order B-18-12. In partnership with other state agencies, the Department of General Services ((DGS) develops policies and guidelines for the operation and maintenance of state buildings to achieve operating efficiency improvements and water and resource conservation, and continually incorporates them into SAM.

The DGS Office of Sustainability develops and implements clean energy strategies and programs for state buildings. State departments strive to lead by example in advancing clean energy and sustainability goals in the state. The office supports state departments in this goal with programs that include clean renewable energy projects, energy retrofit projects/programs, zero net energy (ZNE) building policy development, electric vehicle charging infrastructure development, LEED certification support and state buildings benchmarking. See SAM section 1802 for more details.

DEFINITIONS 1801

(New 8/2014)

For definitions of terms used in this SAM Chapter, please refer to the Green California glossary.

ENERGY AND SUSTAINABILITY PROGRAM 1802

(Revised 09/2016) (Renumbered from 1325)

The Energy and Sustainability Program provides research and project implementation for green and sustainable projects and buildings. The program's mission is to progressively move state agencies towards compliance with the Administration's sustainability initiatives.

- **Clean Renewable Energy Projects** – Consultation and management of projects involving clean renewable energy sources including solar photovoltaic systems and wind turbines.

- **Power Purchase Agreement (PPA) Programs** – Statewide program that provides clean renewable on-site solar and wind energy that does not require up-front capital and generally costs less than grid-based energy.

- **Energy Retrofit Projects/Programs –** Statewide program that offers a no up-front capital, budget-neutral opportunity to participating agencies to reduce their electricity, gas and water consumption while addressing deferred maintenance and improving the environment of state facilities.

- **Zero Net Energy (ZNE) Building Program** – Project consultation program where a new or existing building is designed to produce as much on-site energy as it consumes over the course of a year.

- **Electric Vehicle Charging Program** – Consultation and management of projects for the installation of electric vehicle charging stations.

- **State/Investor-Owned Utility (IOU) Partnership Liaison** – Liaison with the IOU companies regarding incentive programs, Demand Response (DR), grid stability, and renewable energy interconnections.

- **LEED and Sustainability** – Consultation on achieving LEED building certification and other sustainable measures.

STANDARD OPERATING PROCEDURES FOR ENERGY MANAGEMENT IN STATE BUILDINGS 1805

(New 8/2014)

The intent of this section is to announce policy and guidelines regarding efficient energy management in state buildings during normal operations.

POLICY 1805.1

(Revised 8/2015)

All state agencies shall follow the *Standard Operating Efficiency Procedures* for managing energy usage in state-owned buildings and, as practical, in state-leased buildings. Department directors or their designees shall designate energy coordinators for each location their department occupies. Energy coordinators are responsible for ensuring that the Standard Operating Efficiency Procedures are carried out to the extent that funding is available and they do not conflict with health and safety requirements or operations necessary for a department to fulfill its mission and responsibilities.

For the comprehensive policy see Management Memo 14-07: Standard Operating Procedures for Energy Management in State Buildings.

AUTHORITY **1805.2**
(New 8/2014)

Executive Order B-18-12 requires that state agencies:

1. Take measures toward achieving Zero Net Energy for 50 percent of the square footage of existing state-owned building area by 2025;
2. Take measures to reduce grid-based energy purchases for state-owned buildings by at least 20 percent by 2018, as compared to a 2003 baseline, and reduce other non-building, grid-based retail energy purchases by 20 percent by 2018, as compared to a 2003 baseline; and
3. Participate in “demand response” programs to obtain financial benefits for reducing peak electrical loads when called upon, to the maximum extent that is cost-effective for each state-owned or leased facility, and does not materially adversely affect agency operations.

To meet the Executive Order requirements, state agencies must ensure that they are operating at a high standard level of operating efficiency. This SAM section outlines Standard Operating Efficiency Procedures to ensure efficient energy management in state buildings during normal operations, helping to achieve the Executive Order requirements.

STANDARD OPERATING EFFICIENCY PROCEDURES **1805.3**
(New 8/2014)

State departments shall follow the Standard Operating Efficiency Procedures described below, to the extent that funding is available and they do not conflict with health and safety requirements or operations necessary for a department to fulfill its mission and responsibilities.

Department directors or their designees shall designate energy coordinators for each location their department occupies. Energy coordinators are responsible for ensuring that the Standard Operating Efficiency Procedures are carried out, except as noted above.

Throughout this section, the term “facility manager” is used. Depending on the structure of the individual facility, the “facility manager” may be the building operator, property manager, or another employee. Other titles may include staff services manager, business services assistant, office building manager, real estate officer, associate business management analyst and associate governmental program analyst. State agencies are responsible for identifying the appropriate party or designee to implement all procedures indicated.

General Requirements

1. At the end of the workday or when not needed, employees shall turn off all lights and equipment in their work space, except for equipment designated as 24/7 or for which there is a specific need for after-hours operations (e.g., email servers, fax machines or other essential equipment). Facility managers are encouraged to install reminder labels.

2. If occupancy controls are not used in common areas, facility managers or appropriate designees shall turn off all equipment and non-emergency lighting at the end of the workday or when not needed.

3. Information Technology managers or appropriate designees shall enable the automatic power-down or “Energy Saver” feature on all computers, copiers, printers, and other electrical equipment, consistent with IT Policy Letter 10-09 and subsection 12 of the State Administrative Manual Section 4819.31.

4. When purchasing equipment, state agencies shall purchase the most energy efficient ENERGY STAR rated equipment that is practical, considering Environmentally Preferable Purchasing principles.

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STANDARD OPERATING EFFICIENCY PROCEDURES **1805.3** (Cont. 1)
(New 8/2014)

Hours of Operation

Typically, state-owned and leased buildings will be operational from 6:00 AM through 6:00 PM Monday through Friday (excluding facilities that are designated as 24/7 or continuously operational). All non-essential lighting and other electrical loads shall be minimized outside of normal building hours. State agencies are expected to make a reasonable determination as to what functions must continue outside of these hours.

Building Heating and Cooling Systems

1. Facility managers shall allow building temperatures to fluctuate within an acceptable range to avoid wasteful over-control patterns. This range may vary with each building's control system; the target range is plus or minus two degrees Fahrenheit from the temperature set point, for a total fluctuation of four degrees Fahrenheit. The temperature set point should be no higher than 68°F in winter and no lower than 78°F in summer; unless such a temperature in a particular job or occupation may expose employees to a health and safety risk. Simultaneous or alternate heating and cooling operations to maintain exact temperature in work areas shall be avoided.

2. Whenever practical, facility managers shall operate and adjust controls to get optimum advantage from outside temperatures for meeting cooling demand (e.g., using outside air economizers and night flush cycles). Avoid operating chillers and compressors when possible. All "pre-cooling" options for buildings shall be employed.

3. State employees are prohibited from using personal heaters without the express written consent of the facility manager or an approved reasonable accommodation request.

4. State employee shall keep windows and doors closed to prevent loss of heated or cooled air, unless the facility manager has indicated that the building is specifically designed for natural ventilation efficiency.

5. State employees in state-occupied locations shall adjust window blinds or coverings, if installed, to prevent solar heat gain during summer and prevent heat loss in winter.

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STANDARD OPERATING EFFICIENCY PROCEDURES **1805.3** (Cont. 2)
(New 8/2014)

6. Facility managers shall order data center operators to maintain ambient temperature settings at manufacturer specification maximums.

7. Facility managers shall not set domestic hot water temperatures above 105° F unless this conflicts with a code requirement for the facility. Facility managers and state employees in state-occupied locations shall take every opportunity to minimize hot water usage.

Year-Round Maintenance

1. Facility managers shall inspect and maintain ducts, air filters, and related hardware to maximize effectiveness at the lowest acceptable power use.

2. Facility managers shall tune up all forced and induced draft gas and oil-fired boilers at least twice annually. If there are automated combustion controls, verification of combustion efficiency shall be conducted at least twice annually.

Lighting

1. State employees in state-occupied locations shall turn off all lights in unoccupied rooms. Facility managers shall install occupancy sensors whenever practical. Occupancy sensors shall be selected to be appropriate to the room geometry and usage patterns of the space. When areas served exceed 10,000 square feet, occupancy sensors should undergo quality assurance testing included in building systems that are commissioned.

2. Facility managers shall reduce lamps and/or luminaires in number and/or wattage to provide the lighting level appropriate for the activities of the work area affected.

3. Facility managers shall replace any incandescent lighting with higher efficiency sources, such as fluorescent, high intensity discharge (HID), light-emitting diode (LED), or induction lighting whenever replacement is required.

4. For fluorescent lights, facility managers shall have a plan by December 2015 to replace any older “core and coil” magnetic ballasts with newer energy-efficient electronic ballasts.

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STANDARD OPERATING EFFICIENCY PROCEDURES **1805.3** (Cont. 3)
(New 8/2014)

5. Facility managers shall install some form of daylight controls in day-lit zones (near windows and under skylights). When such day-lit areas exceed 10,000 square feet, or are part of new construction or a major renovation, these day lighting controls (e.g., sensors that adjust artificial lighting in response to the available natural light) should be included in building systems that are commissioned.

6. Where practical, facility managers shall consider the significant energy savings made possible by the selection of lower level general ambient lighting with small-area, high-efficiency fluorescent or LED task lighting for higher level task lighting requirements – an approach particularly appropriate for work stations and computer use areas.

7. When painting or renovating, use light colored ceiling, wall, floor and desk surfaces throughout building to boost overall ambient illumination levels (dark surfaces absorb light). Keep lighting fixtures clean to maintain lighting levels.

8. Facility managers shall have custodial personnel turn lights on only as needed and turn lights off when their work is done. Where practical, have custodial personnel work in teams to complete cleaning on each floor of multi-story buildings.

<u>Plug Loads</u>

1. State employees shall not plug in any personal devices, including but not limited to coffee pots, microwaves, refrigerators, and heaters, in workspaces. Exception: the following may be allowed if the facility manager determines that the circuit can safely accommodate the electrical load:
   a) Cell phones and tablets;
   b) Task lighting that is UL approved and does not use incandescent or halogen bulbs.

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STANDARD OPERATING EFFICIENCY PROCEDURES **1805.3** (Cont. 4)
(New 8/2014)

2. Facility managers shall work with employees and vendors to ensure that all equipment in employee kitchens, lunch rooms, and other shared spaces complies with the following:
   a) Additions of new equipment must have a current ENERGY STAR rating, when available;
   b) As practical, strive to replace refrigerators and equipment manufactured prior to 2000 with more efficient models;
   c) Refrigerated beverage vending machines and hot/cold water dispensers that are purchased, leased, or supplied by an outside vendor must be ENERGY STAR rated to the current version, when available;
   d) All vending machines with non-perishable items must comply with one of the following:
      - Have built-in low power modes for lighting and refrigeration, as applicable and described in ENERGY STAR program requirements for refrigerated beverage machines, version 3.0, section 3(B); or
      - The facility manager has installed an after-market occupancy sensor.
   e) Coffee makers must shut off automatically;
   f) Equipment must be regularly cleaned and maintained to optimize efficiency.

3. Facility managers shall install power strips with timer settings and/or inexpensive, energy-efficient timers to turn off equipment during non-work hours (including paper shredders, lighted ambient snack vending machines, and hot/cold water dispensers). In implementation of this section, facility managers shall follow any applicable procurement guidelines established for such equipment.

4. Department directors or their designees shall distribute an annual email to educate all employees about the importance of minimizing electrical plug loads and to review relevant state policies and guidelines.

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STANDARD OPERATING EFFICIENCY PROCEDURES **1805.3** (Cont. 5)
(New 8/2014)

Demand Response

Facility managers should be proactive in contacting their local utility to research the various demand response programs and select appropriate options, when applicable. When an electrical emergency is predicted for the day, the facility manager shall alert state employees and building operations in anticipation of the emergency, and shall implement curtailment measures immediately upon or before the emergency declaration.

In facilities with appropriate energy management systems installed, automated demand response should be considered.

RESOURCES **1805.4**
(New 8/2014)

1. Plug Load Best Practices Guide: Managing Your Office Equipment Plug Loads, New Buildings Institute.

2. Commercial Plug Load Energy Use Policy: What's in Place, Pending and Possible, New Buildings Institute, April 2013.

3. Plug Load Control, U.S. General Services Administration, September 2012.

4. Assessing and Reducing Plug and Process Loads in Office Buildings, National Renewable Energy Laboratory, April 2013.

PROCEDURES FOR ENERGY MANAGEMENT IN STATE BUILDINGS DURING ELECTRICAL EMERGENCIES 1810

(New 8/2014)

The intent of this section is to provide information regarding actions state agencies shall take to control energy usage during electrical emergencies.

POLICY 1810.1

(Revised 8/2015)

State agencies shall designate personnel to receive Department of General Services (DGS) Electrical Emergency Notifications (EENS) list server. Additionally, state agencies shall incorporate the procedures for electrical emergencies into their departmental Emergency Plans.

For the comprehensive policy see Management Memo 14-09: Energy Efficiency in Data Centers and Server Rooms.

AUTHORITY 1810.2

(New 8/2014)

Executive Order B-18-12 mandates that state agencies participate in "demand response" programs to obtain financial benefits for reducing peak electrical loads when called upon, to the maximum extent that is cost-effective for each state-owned or leased facility, and does not materially adversely affect agency operations.

Federal law requires that the California Independent System Operator (CAISO) maintain specified levels of energy reserves available to the electrical grid. When reserves reach dangerously low levels because electrical demand is high, the CAISO may declare a Stage 1 Electrical Emergency to bring about a reduction in demand. The CAISO can escalate the emergency to Stage 2 and then Stage 3 if curtailment measures do not successfully reduce demand. Finally, the CAISO may use rotating outages to balance the demand for electricity to the available supply.

ELECTRICAL EMERGENCY NOTIFICATION SYSTEM (EENS) **1810.3**
(New 8/2014)

The DGS EENS Manager will use email to notify all parties that have registered for the EENS list server on the EENS Web page.

All state agencies should have one or more persons from each state-owned or state leased facility subscribe to the list server so they can receive electrical emergency notifications. It is the responsibility of the agencies to update the contact e-mail addresses on the list server as required.

For information on the EENS system, copies of energy instruction documents, and additional energy conservation information and links, please send an e-mail to EENS@dgs.ca.gov .

The DGS Real Estate Services Division periodically conducts tests of its notification system. The test messages will also contain information on how to update agency contact information.

PROCEDURES FOR ELECTRICAL EMERGENCIES **1810.4**
(New 8/2014)

The DGS Real Estate Services Division will alert departments, universities, and community colleges when the CAISO declares a Stage 1, 2, or 3 Electrical Emergency and when those Stages are cancelled.

This table contains links to documents that provide detailed instructions on controlling energy usage. The energy management practices of all state agencies should conform to these procedures.

Emergency Status	Link to Procedures
Stage 1 Electrical Emergency	Curtailment Measures
Stage 2 Electrical Emergency	
Stage 3 Electrical Emergency	
Rotating Outage or Blackout	Safety Tips During Outages and Blackouts Emergency Preparedness

State agencies should print a copy of these procedures and incorporate them in departmental Emergency Plans in order to be prepared for an electrical emergency.

Based on operational needs, some departments may need to employ conservation measures that are more or less restrictive. Department energy management personnel must communicate department-specific instructions to the appropriate staff.

DEMAND RESPONSE **1810.5**
(New 8/2014)

Executive Order B-18-12 mandates that state agencies participate in "demand response" programs to obtain financial benefits for reducing peak electrical loads when called upon, to the maximum extent that is cost-effective for each state-owned or leased facility, and does not materially adversely affect agency operations.

State agencies should be proactive in contacting their local utility to research the various Demand Response programs and selecting an appropriate option, when applicable. When an electrical emergency is predicted for the day, the agency should prepare the occupants and operations in anticipation of the emergency and implement curtailment measures immediately upon or before the emergency declaration.

In facilities with appropriate energy management systems, Automated Demand Response should strongly be considered.

RESOURCES **1810.6**
(New 8/2014)

1. California Energy Alert

2. Department of Personnel Administration Employee Leave and Safety during Rolling Blackouts, January 23, 2001

ENERGY USE REDUCTION FOR NEW, EXISITING, AND LEASED BUILDINGS 1815

(New 5/2015)

The intent of this section is to announce policy and guidelines for all state agencies to reduce and report energy use.

POLICY 1815.1

(Revised 8/2015)

All state agencies shall achieve targets and timelines for energy use reductions established in Executive Order B-18-12 and the Green Building Action Plan for buildings they design, build, manage, or lease.

- Agencies shall include their strategies and procedures to achieve these targets in their existing building infrastructure plan updates.
- Agencies shall enter all energy consumption data into the ENERGY STAR® Portfolio Manager® annually, by March 1. As agencies automate their meters, this information will be collected monthly.

For the comprehensive policy see Management Memo 15-04: Energy Use Reduction For New, Existing, And Leased Buildings.

AUTHORITY 1815.2

(New 5/2015)

This management memo is executed under the Governor's executive authority established in Executive Order B-18-12 and the Green Building Action Plan.

REQUIREMENTS FOR NEW, EXISTING, AND LEASED BUILDINGS **1815.3**
(New 5/2015)

1. **New Buildings and Renovations**
    a. All new building and renovation project computer modeling, reports, and other related documentation prepared as part of the design process shall become the property of the state once the project is closed out and/or has received an occupancy permit.
    b. All new building and renovation projects shall be designed and constructed to exceed by 15 percent the applicable version of the Title 24, Part 6, Building Energy Efficiency Standards.
    c. All new building and renovation projects *less than* **10,000 gross square feet of building area (gsf)** shall meet or exceed project applicable Title 24, Part 11, California Green Building Standards Tier One requirements.
    d. All new building and renovation projects **larger than 5,000 gsf** *and* **exceeding an energy use intensity (EUI) of 50,000 British thermal units (BTU)/gsf**, *or* **larger than 10,000 gsf** shall be commissioned in accordance with Leadership in Energy and Environmental Design (LEED) requirements and California Title 24, Part 6, Energy Efficiency Standards that are in effect at the time.
    e. All new building and renovation projects **larger than 10,000 gsf** shall:
        i. Install and operate all design-appropriate and economically feasible clean, onsite power generation including, but not limited to solar photovoltaic, solar thermal, and wind power generation including clean backup power supplies.
            1. To the extent possible, explore methods of alternative financing including but not limited to power purchase agreements (PPAs) or other mechanisms to fund, install, and/or manage on-site renewable energy generation.
        ii. Obtain LEED Silver or higher certification using the version of LEED that is in effect at the time the project schematic design documents are initiated by the state agency. Certification to an equivalent or higher rating system or standard (if any) is acceptable only when approved by the Sustainability Task Force.
    f. All new building and renovation projects that are authorized to begin the schematic phase of design on or after **January 1, 2020, and before January 1, 2025,** shall be constructed as zero-net-energy (ZNE) facilities, **unless** the department has achieved the goal of at least 50 percent of new building and renovation projects during that period being ZNE. All new building and renovation projects that are authorized to begin the schematic phase of design on or after **January 1, 2025,** shall be constructed as zero-net-energy (ZNE) facilities.

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REQUIREMENTS FOR NEW, EXISTING, AND LEASED BUILDINGS **1815.3** (Cont. 1)
(New 5/2015)

g. All new buildings and renovation projects shall include an Energy Management Systems (EMS) with a training program for energy management and maintenance staff; or shall include an Energy Management Plan.

2. Existing Buildings

a. **Before January 1, 2016, all existing buildings over 50,000 gsf** shall complete LEED for Existing Building Operations and Maintenance (LEED-EBOM) certification. Buildings shall meet or exceed an ENERGY STAR rating of 75, to the maximum extent cost-effective.

b. **For calendar year 2018 or before**, all state agencies shall take measures to reduce annual grid-based energy purchases for existing buildings by 20 percent, compared to a 2003 calendar year baseline. Total grid-based energy purchases shall be calculated in equivalent thousand British thermal units (kBtu) when compared to purchases in calendar year 2003 for all forms of energy provided (for example, electricity, natural gas, propane, and any other forms of energy) according to Table 1 below.

Table 1: Site Energy kBtu Conversion

ENERGY TYPE	ENERGY UNIT	SITE ENERGY CONVERSION
Electricity	1 kilowatt hour	3.412 kBtu
Natural Gas	1 therm	99.976 kBtu
Propane	1 gallon	95.500 kBtu

i. Agencies shall enter current energy use data into the ENERGY STAR Portfolio Manager database, including electricity, natural gas, propane, on-site renewable energy, and any other forms of energy. Onsite renewable energy generated counts toward energy reductions and is not included in total energy purchases.
   1. Online access to the ENERGY STAR Portfolio Manager database shall be provided to DGS.
   2. Retail electricity purchases for water management activities directly associated with water conveyance and flood control are excluded.

ii. Agencies shall set up automated energy data transfers from their utility into the ENERGY STAR Portfolio Manager database, if available from their utility.

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REQUIREMENTS FOR NEW, EXISTING, AND LEASED BUILDINGS **1815.3** (Cont. 2)
(New 5/2015)

c. **Before January 1, 2025**, all state agencies shall take measures toward achieving ZNE for at least 50 percent of total state-owned building area (gsf) that they manage. Agencies shall:
   i. Reduce non-facility energy use (including plug loads affected by building occupant behaviors, computers, equipment and appliances).
   ii. Assess feasibility, methods, and mechanisms to install on-site renewable energy to generate as much energy over a year as all combined sources of energy used on the site during the same year.
   iii. To the extent possible, explore methods of alternative financing including, but not limited to energy service companies (ESCOs), on-bill financing, GS-$Mart, and PPAs.
d. **By December 31, 2016**, all state agencies shall participate in all available demand response power supply programs designed to reduce peak electrical loads when such programs do not adversely affect state agency building operations, occupant performance or indoor environmental quality.
e. Existing buildings shall incorporate building commissioning to facilitate improved and efficient building operations as set forth in Table 2 below.

Table 2: Building Commissioning Criteria For Existing State Buildings

Building Type	Building Area (gsf)	EUI (kBtu/sq. ft)	Required Commissioning
All existing state buildings	>50,000 gsf	EUI > 20	Monitoring-based commissioning (MBCx)
	>5,000 gsf	EUI > 100	MBCx
Metered state buildings	>10,000 gsf	EUI > 30	MBCx

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REQUIREMENTS FOR NEW, EXISTING, AND LEASED BUILDINGS **1815.3** (Cont. 3)
(New 5/2015)

3. Building Leases

a. All state agency build-to-suit leases shall be designed and constructed to meet the requirements of Section 1 above for New Buildings and Renovations.

b. All new and renegotiated state building leases shall encourage lower than industry-standard energy and other resource use to the extent possible and economically feasible. These leases should also encourage landlords to participate in available utility programs that offer financial incentives and alternative financing to cover energy efficiency measure and renewable power system incremental costs.

c. All new state building leases shall, where economically feasible, require the use of submeters for gathering energy use data as needed to complete ENERGY STAR Portfolio Manager reports.

d. Renegotiated state building leases for buildings, where the state is a sole tenant, shall provide energy use data, if possible, for completing ENERGY STAR Portfolio Manager energy use evaluations and for benchmarking reports.

e. All state-leased facilities shall participate in cost-effective demand response power supply programs designed to reduce peak electrical loads, if available, without adversely affecting state agency building operations, occupant comfort and performance, or indoor environmental quality requirements outlined in the State Administrative Manual (SAM), Sustainable Operations and Practices Ch. 1800.

ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS 1815.31

(New 10/2017)

Purpose

This policy was outlined in Management Memo 17-04 and provides state agencies and building professionals with the requirements for meeting zero net energy (ZNE), as well as the direction, strategies and procedures that will help them achieve ZNE for new building design and construction, and build-to-suit leases, as well as existing state-owned buildings.

This policy is part of a series of directives to state agencies designed to implement the Governor's Executive Order (EO) B-18-12 on energy and resource conservation in state buildings.

Policy

Executive Order B-18-12 requires the following actions to reduce the environmental impact of state facilities on climate change:

- All new State buildings and major renovations beginning design after 2025 shall be constructed as Zero Net Energy facilities.
- 50% of new facilities beginning design after 2020 shall be Zero Net Energy.
- State agencies shall also take measures toward achieving Zero Net Energy for 50% of the square footage of existing State-owned building area by 2025.

To facilitate achieving these goals the following shall apply:

- All new state buildings, major renovations, and build-to-suit leases beginning design after October 23, 2017, shall be designed and built following cost-effective energy efficiency strategies for achieving ZNE identified below.
- Departments shall work to improve energy efficiency in existing buildings in the most cost cost-effective manner to meet or exceed energy efficiency targets established in energy efficiency strategies for achieving ZNE identified below.
- Renewable energy generation shall be added to state facilities either onsite, and/or offsite to achieve EO B-18-12 targets by following renewable energy generation prioritization and strategies identified below.

Reporting Requirements

Energy use reporting is already required monthly into the ENERGY STAR Portfolio Manager database (see SAM chapter 1815.4). Departments shall also provide status on compliance with this policy in their department *Sustainability Road Map*.

Definition of Zero Net Energy (ZNE)

ZNE Source *– Energy Efficient building that produces as much clean renewable energy as it consumes over the course of a year, when accounted for at the energy generation source.*

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ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS **1815.31**
(New 10/2017 - Continued)

Definition of Zero Net Energy (ZNE) (continued)

Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all fuel extraction, transmission, delivery, and production losses. By taking *all* energy use into account, the ZNE definition provides a complete assessment of energy used in buildings.

Definitions of other terms can be found in the Green California Glossary.

Energy Measurement and Calculation

Measurement of source energy converts all energy sources into common units of *Source kBtu* using established conversion factors for each energy source. Energy use quantities are included in the Energy Star Portfolio Manager reporting[1]. Source energy conversion factors shall be applied to energy metrics from all energy sources, including district energy and renewable energy and shall be based on national averages in ASHRAE Standard 105-2014[2]. They are also included in a *ZNE Calculator* for State Buildings. Energy used for Zero Emission Vehicle charging or fueling is excluded from building total energy for ZNE calculations.

State agencies shall utilize the following strategies to achieve ZNE at state facilities whenever possible and cost-effective to ensure the highest output and efficiency possible, reduce long-term operating budgets and reduce or avoid any uneconomical over-generation of renewable energy:

1. **Energy Efficiency** – Ultra-low energy use through energy conservation, passive systems and whole-building integrated energy efficiency measures should always be the initial focus for each building pursuing ZNE.
    a. **New Construction, Major Renovations and Build-to-Suit Leases** – All new projects shall exceed the applicable version of California code (California Code of Regulations, Title 24, Part 6), by fifteen percent or more. (This is already required by EO B-18-12 and identified in its Green Building Action Plan)
        - Build-to-suit leases apply where the state will likely become the eventual owner of the building, and the state is the sole tenant.

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[1] State agency and facility energy use is posted on the governor's green building website, and will eventually include energy efficiency metrics and ZNE data.
[2] ASHRAE Standard 105-2014, Table J2A. Primary Energy Conversion Factors for National Comparisons

ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS **1815.31**
(New 10/2017 - Continued)

Energy Measurement and Calculation (continued)

- All new projects should design and construction facilities to maximize efficiency, and accommodate on-site renewable energy to the extent feasible and cost-effective, whether onsite renewables are installed with new project, or at a later date. This may include site orientation, massing, layout, landscape design, roof design and orientation, and mechanical/electrical room layouts. If onsite renewable energy is not possible, or feasible, other renewable energy generation strategies may be utilized (see Renewable Energy Generation categories below.)
- Design and install conduits and chases for eventual wiring and plumbing required for connecting site and/or building renewable energy systems to mechanical/electrical rooms.
- Departments with decision-making authority are responsible to implement energy efficiency measures into all new construction and major renovation projects, and meet energy efficiency targets, or exceed them to the extent cost effective. The Department of General Services (DGS) is responsible for implementing these measures into buildings for Departments without this authority.
- All departments are responsible to conserve energy to the extent feasible, through procurement of energy-efficient office equipment, and other measures identified in SAM Section 1805.3 – Standard Operating Efficiency Procedures.
- A ZNE Decision Making Matrix for State Agencies helps identify measures and responsibilities of owners, tenants of new and existing state buildings pursuing ZNE.

b. Existing Buildings – Existing state buildings should strive to achieve high levels of energy efficiency before adding renewable energy to achieve ZNE. While state agencies are required to take measures toward achieving ZNE on 50 percent or more of their building area, they should work to achieve high energy efficiency levels in their entire portfolios to the extent cost effective.

- Energy efficiency for ZNE is to be measured using Source Energy Use Intensity (Source EUI), and uses the following units of measurement – **kBtu/sq. ft. Source** (thousand British thermal units per square foot of building area). This metric can currently be extracted from the Energy Star Portfolio Manager in a report, but can also be calculated using the ZNE Calculator.

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ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS **1815.31**
(New 10/2017 - Continued)

Energy Measurement and Calculation (continued)

- Energy efficiency targets for existing state buildings are derived from 2015 historic state-owned building energy data and some national data. These energy efficiency targets are established as the top quartile of energy use for each building type. For some building types (i.e. offices & other types) EUI targets are established for some specific state occupancies, as well. This accounts for variations from differences in occupancy, hours of use, equipment, etc.
- Source EUI targets for Existing State Buildings are all listed in the linked table and includes variations for each of the 16 California Climate Zones. These are soft EUI targets that state agencies should attempt to achieve for buildings or facilities pursuing ZNE. They are intended as a guide, as some circumstances may vary affecting the feasible achievability of some targets.
- Energy use reduction in existing buildings can be achieved through a variety of measures including:
    - Upgrading lighting systems and controls to more efficient systems
    - Upgrading heating, ventilation and air conditioning (HVAC) systems and/or controls for improved efficiency
    - Improving thermal performance of building envelope (insulation, glazing, roofing, etc.)
    - Reducing plug loads by improving efficiency of equipment and appliances used in building (see SAM chapter 1805)
    - Energy conservation measures of occupants
    - Retro-commissioning and monitoring-based commissioning, as required and outlined by SAM Section 1815.3
    - The DGS Energy Efficiency Retrofit Program provides support for state departments on energy efficiency upgrades utilizing ESCo's, and other alternative financing options.
- A ZNE Decision Making Matrix for State Agencies helps identify measures and responsibilities of owners, tenants of new and existing state buildings pursuing ZNE.

(Continued)

ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS **1815.31**
(New 10/2017 - Continued)

Renewable Energy Generation

In addition to achievement of energy efficiency targets, renewable energy must be generated and used to offset the annual energy use of the facilities achieving ZNE. Renewable energy generation should come from the following sources, as much as possible in the priority listed (a through d below), but can include a combination of the following approaches. In all cases Renewable Energy Credits (RECs) must be retired (not sold to other customers) for all renewable energy systems.

a. Building – Generate and use renewable energy on-site to the extent possible and cost-effective.
- This can utilize rooftops, or the building site (parking lot, adjacent land) for on-site renewable generation.
- On-site systems can be purchased as part of projects, procured through Power Purchase Agreements (PPA's), or through other means. DGS provides assistance procuring PPA's through its Clean Energy Generation Program.
- It is strongly advised that all on-site renewable energy system procurement include services for operation and maintenance to assure that system operation and generation persists for the life of the equipment.

b. Campus – Generate and use renewable energy within a multiple building campus to the extent possible.
- This can utilize rooftops, or the building or campus site (parking lot, adjacent land, common areas) for on-site renewable generation.
- Advantages of campus generation include that excess renewable energy generation, above the amount of the building(s) achieving ZNE can be used to offset other campus loads.

c. Portfolio – Generate and use renewable energy within an owner's portfolio to the extent possible.
- Multiple building sites by the same owner could be used and aggregated so that the combined on-site renewable energy could offset the combined building energy from the aggregated building sites. This could apply to the entire portfolio, or portions of the portfolio.
- This approach would allow ZNE to be achieved for energy-efficient buildings within the portfolio where the capacity for on-site renewable energy is very restricted. While preferable, it is not required that renewable generation using the portfolio approach be in the same utility grid as the building achieving ZNE.

(Continued)

ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS 1815.31
(New 10/2017 - Continued)

- This approach may require a cooperative agreement with the utility, and could also provide an outlet for excess renewable energy production during periods of the day when over-generation of electricity is likely, to avoid financial losses from selling back excess energy wholesale to utilities.

d. Community – Generate renewable energy within the state for use at the facility, after other feasible options have been exhausted to the extent possible.

- This could be applied to allow long-term purchase agreements of state-generated, renewable energy, dedicated to providing energy for the building(s). Agreements should extend a minimum of 20 years, and must specify that the RECs are owned by the electricity customer and retired by the utility.
    - Some utilities may offer customers the opportunity to enter a long-term contract to purchase renewable energy from the utility for some portion of the energy used at the site. The contract must be for at least 20 years and must specify that RECs are owned by the electricity customer and will be retired by the utility.
- Short-term RECs would not be allowed to be counted toward achievement of ZNE, while they are still effective to reduce GHG emissions.

e. Other renewable generation strategies to consider

- **Share excess generation** – Whenever possible, excess generation should be utilized on-site through energy storage, with other buildings on campus, or through utility agreements with other buildings in portfolio.
- **Install energy storage** – Utilize on-site energy storage (batteries, thermal, etc.) to shift energy use for peak load reduction, limit over-generation sent back to the grid, reduce demand charges, reduce energy costs by taking advantage of time-of-use (TOU) rates, and provide cloud cover and outage protection for the facility.
- **PV array orientation –** To the extent possible, orient the PV arrays in way that maximizes alignment of the onsite generation with the onsite electrical load. This approach should be reviewed and adjusted over time to provide alignment with the needs of the utility grid.

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ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS **1815.31**
(New 10/2017 - Continued)

Renewable Energy Generation (Continued)

- **Use over-generated energy for EVSE charging** – Electric vehicle service equipment (EVSE) can utilize excess energy generated to charge electric vehicles. This will help reduce or avoid export of over-generated electricity, and help agencies meet zero-emission vehicle charging infrastructure goals. Energy used for electric vehicle charging does not count toward building energy use, nor does it need to be included in ZNE building calculations. However, electricity generated through on-site renewables that is used for EV charging can be used in ZNE calculations to offset non-EV-charging electricity and natural gas use at the site.
- **Renewable heating and cooling** (including ground source heat pumps or district heating), electrification, and other technologies to improve efficiency.
- **Mixed source of renewable energy** – Consider mixed sources of renewable energy from multiple sources, to mirror best grid optimization. For example, wind power also generates without sunlight, and during non-daylight hours.
- **Renewable heating and cooling** (including ground source heat pumps or district heating), electrification, and other technologies to improve efficiency.

Additional Energy Reference Policies

State departments should have implemented the practices incorporated into the State Administrative Manual (SAM) Chapter 1800, *Sustainable Operations and Practices,* in the operation and maintenance of their facilities. Chapters that contain energy policies include:

- Standard Operating Procedures for Energy Management in State Buildings (Section 1805)
- Procedures for Energy Management in State Buildings During Electrical Emergencies (Section 1810)
- Energy Use Reduction for New, Existing and Leased Buildings (Section 1815)
- Energy Efficiency in Data Centers and Server Rooms (Section 1820)

State of California Zero Net Energy Resources and Guides

State of California Energy Efficiency Targets for Existing State Buildings Pursuing Zero Net Energy (ZNE)

(Continued)

ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS 1815.31
(New 10/2017 - Continued)

State of California Zero Net Energy Resources and Guides (continued)

- Source EUI targets – Table identifying energy efficiency (Energy Use Intensity) targets for existing state buildings to achieve or exceed when pursuing ZNE. Targets use Source EUI metrics that can be retrieved from Energy Star Portfolio Manager in a report, or calculated using ZNE Calculator.
- ZNE Calculator – Spreadsheet calculator developed by California Department of General Services to calculate Source EUI, estimate renewable energy generation and/or photovoltaic array requirements, and to verify achievement of ZNE after 12 months of energy data is verified.
- ZNE Decision Making Matrix for State Agencies – Guideline for what decisions need to be made by owners, tenants, etc., for state ZNE buildings.

Information and Directories:
- Getting to Zero Database – Database of verified and emerging ZNE buildings. Agencies are encouraged to submit information on their buildings that have been built or upgraded to be ZNE, as well as after 12 months of energy data have verified achievement.

Guidelines and Resources:
- New Buildings Institute Zero Net Energy Hub – Website with resources and tools supporting ZNE, energy efficiency and other related efforts.
- The Technical Feasibility of Zero Net Energy Buildings in California – A ZNE technical report by ARUP for PG&E published December 2012.
- The Road to ZNE: Mapping Pathways to ZNE Buildings in California – A ZNE report by HMG for California Utilities, published December 2012.
- Net Zero Energy Design: A Guide for Commercial Architecture, Thomas Hootman, 2012
- Design Professional's Guide to Zero Net Energy Buildings, Charles Eley, 2016
- How-To Guide for Energy-Performance-Based Procurement: An Integrated Approach for Whole Building High Performance Specifications in Commercial Buildings – NREL, 2013
- Introduction to Cost Control Strategies for Zero Energy Buildings: High-Performance Design and Construction on a Budget – NREL, 2014
- Cost Control Strategies for Zero Energy Buildings: High-Performance Design and Construction on a Budget – NREL, 2014
- *An Energy-Performance-Based Design-Build Process: Strategies for Procuring High-Performance Buildings on Typical Construction Budgets: Preprint – NREL, 2014*

Case Studies:
- Zero Net Energy Case Study Buildings Volume 1 – Six case studies of ZNE buildings published in September 2014, written by Edward Dean for PG&E
- Zero Net Energy Case Study Buildings Volume 2 – Five case studies of ZNE buildings published April 2016, written by Edward Dean for PG&E
- Zero-Net Energy Case Studies – New Buildings Institute, 2014. Brief case studies of various ZNE buildings in US. More NBI case studies at this link.

REPORTING REQUIREMENTS **1815.4**
(New 5/2015)

4. Reporting Requirement

Each state agency shall be responsible for developing annual energy use reduction goals and intended actions for achieving the goals stated in its five-year infrastructure plan.

a. Agency Reporting Requirements for State-Owned (Existing) Buildings and New and Renegotiated State Building Leases.

The annual energy use reduction goals of existing buildings, as well as new and renegotiated state building leases, shall be included in the annual state agency five-year infrastructure plan, and annual whole building energy use shall be entered into the ENERGY STAR Portfolio Manager database, with access provided to DGS.

Benchmarking of initially occupied new buildings and build-to-suit leases should begin upon building occupancy.

RESOURCES **1815.5**
(New 5/2015)

Alternative funding sources to support agency five-year infrastructure plans to meet or exceed the requirements of this management memo can include power purchase agreements (PPA's), GS $Mart, the *Energy Efficient State Property Revolving Fund*, or other funding mechanisms.

Title 24, Part 6, Energy Efficiency Standards http://www.energy.ca.gov/title24/

Design Guidelines to Consider

- Energy Design Resources, Investor-Owned Utilities
  PG&E, SDG&E, SCE, SMUD, and LADWP

- Savings by Design Program
  Savings by Design Online Program Handbook

- Saving Energy in Commercial Buildings, NREL , U.S. Department of Energy

- Energy Star Building Upgrade Manual, U.S. Environmental Protection Agency

- National Institute of Building Sciences Whole Building Design Guide

- California Commissioning Guides for New Buildings and Existing Buildings

- Leadership in Energy and Environmental Design (LEED) Resources, US Green Building Council

- Database of State Incentives for Renewables & Efficiency

ENERGY EFFICIENCY IN DATA CENTERS AND SERVER ROOMS 1820

(New 11/2014)

The intent of this section is to provide direction to all state agencies under the Governor's executive authority to meet data center and server room energy efficiencies as required in the Green Building Action Plan Section 10.7.

POLICY 1820.1

(New 11/2014)

State agencies will achieve energy operating efficiency in data centers and server rooms in state owned and state leased buildings.

AUTHORITY 1820.2

(New 11/2014)

Executive Order B-18-12 mandates that DGS work with other state agencies to develop and implement policies and procedures for the operation and maintenance of state buildings to achieve operating efficiency improvements and water and resource conservation, and to continually update and incorporate these into the State Administrative Manual (SAM); pursuant to the Green Building Action Plan section 10.7.

REQUIREMENTS OF DATA CENTERS AND SERVER ROOMS 1820.3

(New 11/2014)

1. By December 31, 2014, all state-owned and leased data centers and server rooms greater than 200 square feet shall be operated within the 2011 ASHRAE - TC 9.9, Class A1 – A4, recommended guidelines for temperature and humidity in addition to all applicable 2013 Title 24 Building Energy Efficiency Standards. In most cases it will not be necessary to control humidity and/or dew point in order to stay within the specified ASHRAE- recommended guidelines. If this becomes a problem, the Department of Technology can assist agencies by recommending solutions.

   Temperature and humidity in data centers and server rooms shall be measured at the information technology (IT) equipment air inlets for temperature and humidity compliance. It is recommended that supply air inlet temperatures in data centers remain in the 23 to 27 degree Celsius (C) (73 to 81 degrees Fahrenheit) range.

Class	Equipment Environmental Specifications	
	Product Operations	
	Dry-Bulb Temperature (˚C)	Humidity Range, Non-condensing
A1 to A4	18 to 27	5.5ºC Dew Point to 60% Relative Humidity and 15ºC Dew Point

2. All state data centers that exceed 1,000 square feet shall measure and report their power usage effectiveness (PUE) annually by December 31 (beginning December 31, 2014) to the Department of Technology using the Power Usage Effectiveness Report (TECH 408). For agencies whose cooling is supplied through the downtown Sacramento Central Plant, the Department of Technology can provide specific instructions for the calculations. Agencies are responsible for submitting these reports, and must base their PUE calculations on the criteria outlined in the Green Grid publication.

   Data centers that exceed a PUE of 1.5 shall reduce their PUE by a minimum of 10 percent per year until they achieve a 1.5 or lower PUE. These reductions can be achieved through energy saving measures and/or through scheduled and budgeted power and cooling supply equipment replacements. If agencies that manage data centers 1,000 square feet or larger do not have the expertise to reduce PUE, the Department of Technology can provide suggestions. The Department of General Services and local utilities also are excellent resources to suggest energy savings measures.

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REQUIREMENTS OF DATA CENTERS AND SERVER ROOMS **1820.3** (Cont. 1)

(New 11/2014)

3. When purchasing network switches and routers, all state agencies must specify the Energy Efficient Ethernet IEEE (Institute of Electrical and Electronics Engineers) 802.3-2012 Section 6 standard to the maximum extent possible. (Download a free copy of this IEEE standard from (the IEEE Standards Association).

4. All state agencies must consider virtualization (options when refreshing equipment or standing up new systems. Virtualization is the creation of a virtual rather than actual version of something such as an operating system a server a storage device or network resources. Use of the most energy efficient power supplies available should be included in the purchase of new IT equipment.

RESOURCES **1820.4**

(New 11/2014)

1. Power Usage Effectiveness Report http://www.cio.ca.gov/pdf/PUE-Reporting-Report.pdf

2. Institute of Electrical and Electronics Engineers (IEEE) Standards http://standards.ieee.org/about/get/802/802.3.html

STATE BUILDINGS AND GROUNDS MAINTENANCE AND OPERATION 1821

(New 10/2015)

SAM section 1821 provides state building and facility managers with practices and procedures that will help them achieve operational efficiencies and resource conservation measures for:

1. Integrated Pest Management (IPM)
2. Drought Moratorium
3. Landscaping Practices
4. Maintenance of Building Exteriors, Roofs, Hardscape, and Exterior Painting

State departments should have implemented the practices incorporated into SAM Chapter 1800, Sustainable Operations and Practices, in the operation and maintenance of their facilities. See the following SAM sections for more information:

- Water Conservation (Section 1835)
- Indoor Environmental Quality (Section 1825)
- Recycling And Waste Diversion (Section 1840)
- Environmentally Preferable Purchasing (EPP) (Section 1845)
- Cleaning Products And Methods (Section 1825.4)

POLICY 1821.1

(New 10/2015)

State department building and facility managers will implement practices and procedures that assist them in meeting the increased efficiency and resource conservation goals described in EO B-18-12.

In addition to the ENERGY STAR Portfolio Manager database reporting requirements for water and energy use, departments should be prepared to provide status on compliance with these policies in the *Road Map to Achieving Executive Order B-18-12 and B-16-12*.

DEFINITIONS **1821.2**
(New 10/2015)

Definitions:
For SAM section 1821, *buildings and grounds maintenance* refers to the routine cleaning and the day-to-day maintenance of a building's interior and exterior and the surrounding landscape and hardscape that are considered a part of that facility.

Buildings and grounds maintenance can include repairs of a minor and simple nature involving mechanical and electrical systems and building elements that can readily be performed by maintenance personnel or technicians.

Exclusions:
It does not include the following: (see Green California Glossary for definitions)

- Remodeling
- Rehabilitation
- Renovation
- Restoration
- Additions, or
- Any other type of work normally performed by a construction contractor or personnel with specialized certification.

INTEGRATED PEST MANAGEMENT **1821.3**
(New 10/2015)

On-site staff and contracted pest management companies shall follow an Integrated Pest Management (IPM) strategy that focuses on long-term prevention or suppression of pest problems through a combination of techniques that may include:

- Monitoring for pest presence and establishing treatment threshold levels;
- Using non-chemical practices to make the habitat less conducive to pest development;
- Improving sanitation; and
- Employing mechanical and physical controls.

The Department of General Services (DGS) Best Practices Manual, Chapter 3 provides detailed steps on implementing an IPM plan. Topics include:

A. Objectives and Strategies: IPM Best Practices (pg. 3-3)
B. Lead Person: Assign pest management lead person for each building site (pg. 3-5)
C. Monitoring and Evaluation: Monitor, keep records, and evaluate IPM program activities (pg. 3-7,3-12)
D. Green IPM Practices: Emphasize use of cultural, nonchemical and biological controls in all IPM activities (pg. 3-8)
E. Communication: Notify building occupants before pesticide application (3-11)
F. IPM Design: Design landscape to minimize pest problems and install mowing strips and underlayments to reduce herbicide use (pg. 3-29, 3-30, 3-32)
G. Lighting: Install outdoor lighting that doesn't attract flying insects (pg. 3-31)
H. Waste: Store garbage receptacles on concrete or asphalt surfaces, away from building entrance; keep sealed after loading; empty regularly (pg. 3-31, 3-35)
I. Proactive Maintenance: Make building repairs that exclude pests (e.g., install door sweeps, automatic door closers), and reduce water sources, food, and harborage (e.g., seal cracks and crevices, fix HVAC and plumbing leaks) (pgs. 3-28, 3-34, 3-38)
J. Eliminate Food Sources: Keep food storage areas clean and dry (pg. 3-36)

When establishing a pest treatment plan, appropriately licensed personnel shall use non-chemical and biological controls. If this treatment is ineffective, use Tier 3 (least hazardous) herbicides/insecticides, progressing to Tier 2 and then to Tier 1 (most hazardous) only if necessary to manage the pests. Utilize only Tier-rated herbicides/insecticides as listed on the current San Francisco Department of Environment Hazard Screening List.

DROUGHT MORATORIUM 1821.4

(Revised 09/2016)

The Emergency Drought Proclamation dated January 17, 2014, places a moratorium on new, non-essential landscaping projects at state facilities and on state highways and roads. Projects that are not needed to protect existing trees and shrubs, or are not necessary for erosion or dust control are considered non-essential. Any exemptions must be approved by the governor's office. Submit any exemption requests to sustainability@dgs.ca.gov.

LANDSCAPING PRACTICES **1821.5**
(New 10/2015)

State building and facility managers will adopt the following landscaping practices:

- Reduce landfill waste material and water use;
- Promote the purchase of sustainable plant and maintenance materials; and
- Maintain a healthier outdoor environment.

These practices apply to all grounds and building exterior maintenance and landscape projects occurring on site* and will be followed by on-site staff participating contractors and vendors. They include:

A. Existing Landscapes: Should be maintained to survive the drought with reclaimed water whenever possible. Protect high priority landscape elements such as existing trees, ground covers and shrubs. Protect all slopes from erosion. Convert conventional spray heads or rotors to drip and/or low precipitation rate nozzles. A minimum three inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications.

B. Existing Lawns: During a declared drought, low priority landscapes such as lawns without trees shall be watered only to the extent to a minimum to control dust and erosion. The University of California, Davis publication, Managing Turfgrasses during Drought, provides useful information on warm-season and cool-season grasses in California. Trees in lawn areas that provide shade to buildings and hardscapes are high priority. Add drip irrigation around the drip line of the tree or water slowly and deeply with a trickling hose to increase survival rate. Trees can develop Phytophthora root rot if soil around their base remains wet for long periods. To prevent excessive growth, do not fertilize lawns. Follow the US Composting Council guidelines when using compost to retain moisture on existing lawns.

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** Refer to latest version of the California Department of Water Resource's model water efficiency landscape ordinance, section 490.1(e) for exceptions.*

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LANDSCAPING PRACTICES **1821.5** (Cont. 1)
(New 10/2015)

C. Low Water Use Landscape: All new and rehabilitation landscape projects shall comply with the latest version of the California Department of Water Resource's model water efficiency landscape ordinance (MWELO, 2015 Revision).

D. Irrigation: Installation of irrigation sub-meters, flow meters, master valves and smart irrigation controllers are recommended. Overhead irrigation shall be scheduled between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from the local water purveyor, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance. Observe irrigation cycles and if water is running off, adjust irrigation timers to run for less time, but more frequently (as allowed). Establish a water budget for the landscape based on the plants, landscape area and local climate, and schedule irrigation based on the weather, soil type and to meet the water budget. (Click here for cycle and soak methods.)

E. Sustainable Grounds and Landscape Maintenance Practices*:* Sustainable landscaping practices produce significant economic and environmental benefits. Savings include reduced labor, water and fertilizer cost, lower hauling expenses and disposal fees. Standard landscaping practices include grass- cycling, lawn aeration, mulching, and composting practices that enhance the soil. These practices increase the water-holding capacity of soil, reduce erosion, and conserve water. Where appropriate, choose plants that are native or of low water use and are non-invasive to the area; consider mature plant size as it relates to available planting space to reduce pruning needs.

F. Erosion, Sedimentation Control and Storm Water Retention*:* Follow recommendations for prevention of erosion, storm water pollution and reducing peak runoff found in 5.106.1 Storm Water Pollution Prevention (p.31), 5.106.10 Grading and Paving (p.34) in the 2013 California Green Building Standards Code (or current edition). Where possible, incorporate A5.106.2 Storm Water Design (page 100) and A5.106.3 Low Impact Development (LID)(page100).

MAINTENANCE OF BUILDING EXTERIORS, ROOFS, HARDSCAPE AND EXTERIOR PAINTING 1821.6

(New 10/2015)

To reduce the harmful effects of chemicals and air pollution on the local environment and to promote water and energy conservation during exterior maintenance activities, departments are required to develop a maintenance program consistent with the guidelines outlined in Sustainable Site Credit 2: Building Exterior and Hardscape Management Plan of LEED 2009 for Existing Buildings Operations and Maintenance. Use this link for more comprehensive details:
http://www.usgbc.org/Docs/Archive/General/Docs5545.pdf

A. Chemicals: The use of harsh chemicals is not usually necessary for most building exterior maintenance activities. The strength of the cleaning solutions should approximate the level sufficient to obtain satisfactory results. Do not use cleaning solutions stronger than necessary for the particular task. Cleaning solutions for exterior maintenance should be Green Seal certified or equivalent and should conform to Environmentally Preferable Purchasing (EPP) guidelines as stated in SAM 1850.

B. Exterior Maintenance*:* Sweeping is the preferred method of exterior cleaning; blowing is allowed when sweeping or raking is not practical. Departments are to adopt building exterior maintenance programs that conserve water. These programs include using manual cleaning methods over those that require high volume water spraying equipment. Water use, while sometimes necessary to carry out certain cleaning activities, should be carefully monitored to avoid excessive waste and runoff. If pressurized washing equipment is necessary, use equipment at the lowest output settings necessary to achieve satisfactory results. When power washing equipment is needed, use electric powered or battery-powered equipment to reduce air and noise pollution. Gasoline powered equipment should only be used in unusual or compelling circumstances and only with the authorization of the building maintenance supervisor.

C. Hardscape: Water should never be used for general sweeping of hardscape although pressurized water use for purposes of specific removal of stains or grime from pavement, or for hygienic reasons, is considered reasonable use. State facility childcare centers with playgrounds and patios where food can be consumed should also be hygienically and routinely maintained. The monitored use of pressurized water would be appropriate for these areas as well.

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MAINTENANCE OF BUILDING EXTERIORS, ROOFS, HARDSCAPE AND EXTERIOR PAINTING **1821.6** (Cont. 1)
(New 10/2015)

D. Roofing Cleaning*:* Roofs should be maintained on a periodic basis consistent with the roof type (built-up, single-ply, metal, cool roof, etc.); manufacturers' warranty requirements; location environment (coastal, urban, desert, mountain, etc.); and other external factors that affect roof performance, reflectivity and longevity. Department maintenance programs should establish roof cleaning methods and frequencies specific to the needs of each building roof to avoid unnecessary cleaning and overuse of water and cleaning solvents. Simple hand removal of debris from roofs, drains, gutters, downspouts, and overflows is often sufficient. Unwarranted frequent cleaning with powered equipment can reduce the lifespan of the roof by wearing down protective coatings and roofing materials. When powered roof cleaning equipment is necessary, equipment with a water recovery/recycle system should be considered in the maintenance program for the appropriate roof type. Refer to local municipalities for additional requirements.

E. Exterior Painting: Building maintenance often requires the repainting of exterior walls. Paints should either be no or low volatile organic compound (VOC) or contain recycled content when obtainable, meeting industry performance standards (see Green Seal GS-43 Standard). Use water-based paints over those containing oils. When spray equipment is used, ensure that care is exercised to prevent overspray and runoff, particularly near people, vegetation, waterways, and storm drains.

F. Training*:* Departments are responsible for providing training and instruction to maintenance personnel and contractors on the proper use, handling, and disposal of all solvents and paint products. Personnel should be directed to use manual methods of cleaning and painting whenever possible and to avoid the risk of excessive discharge with powered equipment.

RESOURCES **1821.7**
(Revised 09/2016)

Information and Directories:

- CalRecycle Compost and Mulch:
  Starting point to learn about the uses and benefits of compost and mulch.
- CalRecycle Compost and Mulch Producers:
  A list of permitted compost and mulch producers, searchable by county.
- Seal of Testing Assurance:
  Program run by U.S. Composting Council to assure high-quality finished products, includes listing of approved composters and laboratories.

Guidelines and Resources:

- State Landscaping and Irrigation Guidelines
- Bay-Friendly Landscape Guidelines:
  Provides a whole systems approach to the design, construction, and maintenance of landscapes to support the integrity of the Sacramento River and San Francisco Bay watersheds, but applicable elsewhere as well.
- Caltrans Compost Specifications:
  Guidelines for purchase and use of compost along California roadways, developed by California Department of Transportation (Caltrans). Other resources on erosion control, infiltration and plant establishment.
- Compost Use for Landscape and Environmental Enhancement Manual:
  CalRecycle manual with information on compost use in landscape plantings and environmental applications.
- Grasscycling:
  The natural recycling of grass by leaving clippings on the lawn when mowing.
- Xeriscaping:
  Developing landscapes specifically designed to use little or no water.
- Landscape Plants for California Gardens, Robert C. Perry 2010.
- California Invasive Plant Council (Cal-IPC): *List of invasive plants.*
- *Essential Landscaping Guidelines for State of California-owned Facilities and Application for Exemption from Drought Landscaping Moratorium*

INDOOR ENVIRONMENTAL QUALITY: NEW, RENOVATED AND EXISTING BUILDINGS 1825

(New 8/2014)

The intent of this section is to announce policy and provide direction to state agencies that build, lease and operate state buildings, on reducing indoor pollutant levels and ensuring healthful indoor environments for occupants in new, renovated, leased, and existing state buildings, as directed in Executive Order B-18-12.

POLICY **1825.1**
(Revised 8/2015)

State agencies that build, lease and operate state buildings shall implement measures to ensure a healthful indoor environment for their building occupants. State agencies shall implement as follows:

New/Renovated State Buildings: State agencies shall implement mandatory measures and relevant and feasible voluntary measures of the *California Green Building Standards Code (CALGreen)*, Part 11, related to indoor environmental quality (IEQ) that are in effect at the time of new construction or alteration. The information is available at http://www.bsc.ca.gov/home/calgreen.aspx.

Existing State Buildings: When accomplishing Alterations, Modifications, and Maintenance Repairs and when relevant and feasible, state agencies shall implement the mandatory and voluntary measures of the *California Green Building Standards Code (CALGreen)*, Part 11, related to indoor environmental quality.

New and Renegotiated State Leased Buildings:
The Department of General Services (DGS) will encourage Lessors to implement measures of the *California Green Building Standards Code (CALGreen)* related to indoor environmental quality, where economically feasible, for all new or renegotiated leases.

For the comprehensive policy see Management Memo 14-05: Indoor Environmental Quality: New, Renovated, And Existing Buildings.

AUTHORITY **1825.2**
(New 8/2014)

Executive Order B-18-12 mandates that state agencies implement relevant and feasible voluntary measures from Divisions A4.5 and A5.5 of the California Green Building Standards Code, to ensure healthy indoor environments for occupants.

DEFINITIONS **1825.3**
(New 8/2014)

For the purposes of SAM Section 1825 – 1825.5, the following definitions are used:

- ***Alterations*** - Any construction or renovation to an existing structure, other than repair, for the purpose of maintenance or addition.
- ***Modifications and Maintenance Repairs*** - Making alterations to an existing structure such that it will be better suited to current needs. This type of work may involve changing the use of interior space by repositioning walls, replacing fixtures, or other such modifications under the $200,000 threshold triggering *CALGreen* compliance.

ENSURING A HEALTHY INDOOR ENVIRONMENT **1825.4**
(New 8/2014)

There are major steps agencies can take to ensure a healthful indoor environment:

1. Use indoor products and materials that emit little or no harmful chemicals;
2. Provide appropriate ventilation, filtration and proper Heating, Ventilating, and Air Conditioning (HVAC) equipment maintenance;
3. Prevent water intrusion and the growth of mold;
4. Implement line of sight and "daylighting" for new buildings; and
5. Solicit feedback from tenants every two years.

Resources for implementing these steps are provided below:

Step 1: Use Indoor Products and Materials That Emit Little or No Harmful Chemicals

a) Building Materials
   i. Use adhesives, sealants, caulks, paints, coatings, and aerosol paints and coatings that meet the volatile organic chemical (VOC) content limits specified in *CALGreen* (Sections 4.504.2.1 through 4.504.2.4, and 5.504.4.1 through 5.504.4.3.1).
   ii. Use carpet systems, carpet cushions, composite wood products, resilient (e.g., vinyl) flooring systems, and thermal insulation, acoustical ceilings and wall panels that meet the VOC emission limits specified in *CALGreen* (Sections 4.504.3 through 4.504.5, 5.504.4.4 through 5.504.4.6, A4.504.1 through A4.504.3, and A5.504.4.5.1 through A5.504.4.9.1).

b) Furnishings and Seating
   Use office furniture and seating that complies with either:
   i. The DGS' Purchasing Standard and Specifications (*Technical Environmental Bid Specification 1-09-71-52,* Section 4.7) or
   ii. The American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) *Standard 189.1-2011* (Section 8.4.2.5).
   iii. CALPIA manufacturing and associated products are compliant with the DGS' Purchasing Standard and Specifications (*Technical Environmental Bid Specification 1-09-71-52.*

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ENSURING A HEALTHY INDOOR ENVIRONMENT **1825.4** (Cont. 1)

(New 8/2014)

c) Cleaning Products:
Use cleaning products that are low emitting and meet Green Seal (GS) Standard GS-37, *Cleaning Products for Industrial and Institutional Use*. CALPIA offers GS certified cleaning products at: http://catalog.pia.ca.gov

For relevant building types/uses, consider:
-GS-53, *Specialty Cleaning Products for Industrial/Institutional Use*
-GS-8, *Cleaning Products for Household Use*, and
-GS-52, *Specialty Cleaning Products for Household Use*

All GS standards can be found at:
http://www.greenseal.org/GreenBusiness/Standards.aspx

d) Cleaning Procedures:
i. Specify, use and properly maintain effective vacuum cleaners that meet the Carpet and Rug Institute's TM 113 – 110901*, Laboratory Test Procedure for Quantifying Respirable Particulate From Vacuuming Carpet*. Information can be found at: http://www.carpet-rug.org/documents/technical_bulletins/test_method_113.pdf
ii. Maintain entryways as specified in *CALGreen* (Section A5.504.5.1).
iii. Use non-chemical cleaning methods where feasible. Minimize the use of chemicals when cleaning floor surfaces.
iv. Follow the cleaning procedures of GS-42*, Commercial and Institutional Cleaning Services.*
v. Follow the Carpet and Rug Institute's *Carpet Maintenance Guidelines for Commercial Applications*. See: http://www.carpet-rug.org/Carpet-for-Business/Cleaning-and-Maintenance.aspx

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ENSURING A HEALTHY INDOOR ENVIRONMENT **1825.4** (Cont. 2)

(New 8/2014)

Step 2: Provide Appropriate Ventilation, Filtration, and HVAC Equipment Maintenance.

a) Existing Buildings – Maintenance and Operation

i. Operate HVAC systems continuously during work hours and provide no less than the required minimum outdoor air requirements in effect when the building permit was issued, or if no building permit was issued, when the building was designed, constructed or renovated. Please refer to Cal- OSHA's Title 8 regulations, Section §5142: Mechanically Driven Heating, Ventilating and Air-Conditioning (HVAC) Systems to Provide Minimum Building Ventilation, at http://www.dir.ca.gov/title8/5142.html

ii. Inspect HVAC systems at least annually; all HVAC inspections and maintenance shall be documented in writing (as required by Title 8, Section 5142). Annual inspections shall also include:

- Verification of minimum outdoor airflows using properly calibrated hand-held airflow measuring instruments.
- Confirmation that air filters are clean and replaced according to the manufacturer's specified interval or more frequently as needed based on specific local or seasonal conditions. Use high Minimum Efficiency Reporting Value (MERV) filters as specified below.
- Verify that outdoor dampers, actuators, and associated linkages operate properly.
- Check the condition of all accessible heat exchanger surfaces for fouling and microbial growth, and take action as needed.
- Check condensate drain pans for proper drainage and possible microbial growth, and take action as needed to correct and to prevent future drain blockages and microbial growth.
- To the extent accessible, inspect the first 20 feet of all lined ductwork downstream of cooling coils for visible microbial growth. If microbial growth is found, correct and take action to prevent future growth.
- Ensure that cooling towers are properly maintained and records of chemical treatment of cooling tower water are kept. Cooling tower plume discharges closer than 25 feet to any building intake shall be retrofitted where possible to meet the 25 foot requirement.
- Building managers shall develop a comprehensive HVAC preventative maintenance program.

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ENSURING A HEALTHY INDOOR ENVIRONMENT **1825.4** (Cont. 3)
(New 8/2014)

iii. Where feasible, use filters with a MERV rating of no less than 11, as specified in Section A5.504.5.3.1 of *CALGreen.* Existing HVAC systems incapable of accommodating increased pressure drops associated with the 11 MERV rating shall use the highest MERV rating that their fan(s) can accommodate while providing the design airflows. To the extent possible, all fan change-outs shall be sized to accommodate MERV 13 filters.

iv. Provide ongoing factory training for stationary engineers on proper operation and maintenance of all new and existing equipment, as well as all building management systems.

v. Initiate a computer-based preventive maintenance program for all HVAC equipment (see DGS' California Best Practices Manual, Section 2.3.5 for a description of the computerized maintenance management system).

vi. Provide specialized air treatment for buildings in areas where air quality standards are routinely exceeded. Consider using:

- Particulate matter air filters with a minimum MERV rating of 13 or higher (if feasible) for buildings in areas where the Environmental Protection Agency (US EPA) standards for PM10 (particulate matter) or PM2.5 are routinely exceeded.
- Ozone-removing air cleaning deviceswith a minimum volumetric ozone removal efficiency of 40 percent in areas where the US EPA 8- hour average ambient ozone standard is routinely exceeded. These devices should be operated continuously during times that the relevant air quality standard is exceeded and the building is occupied. See http://www.arb.ca.gov/adam/index.html or contact your local air quality management district to determine whether a specific site falls into this category.

vii. Purge buildings prior to daily occupancy with outdoor air, with either the minimum ventilation rate for one hour, or three complete air changes as required for non-residential buildings (Section 120.1(c)2 of the 2013 *California Code of Regulations*, Title 24, Part 6.)

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ENSURING A HEALTHY INDOOR ENVIRONMENT **1825.4** (Cont. 4)

(New 8/2014)

b) New and Renovated Buildings

i. Commission new buildings to ensure proper installation and operation of all building systems, including the proper delivery of the required amount of outdoor air (Title 24, Part 6, Section 120.8).

ii. Implement relevant *mandatory* measures and relevant and feasible *voluntary* measures from *CALGreen* (Division 5.5 and Appendix section A5.5).

iii. Provide specialized air treatment for buildings in areas where air quality standards are routinely exceeded.

- Use particulate matter air filters with a minimum MERV rating of 13. MERV 16 or HEPA (high efficiency particulate arrestance) filters should be considered where feasible for institutional residential buildings that house sensitive groups such as the elderly or infirm, and buildings used by children.
- Consider using ozone-removing air cleaning devices with a minimum volumetric ozone removal efficiency of 40 percent in areas where the US EPA 8-hour average ambient ozone standard is routinely exceeded. These devices should be operated continuously during times that the relevant air quality standard is exceeded and the building is occupied. See http://www.arb.ca.gov/adam/index.html to determine whether a specific site falls into this category.

iv. Specify that all HVAC systems above 2,000 cubic feet per minute (cfm) be equipped with outdoor airflow measuring stations and be connected to a building energy management system. Building management systems shall be programmed to provide audible and visible alarms when minimum outdoor airflow rates are not met. If feasible, HVAC systems smaller than 2,000 cfm shall also be equipped with such airflow measuring stations.

v. Specify that all HVAC systems above 2,000 cubic feet per minute (cfm) be equipped with outdoor airflow measuring stations and be connected to a building energy management system. Building management systems shall be programmed to provide audible and visible alarms when minimum outdoor airflow rates are not met. If feasible, HVAC systems smaller than 2,000 cfm shall also be equipped with such airflow measuring stations.

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ENSURING A HEALTHY INDOOR ENVIRONMENT **1825.4** (Cont. 5)
(New 8/2014)

vi. Develop an IEQ Construction Management Plan that incorporates measures in *CALGreen* Sections A5.504.1 through A5.504.2 for actions during and after construction to ensure healthful IEQ.

Step 3: Prevent Water Intrusion and Growth of Mold

Keep all buildings clean and sanitary as required by Title 8 Section 3362 http://www.dir.ca.gov/Title8/3362.html. When exterior water intrusion, leakage from interior water sources, or other uncontrolled accumulation of water occurs, the intrusion, leakage or accumulation shall be corrected, typically within 24-48 hours because these conditions may cause the growth of mold.

Step 4: Line of Sight and Daylighting – New Buildings

a) Toplighting and sidelighting are recommended per *CALGreen* (Section A5.507.2); recommended are the use of light shelves, reflective room surfaces, means to eliminate glare, photosensor controls and not using diffuse daylighting glazing where views are desired. See http://newbuildings.org/lighting and http://www.wbdg.org/resources/daylighting.php?r=dd_lightingdsgn for additional information.
b) Direct line of sight to the outdoor environment via vision glazing between 2.5 and 7.5 feet above the finished floor in 90 percent of all regularly occupied areas is required. *(CALGreen* Section A5.507.3).

Step 5: Input from Occupants – Existing Buildings

Input from building occupants should be solicited every two years to obtain feedback on any IEQ and/or comfort concerns. One of the following methods should be used:

a) Occupant surveys to collect information on IEQ, as well as on other sustainability issues, such as the need or desirability for electric vehicle charging stations, commute alternatives, etc.
b) Maintenance and regular review of an occupant complaint database documenting complaints related to IEQ and response to the complaints.

RESOURCES **1825.5**
(New 8/2014)

Guidelines and standards can help state agencies achieve acceptable IEQ, including but not limited to:

1. VOC emission limits for building materials established by CDPH (http://www.cal-iaq.org/separator/voc/standard-method);
2. Architectural coatings guidelines and composite wood rules from CARB (see CALGreen, http://www.arb.ca.gov/coatings/arch/docs.htm, and http://www.arb.ca.gov/toxics/compwood/compwood.htm;
3. Green Seal guidelines for cleaning products and processes http://www.greenseal.org/GreenBusiness/Standards
4. Ventilation, filtration, and daylighting regulations from the Energy Commission (see current building efficiency standards at http://www.energy.ca.gov/title24/
5. Cal-OSHA requirements (http://www.dir.ca.gov/title8/5142.html, http://www.dir.ca.gov/title8/3362.html, and others);
6. Measures included in criteria from green building organizations such as those in the US Green Building Council's Leadership in Energy & Environmental Design program (http://www.usgbc.org/leed/rating-systems);
7. ASHRAE (consensus) standards for ventilation and filtration: https://www.ashrae.org/
8. California Best Practices Manual: Better Building Management for a Better Tomorrow (http://www.green.ca.gov/GreenBuildings/BBBTManual.aspx);
9. California Buying Green Guide: Standards and Specifications for Environmentally Preferable Purchases (http://www.dgs.ca.gov/buyinggreen/Home/BuyersMain.aspx); and
10. Building Standards Commission Guidebooks (http://www.bsc.ca.gov/pubs/guides.aspx).

WATER EFFICIENCY AND CONSERVATION 1835

(New 8/2014)

The intent of this section is to provide direction to all state agencies under the Governor's executive authority on meeting the water use reduction requirements outlined in Executive Order B-18-12.

POLICY 1835.1

(Revised 8/2015)

State agencies shall reduce water use at their facilities 10 percent by 2015, and 20 percent by 2020 as measured against a 2010 (or earlier) baseline. State agencies shall enter complete annual water use data into the Energy Star Portfolio Manager, and provide access to the Department of General Services (DGS) by March 1 of each year.

For the comprehensive policy see Management Memo 14-02: Water Efficiency and Conservation.

AUTHORITY 1835.2

(New 8/2014)

Executive Order B-18-12 mandates that DGS work with other state agencies to develop and implement policies and procedures for the operation and maintenance of state buildings to achieve operating efficiency improvements and water and resource conservation, and to continually update and incorporate these into the State Administrative Manual (SAM).

Executive Order B-18-12 also requires state agencies to reduce overall water use at the facilities they operate by 10 percent by 2015 and by 20 percent by 2020, as measured against a 2010 baseline.

DEFINITIONS **1835.3**
(New 8/2014)

For the purposes of SAM Section 1835, the following definitions are used:

- ***Process Water*** – Water used for manufacturing processes, for testing and maintaining manufacturing equipment, and water used in combined heat and power facilities.

- ***GrayWater*** - Untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Includes wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

WATER USE REPORTING REQUIREMENTS 1835.4

(New 8/2014)

The following are water use reporting requirements for state agencies:

1. General Requirements

   By March 1 of each year, state agencies shall enter complete annual water use data for the preceding year into the Energy Star Portfolio Manager database. Agencies shall provide online access to this data upon completion to the Department of General Services, Office of Sustainability, and notify upon completion to sustainability@dgs.ca.gov.

   Agencies may exclude process water from the annual reporting and water use reduction requirements. Also excluded is water used for fish and wildlife habitat, livestock maintenance, and firefighting. Annual usage will be measured against the baseline data previously reported by each state agency to determine if water reduction targets are met.

2. Instructions for Leased Facilities

   New and renegotiated state leases shall include provisions for reporting water use where economically feasible. Agencies managing state-owned buildings are to report water usage. If agencies lease a building or space (state owned) managed by DGS, DGS will report the water use for that building space. If a state agency other than DGS manages the building or space, that agency will report the water use for that building.

3. Estimating Water Use at Facilities without Water Meters

   It is understood that not all state facilities can report actual water use, because metering or sub-metering is not available. This does not exempt these agencies/facilities from responsibility for active management of water consumption or reporting of water use. Baseline and ongoing water use can be estimated based on the water use ratings of fixtures and appliances at the site, the duration per use, amount of usage, and the number of occupants. Department of Water Resources Water Use Reduction Guidelines and Criteria document provides guidance on how to baseline water usage and report annual usage for facilities without meters. Agencies operating in these facilities should also apply Best Management Practices for Water Use, and document policies for purchasing/replacing water-using fixtures and/or equipment with higher efficiency models. If not cost prohibitive, state agencies should make water meter installations a priority so they can obtain accurate measurements of water use.

WATER USE REQUIREMENTS **1835.5**
(New 8/2014)

The following are requirements for water use for state agencies:

1. State agencies shall purchase, install and operate WaterSense or equivalent (labeled) industry standard fixtures and equipment (including irrigation equipment) whenever it is available, cost-effective, and meets quality requirements.

2. Landscape plants shall be selected based on their suitability to local climate and site conditions, and reduced water needs and maintenance requirements.

3. All new and renovated state buildings and landscapes shall utilize alternative sources of water wherever cost-effective. Sources may include, but are not limited to: recycled water, graywater, rainwater capture, storm water retention, and other water conservation measures.

4. State agencies should perform the following critical activities for water use reduction:

   a. Implement Best Management Practices (BMPs)

      BMPs are ongoing actions that establish and maintain water use efficiency. State agencies must implement the BMPs in the Water Use Reduction Guidelines and Criteria. State agencies are responsible to review and apply these BMPs to all facilities they occupy.

   b. Complete Building and Landscape Inventories

      State agencies should complete a Building and Landscape Inventory every five years. The quantitative inventory requires a facility walk- through to assess the types, numbers and condition of all water using fixtures, appliances and irrigation equipment.

   c. Implement a Landscape Water Budget Program

      Large landscape areas over 20,000 sq. ft. should be managed and water use tracked with a landscape water budget program. Large landscape water use often represents a significant percentage of a facility's water use, and significant water savings can often be achieved through better irrigation scheduling or inexpensive improvements in irrigation hardware. Landscape maintenance staff should attend an Environmental Protection Agency WaterSense-labeled training program to become proficient in landscape water budgeting and water management.

FACILITIES EXEMPT FROM WATER USE REDUCTION REQUIREMENTS 1835.6

(New 8/2014)

Buildings or facilities that meet or exceed 2010 or newer CalGreen water efficiency standards may be exempted from water use reduction requirements, since they already meet low water use targets. Supporting documents or data must be provided if requested and may include monthly/annual utility water use reports and/or water use calculation tables that document the water use ratings.

Agencies must still report the water use of these facilities in the Energy Star Portfolio Manager database on an annual basis, as outlined in section 1835.4.

RESOURCES 1835.7

(New 8/2014)

1. Department of Water Resources, Water Use and Efficiency Branch
2. SBX7-7
   Sustainable Sites Initiative
3. Greening Federal Facilities
   Graywater regulations
4. American Rainwater Catchment Association
5. Irrigation Association
6. Establishing Baselines and Meeting Water Conservation Goals of Executive Order 13423
7. Water Smart Guidebook; a Water-Use Efficiency Plan
8. California Landscape Contractors Association WMCP
   (Water Management Certification Program)
9. River Friendly Guidelines for Landscape Professionals
10. Green California
11. Water sense
12. CalGreen

RECYCLING AND WASTE DIVERSION PRACTICES **1840**
(New 8/2014)

Please refer to SAM Chapter 1900 – Waste Prevention and Recycling of Non-Hazardous Waste.

STATE AGENCY BUY RECYCLED CAMPAIGN (SABRC) **1845**
(New 8/2014)

Departments will consider Recycled Content Products (RCP) in conducting their purchasing activities. Please refer to State Contracting Manual (SCM) Vol. 2 and Vol. 3, Chapter 3 – Socioeconomic and Environmental Programs.

ENVIRONMENTALLY PREFERABLE PURCHASING **1850**
(New 8/2014)

Departments are required to purchase commodities that meet DGS Purchasing Standards. Please refer to State Contracting Manual (SCM) Vol. 2 and Vol. 3, Chapter 3 – Socioeconomic and Environmental Programs.