

MANAGEMENT MEMO

	NUMBER: MM 17-04
SUBJECT: ZERO NET ENERGY FOR NEW AND EXISTING STATE BUILDINGS	DATE ISSUED: OCTOBER 16, 2017 EXPIRES: UNTIL INCORPORATED INTO SAM OR ON OCTOBER 1, 2018
REFERENCES: Executive Order (EO) B-18-12; Green Building Action Plan, AB 32, MM 15-04, SAM chapter 1815.31	ISSUING AGENCY: DEPARTMENT OF GENERAL SERVICES

Purpose

This management memo (MM) 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 MM 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. See [State Administrative Manual \(SAM\) Section 1815.31](#) for more details and guidance.

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, and as many as possible already begun, 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-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 should

also provide status on compliance with this policy in their department *Sustainability Road Map*.

Definition of Zero Net Energy (ZNE)

Zero Net Energy means that a building or facility is energy efficient, meeting established energy efficiency targets, and consumes no more energy than it produces from clean, renewable resources over the course of a year. Renewable energy generation can occur onsite, and/or offsite, as outlined under “Renewable Energy Generation” below. In further defining ZNE for state buildings, the California’s governor’s office approved the ZNE Source definition for ZNE on state buildings to comply with Executive Order B-18-12 as follows:

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.*

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 reportingⁱ. 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 105-2014ⁱⁱ. 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.

Strategies for Achieving ZNE

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

- 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
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ⁱ 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.

ⁱⁱ ASHRAE Standard 105-2014, Table J2A. Primary Energy Conversion Factors for National Comparisons

EO B-18-12 and identified in its [Green Building Action Plan](#)). Energy efficiency strategies for new construction and major renovations pursuing ZNE are identified in the [SAM Section 1815.31](#).

- b. **Existing Buildings** – Existing state buildings should strive to achieve high levels of energy efficiency before adding renewable energy to achieve ZNE. Strategies and energy efficiency targets for existing buildings to work to achieve for ZNE are identified in the [SAM Section 1815.31](#) and in [Source EUI targets](#) for Existing State Buildings. 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.
2. **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. Additional strategies for renewable energy generation are included in the [SAM Section 1815.31](#). 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 practical.
 - b. **Campus** – Generate and use renewable energy within a multiple building campus to the extent possible.
 - c. **Portfolio** – Generate and use renewable energy within an owner’s portfolio to the extent possible.
 - d. **Community** – Generate renewable energy within the state for use at the facility, after other feasible options have been exhausted to the extent possible.
 - e. Consider other renewable energy generation strategies identified in *SAM Section 1815.31*

Energy Policies, Resources and Guides

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.

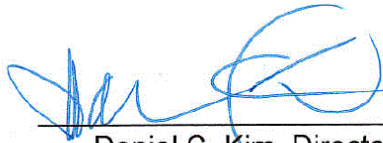
Additional State of California Zero Net Energy Resources and Guides are identified in [SAM Section 1815.31](#).

Contact

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Signature



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Date