

Energy Optimization Initiative for Real Estate

Effective July 1, 2019

I. Introduction

The purpose of the Energy Optimization (EO) Initiative is to enable the systematic identification, implementation, and tracking of economically attractive energy-related opportunities in the CalPERS real estate portfolio. The initiative further seeks to reduce carbon intensity, helping mitigate the systemic risk of climate change to the real estate portfolio, and more broadly to CalPERS' Total Fund, while enhancing returns and the long-term value of CalPERS investments through capturing energy cost savings and improving the attractiveness of the assets to tenants. Additionally, the initiative seeks to facilitate transitioning the CalPERS portfolio towards carbon neutrality where accretive to performance.

The initiative will apply to domestic separate account partnerships and other external managers where appropriate. Where the initiative does not apply, we encourage all of CalPERS Real Estate managers to pursue the spirit of the EO Initiative by looking for attractive opportunities to optimize the energy used by their real estate assets.

II. EO Initiative Requirements

A. EO Projects and Programs

Managers will submit new proposed EO Projects and Programs, as described below, annually through the Annual Investment Plan (AIP) process. We encourage managers to be diligent in finding opportunities to enhance the energy optimization of their real estate assets while considering return implications.

i. EO Projects

These are projects that have significant energy optimization potential and cost implications. Such projects may include, but are not limited to, purchasing renewable energy equipment, HVAC replacement, or lighting system upgrades. Renovations can present ideal opportunities to reduce buildings' energy load requirements and optimize the way in which that load is served.

- **Project-Level Return Guidance.** EO Projects should meet or exceed the targeted return requirements for the relevant investment strategy, adjusted for risk, and/or support business plan objectives.

Such projects should be submitted for review and approval during the AIP.

ii. **Operational and Behavioral EO Programs**

Managers shall institute EO Programs that are accretive to portfolio performance objectives and appropriate for the markets in which they invest. These programs should be tailored according to market, property type, and tenant needs. EO Programs might include trying new technologies or techniques and initiating operational or behavioral changes that optimize energy use (e.g., through tenant engagement). These Programs should encourage the adoption of innovative solutions and leading-edge technologies to keep the real estate portfolio ahead of EO market trends where economically feasible to do so.

B. Systematic Energy Audits

Managers shall conduct audits for each building at least every five years, or as otherwise agreed to by CalPERS, based on individual building characteristics and available data. The intent of the Energy Audits is to have a systematic approach in place that enables managers to be proactive in finding opportunities to improve the quality of our assets through energy optimization and mitigating the obsolescence risk of energy sources, systems, equipment, materials, and controls. Audits may be conducted by the manager or by a third-party consultant at the partner's discretion and as appropriate based on available resources and asset complexity. Audit scopes should reasonably reflect the property type and size. CalPERS expects the audit scope to include analysis and review of items, which may differ based on property and strategy characteristics, in categories such as:

- Energy sources
- Building systems and equipment
- Building materials, fixtures, and design
- Operations and controls

Specific items to consider during the audit process include opportunities for carbon neutrality and demand response. Appendix A provides more details on the expected audit scope.

C. Tracking and Reporting

Managers will be required to utilize the following standardized tracking systems identified by CalPERS to report energy data. This standardized reporting will enable CalPERS to aggregate data across managers and portfolios to facilitate tracking and analysis:

i. GRESB

GRESB is an important tool CalPERS utilizes to monitor activities and facilitate engagement around ESG risks and opportunities, including those related to energy and carbon footprint, across our real assets portfolio.

ii. Energy Star

In addition to GRESB reporting, managers shall use Energy Star to report energy usage for domestic portfolios. Energy Star is a free platform where managers input energy usage across their portfolio. CalPERS will be given access to this data to enable real-time access to and rollup of usage trends across the real estate portfolio.

iii. Annual Investment Plan Reporting

EO reporting items will be included in AIP submissions and will cover the prior calendar year. Manager's AIP submissions will provide annual insights to CalPERS on the real estate portfolio's key performance indicators (KPIs, see Section II.D) and their progress over time. In addition to KPIs, the below will be included in the AIP reporting package:

- **Energy Performance Targets & Tracking.** Managers will be required to set their own targets for asset-level or portfolio-level energy performance after a baseline has been set (normalized for weather and occupancy, using appropriate intensity factors, and adjusted for acquisitions and dispositions) and to track progress relative to the targets they set.
- **EO Project Reporting.** Managers shall report on performance where possible (i.e., energy consumption and reduction in kWh) and track returns on previously approved EO Projects implemented during the year compared to underwriting.
- **Financial Incentives Reporting.** Managers will be asked to annually confirm in their AIP reporting that they have made best efforts to review available EO incentives in relevant markets. Additionally, managers will be expected to report the dollar amount of energy incentives secured during the year.

D. Key Performance Indicators (KPIs)

Tracking and reporting KPIs will help CalPERS understand portfolio energy use intensity and related risks and opportunities. Please see Appendix B for a table outlining the KPIs to be reported.

III. EO Initiative Best Practices

The below are strongly encouraged by CalPERS where cost effective and appropriate for property type.

A. Formalized EO Teams

Have a dedicated EO team or individual, whether that be in-house staff or a consultant.

B. EO Training and Engagement

Offer EO training and engagement both internally with staff and throughout the portfolio for tenants, encouraging tenants' voluntary participation. This should be included as an element of asset-level business plans.

C. Green Tenant Improvement Practices

Develop guidance and best practices for tenant engagement on new construction projects and renovations to tenant space.

D. Green Lease Clauses

Execute green lease clauses on a best-efforts basis with new and renewal tenants. Green lease clauses may include energy consumption reporting, sub-metering, minimum energy standards, and cooperation in asset-level EO Programs where it makes economic sense.

Appendix

A. Example Audit Scope Detail

Below are sample items to consider during the audit process, organized by the categories outlined in Section II.B of the EO Initiative.

Energy Sources

- *Types of energy sources.* Evaluate the energy mix (i.e., natural gas, renewable energy, etc.) that is serving the building energy load. Assess risk of regulatory change, such as a price on carbon.
- *Carbon neutrality.* Analyze and consider the cost/opportunity of carbon neutrality for the property (including the potential for onsite renewable energy or sourcing of renewable energy power to meet energy load).

Building Systems and Equipment

- *Equipment with significant energy or cost implications.* Conduct life cycle cost analysis¹ and assess preventative maintenance needs (e.g., consider age of HVAC system components and their remaining useful life to determine if available incentives make an early HVAC system replacement beneficial).
- *HVAC systems and equipment.* Evaluate parameters in use to ensure efficient operation (including assessment of chillers, cooling towers, fans, pumps, etc.).
- *Domestic water heating system.* Consider type and efficiency.

Building Materials, Fixtures, and Design

- *Insulation.* Consider type utilized and its R-value.²
- *Windows.* Review materials and efficiency.
- *Existing lighting fixtures.* Evaluate incumbent fixtures relative to more efficient alternatives and identify retrofit opportunities.
- *Floor plans.* Note any changes in occupancy or density as it affects energy use.

¹ Consider the remaining useful life of high capex equipment; perform cost/benefit analyses for replacing prior to the end of useful life (capital planning).

² R-value is defined as the capacity of an insulating material to resist heat flow; the higher the R-value, the greater the insulating power.

Operations and Controls

- *Historical utility bills.* Benchmark building energy use (e.g., determine load factors and identify peak, shoulder, and off-peak demand).
- *Building operating hours and demand response.*³ Analyze weekday, weekend, and off-hours schedules and identify opportunities to adjust energy usage relative to actual tenant utilization needs. Evaluate opportunities for demand response at the asset level, with the potential to implement a portfolio-wide plan.
- *Building automation systems.* Review system type, note extent of control, evaluate existing programming schedule, and calibrate as necessary.
- *Lighting controls.* Evaluate potential for lighting to be controlled via occupancy sensors and/or lighting control systems. Calibrate controls already in place based on usage data.
- *HVAC schedule.* Evaluate accuracy of operating hours and, where possible, initiate off-hours HVAC only on-demand.

³ Demand response provides an opportunity for energy consumers to play a significant, and compensated, role in the operation of the electric grid by reducing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives.

B. KPI Reporting Table

Below is a table summarizing the KPIs to be reported annually during the AIP process as described in Section II.D of the EO Initiative. An excel template will be provided to managers for consistency in reporting.

KPI	MEASURE	NOTES
Size of Portfolio	Square feet	
Occupancy	Percent of occupied square feet	
Energy Data Coverage	Percent of square feet reported	Sub-metered vs direct metered coverage (each as a % of total square feet) ⁴
Total Energy Cost	USD	
Energy Costs	USD per square foot	
Energy Used	kWh	Known energy used and estimated energy used for balance of portfolio (manager can use own portfolio consumption as a proxy for estimate)
Energy Use Intensity	kWh per square foot	and/or per occupant
Energy Use Intensity Vs. Industry Average	kWh per square foot	(Or versus peer group) if available
Total Renewable Energy Used	kWh	
Total Renewable Energy Purchased	kWh	
Onsite Renewable Energy Production, Owned & Used	kWh	
Onsite Renewable Energy Production, Third-Party Operated	kWh	

⁴ Square feet percentages should sum to 100% using the following categories: Sub-metered, Direct metered, Other (with explanation)

KPI	MEASURE	NOTES
Greenhouse Gas Footprint	Tonnes CO2e	Known GHG footprint and estimated GHG footprint for balance of portfolio (manager can use own known GHG emissions as a proxy for estimate) ⁵
GHG Intensity	Tonnes CO2e per square foot	
EV Charging Station Coverage	Number of charging stations and as a % of total portfolio parking spaces	
Green Leases Signed	Square feet covered	Both the amount added during the year and the running total
Certification Coverage	Number of buildings certified and total NAV that represents	Example certifications: Energy Star, LEED, BOMA, BREEAM

⁵ This will be used to calculate the carbon footprint for the portfolio to satisfy CalPERS commitment to the Montreal Pledge. Managers should consider activities beyond energy use (e.g., landfill diversion) that contribute to the portfolio's GHG footprint. The GHG reporting follows the [Greenhouse Gas Protocol](#), a standard for carbon emissions accounting by businesses, and the EO KPI Reporting template requests data for Scope 1 and 2 as defined by the protocol. Scope 1: Direct GHG emissions. Direct GHG emissions occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment. Scope 2: Electricity indirect GHG emissions. Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.