DGS Sustainability Roadmap 2020-2021

Progress Report and Plan for Meeting the Governor's Sustainability Goals for California State Agencies

California Department of General Services

Gavin Newsom, Governor

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Department of General Services

Sustainability Road Map 2020-2021

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EXECUTIVE SUMMARY

DGS serves as the state of California's business manager, providing state agencies with services including procurement, acquisition, real estate management and design, transportation, professional printing, administrative hearings, and funding and oversight for school construction. Created in 1963, DGS has 4,000 employees within six divisions and multiple offices. DGS manages a portfolio of 72 state-owned buildings totaling 20.2 million square feet (sq. ft.) across the state (2021).

DGS led the development of Governor Brown's Executive Order (EO) B-18-12, and its Green Building Action Plan. Since then, recent executive orders such as B-55-18 and N-19-19 are placing a greater focus on achieving carbon neutrality and increasing infrastructure resiliency as we face the reality of climate change impacts. DGS provides important leadership and assistance to other state agencies in meeting important climate goals and demonstrating leadership in state buildings. Through its Office of Sustainability, and through the development of policies in the State Administrative Manual (SAM), DGS coordinates implementation of state sustainability initiatives; with close collaboration among all DGS divisions, state agencies and the governor's office creating a rigorous and coordinated approach to climate change mitigation and adaptation.

While much work remains and DGS must continue to closely focus on addressing climate change, there is also much to celebrate in the most recent progress. Some key accomplishments are summarized here:

Climate Change Adaptation

- ***Addressing Climate Change Impacts*** – DGS has identified facilities most vulnerable to climate change impacts and will work with teams responsible for new construction, repairs, and retrofits to incorporate measures to improve climate resilience, and is developing state policy to help state facilities improve resiliency from the following climate change impacts:
    - Power interruptions and public safety power shutoffs (PSPS)
    - Wildfires & Drought
    - Temperature change, especially extreme heat events
    - Urban heat islands
    - Sea level rise and flooding for coasts and riverine areas
    - Changes in precipitation, extreme precipitation, and flood risk

Zero-Emission Vehicles

- ***ZEV First Policy*** – Beginning in 2017, DGS prohibited state agency purchases of any sedans solely powered by internal combustion engines, with exemptions for certain public safety vehicles. In addition, starting January 1, 2020, departments were only able to purchase fleet vehicles from manufacturers that recognize

the authority of the California Air Resources Board (CARB) to set greenhouse gas and zero- emission vehicle (Z E V) standards. These bold, first-in-the-nation policies reflect California's firm commitment to achieving clean transportation targets critical to bending the curve on global greenhouse gas emissions.

- ***Renewable Diesel*** – DGS requires that bulk fuel purchases to supply state vehicles be renewable diesel, with limited exemptions. Through this and other bold actions, the state fleet met and exceeded the 20% petroleum reduction goal of Assembly Bill (AB) 236 (2007) three years earlier than the 2020 requirement.
- ***ZEV Charging*** – DGS created the Office of Sustainability Transportation Unit, a dedicated team installing needed fleet and workplace ZEV charging infrastructure for all state agencies, recognizing that timely development and implementation of ZEV charging infrastructure is integral to ZEV adoption and the successful electrification of the state fleet. The program prioritizes meeting the needs of the ZEVs in the state fleet, as well as a target of equipping at least 5% of all workplace parking spaces with EV charging to give state employees confidence that they have ZEV fueling options at the workplace. To date, DGS has installed over 2,100 charging ports and anticipates installing a total of 6,000 ports by the end of 2025.
- ***ZEV Mass Transit Bus Procurement*** – DGS' Procurement Division initiated a Request for Proposals for mass transit electric buses and awarded multiple contracts for different ZEV bus types. As a result, mass transit agencies throughout the state are leveraging our procurement contract for high-quality, low-cost ZEV buses meeting mass transit specifications. So far, 14 ZEV buses have been purchased through our procurement contract.

Energy

- ***Zero Net Energy Policy*** – DGS developed a statewide zero net energy (ZNE) policy in 2017, requiring all new state buildings beginning design after October 2017 to be constructed to ZNE standards – the first (and only) enacted policy of its kind in the nation. In 2015 DGS had no ZNE buildings. By the end of 2020, 46% of DGS buildings qualified to be part of the DGS ZNE portfolio. During 2021, three new ZNE office buildings were completed, and two more existing buildings met efficiency targets, helping DGS achieve ZNE status for 66% of its building area, exceeding the 2025 target goal of 50% as established in Executive Order B-18-12, four years early.
- ***Electrification in New Construction*** – DGS is prioritizing all electric new buildings where financially and technically feasible. The 10th & O Street office space built for the Legislature during renovation of the Capitol Annex and the new Richards Blvd. campus (1.2 million sq. ft.) will be completely electrified with no use of natural gas, to further reduce DGS carbon emissions.
- ***Energy Efficient Buildings*** – Through energy efficiency retrofits and conservation, DGS achieved a 25% improvement in energy efficiency compared to 2003.

From 2017 - 2020, the program has completed retrofits saving over 20 million kilowatt hours annually (MkWh), equivalent to the power used for nearly 2,000 homes.

- ***Onsite Renewable Energy Generation*** – Senate Bill (SB)100 established a landmark policy requiring that renewable energy and zero-carbon resources supply 100% of electric retail sales to end-use customers by 2045. SB 1020 (Laird) established an earlier date for 100% state agency renewable energy purchases by 2034. Through power purchase agreements for on-site renewables, DGS assists all departments in achieving renewable energy goals. Over 75 megawatts (MW) have been installed to date and by 2023, DGS has a goal to have over 100 megawatts of solar and wind generation installed at state facilities. DGS has installed 6.1 MW of onsite solar at three DGS facilities and is working to install more.
- ***Community Solar Agreement*** – DGS entered two community solar agreements (SolarShares) with the Sacramento Municipal Utility District (SMUD) over the last six years. This innovative approach provides utility cost savings to the state and gave our local Sacramento utility the customer commitment they needed to justify further solar farm developments and investments. This commitment created enough energy to power 8,200 homes per year, will reduce the equivalent of 30,000 metric tons of greenhouse gases annually, and save the state millions in energy costs over the next 20 years. Renewable energy powers 44% of the entire DGS portfolio.
- ***Green Leasing*** – DGS requires Leadership in Energy and Environmental Design (LEED) certification and many energy standards for leases it negotiates for state agencies, and recently won a national green leasing award.

Water Efficiency and Conservation

- ***Water Use Reduction*** – DGS successfully exceeded Executive Order B-18-12's target of reducing water usage by 20% as compared to 2010 baseline, by reducing 27%. DGS is on target to reduce water usage by 15% by end of 2021 as compared to 2020 water total usage in response to Governor's Gavin Newsom's 2021 Executive Order N-10-21.

Green Operations

- ***LEED Certified Buildings*** – DGS developed and consistently applies the state's mandate for LEED certified buildings for over 16 years, resulting in more than 10 million square feet of LEED certified buildings (55% of the DGS portfolio). DGS managed the design, construction, and/or leasing of most of the state's 240 LEED certified buildings.
- ***Greenhouse Gas Emissions Reductions*** – DGS reduced its greenhouse gas emissions (GHGe) by 66% (compared with 2010 levels), more than tripling the state's 20% by 2020 target. This was done through fuel-efficient and zero-

emission vehicle use, energy reduction efforts, large amounts of renewable energy, and wise water and green building operations.

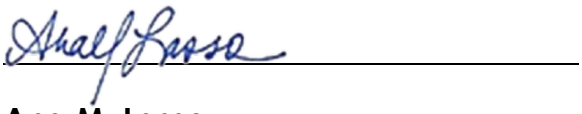
- ***Environmentally Preferable Purchasing*** – DGS leads the state's environmentally preferable purchasing (EPP) efforts developing state contracts for products and services with reduced environmental impacts. Now, for the first time, DGS is able to measure purchases of (EPP) products through the state's FI$CAL purchasing program.

State Partnerships

- ***Sustainable Building Working Group*** – DGS manages the Sustainable Building Working Group engaging 36 state agencies, other branches of government, and all major California utilities to implement sustainability into state operations.

The following Sustainability Roadmap report summarizes the outstanding accomplishments of DGS toward achieving many state sustainability goals and targets, and outlines steps to further this work in the future. DGS is moving aggressively forward with the necessary work to establish and implement actions in support of decarbonization goals to further reduce environmental impacts of state operations, and continuing efforts to lead and support all state agencies in achieving these goals.

Director Signature



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Director

CHAPTER 1 - CLIMATE CHANGE ADAPTATION

Executive Order B-30-15 directs State Agencies to integrate climate change into all planning and investment. Planning and investment can include the following:

- Infrastructure and capital outlay projects
- Grants,
- Development of strategic and functional plans,
- Permitting,
- Purchasing and procurement,
- Guidance development,
- Regulatory activity,
- Outreach, and education.

This report focuses on the first three of these activities, and follows the guidance created by the Technical Advisory Group developed under EO B-30-15 to assist State Agencies in completing this task.

Further, Executive Order N-19-19 directs the reduction of GHG emissions in state operations.

Facility climate risk data has been included in Facility Data Sheets as indicated. The climate projections informing an evaluation of climate risk are detailed below.

Climate Change Risks to Facilities

For all infrastructure, it is important to assess the risk that a changing climate poses to an asset or project (e.g., sea level rise or increasing daily temperatures). It is also important to recognize the impact that an infrastructure project has on the surrounding community and the impacts on individual and community resilience (e.g., heat island impacts).

To determine how to consider climate change for a given project or plan or existing infrastructure, this department will consider the following screening questions.

a. What is the lifetime of the facility, planned project, or plan?
b. Could it be affected by changing average climate conditions or increases in extreme events over its lifetime? (see *Planning & Investing for a Resilient California Guidebook.)*
c. What are the consequences of that disruption?
d. Will that disruption affect vulnerable populations, critical natural systems, critical infrastructure, or other assets?
e. Will that disruption cause irreversible effects or pose an unacceptable risk to public health and safety?

Natural Infrastructure to Protect Facilities

EO B-30-15 directs State agencies to prioritize the use of natural and green infrastructure solutions. Natural infrastructure is the "*preservation or restoration of ecological systems or the utilization of engineered systems that use ecological processes to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but need not be limited to, flood plain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days*" (Public Resource Code Section 71154(c)(3)).

Understanding the Potential Impacts of Facilities on Communities

DGS recognizes the impact that an infrastructure project has on the surrounding community and the impacts on individual and community resilience (e.g., heat island impacts).

Climate change disproportionately impacts vulnerable communities, with certain populations experiencing heightened risk and increased sensitivity to climate change and having less capacity to recover from changing average conditions and more frequent and severe extreme events. A number of factors contribute to vulnerability, often in overlapping and synergistic ways. These can include a number of social and economic factors, and be determined by existing environmental, cultural, and institutional arrangements. Vulnerable populations can include, but are not limited to, people living in poverty; people with underlying health conditions; incarcerated populations; linguistically or socially isolated individuals; communities with less access to healthcare or educational resources; or communities that have suffered historic exclusion or neglect.

Understanding Climate Risk to Existing Facilities

Of the 32 internationally recognized course-resolution GCMs, the State of California has chosen four models to utilize in its climate studies for the Fourth Assessment.[1] The following four models were selected to capture a range of different climate futures:

- Model 1: HadGEM2-ES characterizes a warm and dry future (warm/dry)
- Model 2: CNRM-CM5 characterizes a cool and dry future (cool/wet)
- Model 3: CanESM2 characterizes an average future condition (average)
- Model 4: MIROC5 provides a complement to the above models, and covers a range of outputs

1 Pierce, D.W., D.R. Cayan, L. Dehann. June 2016. Creating Climate projections to support the 4th California Climate Assessment.

- Concentration Pathway (RCP) 8.5. These model results have been downscaled to provide projections of climate impacts on a finer scale across California.

Risk from Changing Extreme Temperatures

Table 1.1: Top 9 Facilities that Will Experience the Largest Increase in Extreme Heat Events

Facility Name	Extreme heat threshold (EHT) °F	Ave. # of days above EHT (1961-1990)	Ave. # of days above EHT (2031-2060)	Change from historical to proj'd ave # of days above EHT (2031-2060)	Avg. # days above EHT (2070-2099)	Change from historical to proj'd ave # of days above EHT (2070-2099)
753 Fresno Water Resources	106.3	4.4	28.4	24.0	55.0	50.5
701 Fresno State Building	106.6	4.4	25.2	20.7	50.8	46.3
460 Redding State Building	108.1	4.4	20.0	15.5	49.8	45.4
330 California Tower (Riverside)	103.6	4.4	27.2	22.8	47.4	43.0
095 Central Plant	103.5	4.4	21.7	17.2	43.6	39.2
106 State Record Ctr and Whse	103.5	4.4	21.7	17.2	43.6	39.2
084 Franchise Tax Board Cmplx	104.0	4.4	21.1	16.6	42.6	38.2
051 thru 054 East End Complex	103.9	4.4	20.7	16.3	41.3	36.9

Table 1.2 a: Top 10 Facilities Most Affected by Changing Temperature – Annual Mean Max. Temp

Facility Name	Historical Annual Mean Max. Temp. (1961 – 1990)	Annual Mean Max. Temp. (2031 – 2060)	Change from Historical to Annual Mean Max. Temp (2031-2060)	Annual Mean Max Temp. (2070-2099)	Change from Historical to Annual Mean Max. Temp (2070-2099)
330 California Tower (Riverside)	78.0	83.6	5.6	86.9	9.0
901 Stockton State Building	74.1	79.0	4.9	82.9	8.8
084 Franchise Tax Board Complex	74.3	79.2	4.9	82.8	8.6
095 Central Plant	74.0	78.9	4.9	82.5	8.5
028 Board of Equalization Building	74.0	78.9	4.9	82.5	8.5
106 State Record Center and Whse.	74.0	78.9	4.9	82.5	8.5
753 Fresno Water Resources Building	76.5	81.2	4.7	85.0	8.5
001 State Capitol Building	74.2	79.0	4.9	82.7	8.5
051 thru 054 East End Complex	74.2	79.0	4.9	82.7	8.5
049 Education Bldg (East End #225)	74.2	79.0	4.9	82.7	8.5

Table 1.2 b: Top 10 Facilities Most Affected by Changing Temperature- Annual Mean Min Temp

Facility Name	Historical Annual Mean Min. Temp. (1961 – 1990)	Annual Mean Min. Temp. (2031 – 2060) °F	Change from Annual Mean Min. Temp (2031-2060)	Annual Mean Min. Temp. (2070-2099 °F	Change from Annual Mean Min. Temp (2070-2099)
901 Stockton State Building	46.41	51.17	4.76	55.19	8.78
330 California Tower	49.56	54.43	4.87	58.20	8.64
753 Fresno Water Resources	49.51	54.04	4.53	57.92	8.41
701 Fresno State Building	49.73	54.22	4.49	58.08	8.35
461 Red Bluff State Building	50.47	54.87	4.40	58.78	8.31
460 Redding State Building	51.09	55.34	4.24	59.34	8.25
530 Van Nuys State Building	50.50	54.68	4.18	58.62	8.12
028 Board of Equalization	48.74	53.07	4.33	56.86	8.12
095 Central Plant	48.74	53.07	4.33	56.86	8.12
106 State Record Center	48.74	53.07	4.33	56.86	8.12

Heating and Cooling Degree Days

A Heating Degree Day (HDD) is the number of degrees by which a daily average temperature is below 65 degrees Fahrenheit. That reference temperature represents an average daily temperature *above which* space heating is not needed. The average temperature is represented by the average of the maximum and minimum daily temperature. Similarly, a Cooling Degree Day (CDD) is the number of degrees by which a daily average temperature exceeds 65 degrees Fahrenheit. That reference temperature represents an average daily temperature *below which* space cooling (e.g., air conditioning) is not needed.

DGS will consider how CDD and HDD could affect facilities' operations and costs. In identifying facilities most at risk, considerations include: location and criticality of facility, operations and criticality of its operations, impacts of current temperature events, sensitivity of operations to temperature changes, the impact of disruption, and sensitivity/vulnerability of the population or area served by a facility.

Table 1.3a: Top 10 Facilities that will be Most Impacted by Projected Changes in Heating Degree Days (HDD)

Facility Name	Historical Ave. Heating Degree Days (1961-1990) (HDD)	Heating Degree Days (2031-2060) (HDD)	Change from Historical Heating Degree Days to (2031-2060)	Heating Degree Days (2070-2099) (HDD)	Change from Historical Heating Degree Days to (2070-2099)
418 Public Utilities Commission Building	2879	1671	-1208	1009	-1869
480 Santa Rosa State Building	3052	2074	-977	1491	-1561
602 Elihu Harris Building	2530	1579	-950	1053	-1477
901 Stockton State Building	2805	1844	-960	1338	-1467
470 San Jose State Bldg (Alquist)	2414	1510	-904	1015	-1399
028 Board of Equalization Bldg	2588	1758	-830	1317	-1271
095 Central Plant	2588	1758	-830	1317	-1271
106 State Record Ctr and Whse	2588	1758	-830	1317	-1271
084 Franchise Tax Board Complex Buildings	2488	1668	-820	1238	-1250
461 Red Bluff State Building	2593	1779	-814	1346	-1247

Table 1.4b: Top 10 Facilities that will be Most Impacted by Projected Changes in Cooling Degree Days (CDD)

Facility Name	Historical Ave. Cooling Degree Days (1961-1990) (CDD)	Cooling Degree Days (2031-2060) (CDD)	Change from Historical Cooling Degree Days to (2031-2060)	Cooling Degree Days (2070-2099) (CDD)	Change from Historical Cooling Degree Days to (2070-2099)
509 Ronald Reagan State Bldg	1369	2524	1155	3427	2058
330 California Tower (Riverside)	1377	2628	1251	3405	2028
520 Santa Ana State Building	1044	2091	1048	2957	1914
512 Junipero Serra (Broadway State Bldg)	1155	2167	1012	3047	1892
753 Fresno Water Resources Building	1853	2964	1111	3726	1873
701 Fresno State Building	1880	2982	1103	3740	1860
460 Redding State Building	2035	3058	1023	3874	1839
461 Red Bluff State Building	1908	2916	1008	3727	1819
530 Van Nuys State Building	955	1942	987	2739	1784
084 Franchise Tax Board Complex Buildings	1375	2395	1020	3157	1781

- Increased temperatures will affect facility operations as these buildings age by:
  - Requiring considerations for how cooling equipment is modernized as the building ages into a warmed future.
  - Planning for changes in energy sources in an effort to help counteract the changes in the climate.
  - Ensuring that the building is maintained to its energy efficiency design and to avoid allowing changes to the building that counteract these original design goals.
- The top facilities shown here have been chosen for factors that include:
  - Magnitude of temperature change,
  - Sensitivity of operations to changing temperatures,
  - Sensitivity/vulnerability of the population or area served by a facility,
  - Criticality of the facility to avoid disruption.

- The building facilities most likely to be most impacted by an increase in extreme heat events are the mechanical heating and cooling systems. All buildings are designed to the conditions the building will operate in when first occupied. Trying to size cooling systems for 20+ years into the future would have the equipment operating below its most efficient standards for most of its expected services life. DGS seeks to plan for how adaptable the building can be when the time comes to introduce new or differently configured equipment in the future when the life cycle dictates replacement.
- DGS will utilize strategies to reduce the impact of changing temperatures, and HDD/CDD, on facility performance to protect occupant health and safety including planning for future additional HVAC capacity, shade structures or tree planting.
- Buildings constructed recently and in the near future will likely be considered historically significant by the end of century. The future stewards of these buildings will be challenged with adapting them to conditions that cannot be accurately predicted today. Longer-term impacts that could affect facility performance will be reliant on the advances in building technologies that hopefully will have been developed at that time.

Urban Heat Islands

Urban heat islands are areas with localized spikes in temperature, which impact human health, increase pollution, and increase energy demand. Urban heat islands occur during the hot summer months in areas with higher percentages of impervious surface and less vegetation. This commonly happens in areas with large parking lots, dense development, and lower tree density and shading. Urban heat islands can be mitigated through tree planting and other greening measures, cool roofs), cool pavements, and other measures.

Table 1.5: Facilities Located in Urban Heat Islands

Facility Name	Located in an urban heat island (yes/no)
Stockton State Bldg.	Yes
Fresno State Bldg.	Yes
California Tower Riverside Office Bldg.	Yes
State Record Center and Whse.	Yes
Junipero Serra Bldg.	Yes
Archives Parking-Fleet Lot 55	Yes
Blue Anchor Bldg.	Yes
CalEPA Headquarters	Yes
DOJ Daycare Center	Yes
R Street Warehouse	Yes
EDD Annex	Yes

EDD Building	Yes
Fleet Admin Lot 33	Yes
Fleet Admin Lot 39	Yes
Bateson Bldg.	Yes
Jesse Unruh Bldg.	Yes
Attorney General Building	Yes
Legislative Garage - LOT 50	Yes
Library and Courts II	Yes
Bonderson Parking Garage	Yes
Office Buildings 8 & 9	Yes
Bonderson Bldg.	Yes
Personnel Bldg.	Yes
Dept. of Rehabilitation	Yes
Resources Bldg.	Yes
074 Sacramento State Garage Lot 2	Yes
Secretary of State Bldg.	Yes
Library and Courts Bldg.	Yes
State Capitol	Yes
CEC Building	Yes
Annex Swing Space (10th & O)	Yes
New Natural Resources Building	Yes
Clifford Allenby State Office Building	Yes
Van Nuys State Bldg.	Yes
Ronald Reagan State Bldg.	Yes
San Diego State Bldg.	Yes
Santa Ana State Bldg.	Yes
Fresno Water Resources Bldg.	Yes

There are now 38 DGS facilities located in urban heat island locations. The three new buildings on this list were constructed applying measures following the State's commitment to reducing the heat island. Significantly, the measures include the first vegetative roof on a high-rise State-owned building in Sacramento. These new projects sites were also selected to take advantage of their proximity to mass transit which has allowed them to be developed with little to no surface parking.

The other existing buildings in heat islands will have their roofs replaced with cool roofs including increased rooftop insulation when roof replacement is needed. Landscaping that includes shade trees will be maintained and trees that have to be removed in the future due to age, disease or storm damage will be replaced with similar large shade trees.

Risks from Changes in Precipitation

The impacts of climate change on the amount of precipitation that California will receive in the future are slightly less certain that the impacts on temperature. However, it is expected that California will maintain its Mediterranean climate pattern (dry summers and wet winters), but more precipitation will fall as rain than as snow. It is also likely that extremes will intensify, both drought and heavy precipitation events. Larger rains can result in flooding but will also result in shifts in runoff timing (earlier) and runoff volumes (higher). It could also result in decreased snowpack recharging existing reservoirs.

Table 1.6: Top 12 Facilities that will be Most Impacted by Projected Changes in Precipitation

Facility Name	Historic Ave. Precip. 1961-1990 (in/yr)	Ave. Annual Modeled Precip., 2031-2060 (in/yr)	% Change in Precip by Mid-Century	Ave. Annual Modeled Precip., 2070-2099 (in/yr)	% Change in Precip by End of Century	Extreme Precip. (in/day) 1961-1990	Extreme Rainfall, Modeled Ave., 2031-2060 (in/day)	Extreme Rainfall, Modeled Ave. 2070-2099 (in/day)
418 Public Utilities Commission	19.40	23.84	23%	25.45	31%	4.02	4.25	5.28
480 Santa Rosa State Building	29.89	35.26	18%	38.36	28%	6.23	6.61	7.20
602 Elihu Harris Bldg.	19.83	23.34	18%	25.20	27%	4.64	4.26	5.29
075 DOJ Building	18.25	21.11	16%	23.09	27%	4.75	4.99	6.43
095 Central Plant	17.96	20.98	17%	22.60	26%	4.28	4.70	5.70
106 State Record Ctr and Whse	17.96	20.98	17%	22.60	26%	4.28	4.70	5.70
001 State Capitol Building	18.68	21.73	16%	23.47	26%	4.64	4.90	6.18
049 Education Building	18.68	21.73	16%	23.47	26%	4.64	4.90	6.18
051 thru 054 East End Complex	18.68	21.73	16%	23.47	26%	4.64	4.90	6.18
091 Blue Anchor Building	18.68	21.73	16%	23.47	26%	4.64	4.90	6.18
010 Dept. of Rehabilitation	18.68	21.73	16%	23.47	26%	4.64	4.90	6.18
030 Att. Gen Bldg.	18.68	21.73	16%	23.47	26%	4.64	4.90	6.18

These buildings are projected to have the largest percentage increases in precipitation in the coming decades. Without a commitment to improve area drainage by the cities of Sacramento, San Francisco, and Santa Rosa access to these buildings could be impacted during flooding events.

Maintenance funding needs to keep up with needs to preserve the integrity of the roofs and siding for these buildings. Preserving the envelope of buildings is the best way to preserve these buildings from damage by the anticipated increased rainfall totals.

Risks from Sea Level Rise

Increasing global temperatures are contributing to rising sea levels. Rising sea levels will result in inundation of coastal areas and increased flooding due to storm surges. The California Ocean Protection Council (OPC) has issued the State of California Sea-Level Rise Guidance (Guidance) for State agencies on what level of sea level rise projections to consider in planning.

There are some assets that are not currently located in an area that is currently considered the coastal zone or vulnerable to coastal flooding. However, with rising seas, they may become vulnerable. An example that an asset that is inland may become exposed at 2050 and/or 2100 is listed below.

Table 1.7 : All Facilities at Risk from Rising Sea Levels

Facility Name	Tide Chart Region	2050 Water Level (ft)	Exposed at 2050? (y/n)	2100 Water Level (ft)	Exposed at 2100? (y/n)
Stockton State Building	Delta	N/A	N/A	0.327	Y

Currently there is only one DGS facility at risk of sea level rise from the Delta. This building is also one that has not aged well and has a host of maintenance issues that would require costly measures to repair. DGS will address the risk of sea level rise by either demolishing the existing building and constructing its own new building on the site (taking care to mitigate the sea level rise risks in the new design), or DGS will surplus sale the property and relocate the current state employees to areas outside of the risk zone.

Risks from Wildfire

Wildfire is a serious hazard in California. Several studies have indicated that the risk of wildfire will increase with climate change. Importantly, we are already seeing more extreme wildfire seasons that are longer and with more extreme wildfires. By 2100, if greenhouse gas emissions continue to rise, one study found that the frequency of extreme wildfires would increase, and the average area burned statewide would increase by 77 percent.

Wildfire hazard is also a critical issue in the present. Six of California's seven largest fires all occurred in 2021 & 20202. 2017 and 2018 previously set records as the most destructive fire seasons in California's history3. To contextualize how wildfire hazards

2 https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf

3 https://www.fire.ca.gov/incidents/2017/ ; https://www.fire.ca.gov/incidents/2018/

already impact California's facilities, consider that 1 in 5 California children were affected by wildfire-related school closures during the 2018-2019 school year4.

The buildings listed in Table 1.7 below have been included only for their relatively closer proximity to outlying high fire risk areas in comparison to the other buildings owned and managed by DGS.

Table 1.8: Top Facilities Most at risk to current wildfire threats

Facility Name	Fire Hazard Severity Zone (low, medium, high, very high)
Red Bluff State Building	High

These buildings are not in directly threatened locations. However, their proximity to higher risk areas means that access to the buildings and the high likelihood that the majority of building occupants could have their personal residences displaced by a major wildfire means that operations and the services provided by these buildings could be severely impacted in the event of a nearby wildfire.

Table 1.9: Top Facilities that will be Most Impacted by Projected Changes in Wildfire

Facility Name	Acres Burned (1961-1990)	Acres Burned (2031-2060)	Acres Burned (2070-2099)
Red Bluff State Building	3.2442	2.6339	2.0234
Santa Rosa State Building	2.4585	2.5781	2.9933

DGS buildings are located in city centers which only show a decreasing impact from projected changes in wildfire. The Santa Rosa State Building is the only building located where the projected acers burned increase over the coming decades, but as illustrated in the table above, the increases here are negligible.

Summarizing Natural Infrastructure Actions to Protect Existing Facilities

Existing facilities can be adapted to add natural infrastructure that was not considered important and/or too expensive at the time of construction. Many contemporary building projects have things such as onsite electrical generation value engineered out of the project before construction begins. Installing the systems that were put off for future investments needs to be budgeted for future improvements to the site. Existing parking lots can have water detention and ground water recharge improvements added at the time that they require resurfacing maintenance. As mentioned before, shade trees need to be replaced when external factors require their removal.

4 https://calmatters.org/projects/california-school-closures-wildfire-middletown-paradise-disaster-days/?

Understanding the Potential Impacts of Facilities on Communities

As described at the beginning of the chapter, impacts on communities must be considered for resilience planning for State assets and buildings.

Disadvantaged Communities

California is required to invest certain funding streams in disadvantaged communities (DACs). Many state programs that have DAC funding requirements use CalEnviroScreen, a tool that ranks census tracts based on a combination of social, economic, and environmental factors, to identify DACs. While it does not capture all aspects of climate vulnerability, it is one tool that is available, and does include several relevant characteristics. The department's facilities located in these communities can contribute or alleviate the vulnerability of these Disadvantaged Communities.

Table 1.10: Facilities located in disadvantaged communities.

Facility Name	CalEnviroScreen Score	Is it located in a disadvantaged community? Yes/No
Stockton State Bldg.	96-100%	Yes
Fresno State Bldg.	96-100%	Yes
CA Tower Riverside Office Bldg.	96-100%	Yes
State Record Center & Whse.	91-95%	Yes
Junipero Serra Office Bldg.	91-95%	Yes
Blue Anchor Bldg.	86-90%	Yes
DOJ Daycare Center	86-90%	Yes
R Street Warehouse	86-90%	Yes
EDD Annex	86-90%	Yes
EDD Building	86-90%	Yes
Bateson Bldg.	86-90%	Yes
Jesse Unruh Bldg.	86-90%	Yes
030 Attorney General Building	86-90%	Yes
LEGISLATIVE GARAGE - LOT 50	86-90%	Yes
Library and Courts II Annex	86-90%	Yes
Bonderson Garage - Lot 24	86-90%	Yes
Office Buildings 8 & 9	86-90%	Yes
Bonderson Bldg.	86-90%	Yes
Personnel Bldg.	86-90%	Yes
Dept. of Rehabilitation	86-90%	Yes
Resources Bldg.	86-90%	Yes
Annex Swing Space (10th & O)	86-90%	Yes
New Natural Resources Building	86-90%	Yes
Clifford Allenby State Office Bldg.	86-90%	Yes
074 Sacramento State Garage	86-90%	Yes

Secretary of State Bldg.	86-90%	Yes
Library and Courts Bldg.	86-90%	Yes
State Capitol	86-90%	Yes
CEC Bldg.	86-90%	Yes
Van Nuys State Bldg.	86-90%	Yes
Ronald Reagan State Bldg.	86-90%	Yes
San Diego State Bldg.	81-85%	Yes
Fresno Water Resources Bldg.	76-80%	Yes

A major function of state government is to serve the disadvantaged communities in California. It is no coincidence that most of the buildings DGS maintains have been located in these communities. The list above identifies 34 buildings within disadvantaged communities. These buildings house agencies and the seat of California state government, which directly provides services to disadvantaged communities. DGS must be mindful of how state operations impact our neighbors in disadvantaged communities.

Understanding Climate Risk to Planned Facilities

Table 1.11 a-g: Climate Risks to New Facilities

a.1 – New Facilities Most Affected by Changing Temperature – Annual Mean Max. Temp

Facility Name	Historical Annual Mean Max. Temp. (1961 – 1990)	Annual Mean Max. Temp. (2031 – 2060)	Change from Historical to Annual Mean Max. Temp (2031-2060)	Annual Mean Max Temp. (2070-2099)	Change from Historical to Annual Mean Max. Temp (2070-2099)
1021 O Street	74.16	79.013	4.8525	82.665	8.505
New Natural Resources Building	74.16	79.013	4.8525	82.665	8.505
Clifford Allenby State Office Bldg	74.16	79.013	4.8525	82.665	8.505
Richards Blvd. Office Complex	74.16	79.013	4.8525	82.665	8.505
Bateson Office Bldg Modernization	74.16	79.013	4.8525	82.665	8.505
018 Resources Bldg Modernization	74.16	79.013	4.8525	82.665	8.505

a.2 - New Facilities Affected by Changing Temperature – Annual Mean Min. Temp

Facility Name	Historical Annual Mean Min. Temp. (1961 – 1990)	Annual Mean Min. Temp. (2031 – 2060) °F	Change from Annual Mean Min. Temp (2031-2060)	Annual Mean Min. Temp. (2070-2099 °F	Change from Annual Mean Min. Temp (2070-2099)
1021 O Street	49.46	53.685	4.225	57.448	7.9875
New Natural Resources Building	49.46	53.685	4.225	57.448	7.9875
Clifford Allenby State Office Building	49.46	53.685	4.225	57.448	7.9875
Richards Blvd. Office Complex	49.46	53.685	4.225	57.448	7.9875
Bateson Office Bldg Modernization	49.46	53.685	4.225	57.448	7.9875
Natural Resources Bldg Modernization	49.46	53.685	4.225	57.448	7.9875

b. New Facilities Most Affected by Changing Temperature – Annual Mean Min. Temp

Facility Name	Annual Mean Maximum precipitation (1961-1990) (in/yr)	Annual Mean precipitation (2031-2060) (in/yr)	Extreme Precip (1961-1990) (in/day)	Extreme Precip (2031-2060) (in/day)
1021 O Street	18.681	21.728	4.6408	4.8982
New Natural Resources Bldg	18.681	21.728	4.6408	4.8982
Clifford Allenby State Office Bldg	18.681	21.728	4.6408	4.8982
Richards Blvd. Office Complex	18.681	21.728	4.6408	4.8982
Bateson Office Bldg Modernization	18.681	21.728	4.6408	4.8982
Natural Resources Building Modernization	18.681	21.728	4.6408	4.8982

c. New Facilities Most Affected by Increase in Extreme Heat Days

Facility Name	Extreme heat threshold (EHT) °F	Average number of days above EHT (1961-1990)	Average number of days above EHT (2031-2060)	Increase in number of days above EHT
1021 O Street	103.91	4.4138	20.672	41.336
Clifford Allenby State Office Bldg	103.91	4.4138	20.672	41.336
New Natural Resources Building	103.91	4.4138	20.672	41.336
Richards Blvd. Office Complex	103.91	4.4138	20.672	41.336
Bateson Office Building Modernization	103.91	4.4138	20.672	41.336
Natural Resources Building Modernization	103.91	4.4138	20.672	41.336

d. New Facilities Most Affected by Sea Level Rise

Facility Name	Area (California Coast, San Francisco Bay, Delta)	Sea Level Rise 0.0 m	Sea Level Rise 0.5 m	Sea Level Rise 1.0 m	Sea Level Rise 1.41 m
None in Portfolio					

e. New Facilities Most at risk to current wildfire threats

Facility Name	Current Fire Hazard Severity Zone (low, medium, high, very high)
1021 O Street	LOW
Clifford Allenby State Office Bldg	LOW
New Natural Resources Building	LOW
Richards Blvd. Office Complex	LOW
Bateson Office Building Modernization	LOW
Natural Resources Building Modernization	LOW

f. New Facilities most Impacted by Projected Changes in Wildfire

Facility Name	Acres Burned (1961-1990)	Acres Burned (2031-2060)
Annex Swing Space (10th & O)	0	0
Clifford Allenby State Office Bldg	0	0
New Natural Resources Building	0	0
Richards Blvd. Office Complex	0	0
Bateson Office Building Modernization	0	0
Natural Resources Building Modernization	0	0

g. New Facilities most Impacted

Facility Name	Heating/Cooling Degree Days (1961-1990) (HDD/CDD)	Heating/Cooling Degree Days (2031-2060) (HDD/CDD)
Annex Swing Space (10th & O)	2497.6/1332	1688.7/2353
Clifford Allenby State Office Bldg	2497.6/1332	1688.7/2353
New Natural Resources Building	2497.6/1332	1688.7/2353
Richards Blvd. Office Complex	2497.6/1332	1688.7/2353
Bateson Office Bldg Modernization	2497.6/1332	1688.7/2353
Natural Resources Building Modernization	2497.6/1332	1688.7/2353

These new buildings are being designed with the highest degrees of insulation passive and energy efficient active heating and cooling systems.

Table 1.12: New Facilities and Disadvantaged Communities and Urban Heat Islands

Facility Name	Located in a Disadvantaged Community (yes/no)	Located in an urban heat island (yes/no)
Annex Swing Space (10th & O)	YES	YES
New Natural Resources Building	YES	YES
Clifford Allenby State Office Building	YES	YES
Richards Blvd. Office Complex	YES	YES
Bateson Office Building Modernization	YES	YES
Natural Resources Building Modernization	YES	YES

A major function of state government is to serve the disadvantaged communities in California. These new buildings are being constructed in the same neighborhoods to continue to provide job centers and support to the people in these communities. The Richards Boulevard project will bring more downtown services, job opportunities and vibrance than the former printing plant offered at the same site.

Natural Infrastructure

EO B-30-15 also directs agencies to prioritize natural and green infrastructure solutions. Natural infrastructure is the "preservation or restoration of ecological systems or the utilization of engineered systems that use ecological processes to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but need not be limited to, flood plain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days" (Public Resource Code Section 71154(c)(3)).

DGS owns and maintains buildings within major urban environments where natural systems are infeasible for restoration in a traditional sense. The challenge is to find creative ways to add some natural functions back to the sites these buildings occupy. In California, one of the most important restorations can be to add ground water recharging measures to open areas of the site such as landscaped and parking areas. This can be achieved by adding permeable water retention vaults that both reduce flood risk runoff from the hard surfaces and allowing captured water to naturally recharge the groundwater.

Full Life Cycle Cost Accounting

EO B-30-15 directs State agencies to employ full life cycle cost accounting in all infrastructure investment. Lifecycle cost accounting includes:

- Considering initial investment costs and lifetime operation and maintenance costs due to changing climate and average conditions and increasing extreme events.

- Applying non-market evaluation methods such as travel cost, avoided costs or contingent valuation to capture hard to quantify benefits and costs.

Integrating Climate Change into Department Planning and Funding Programs

EO B-30-15 extends beyond infrastructure to broader planning efforts. Using the tables below, indicate whether you have taken the following actions in your planning processes.

Table 1.13: Integration of Climate Change into Department Planning

Plan	Have you integrated climate?	If no, when will it be integrated?	If yes, how has it been integrated?
Climate Adaptation Policy	No	2022	Tentatively decarbonizing new projects

Table 1.14: Engagement and Planning Processes

Plan	Does this plan consider impacts on vulnerable populations?	Does this plan include coordination with local and regional agencies?	Does this plan prioritize natural and green infrastructure?
	No	No	No

Table 1.15: Climate Change in Funding Programs

Grant or funding program	Have you integrated climate change into program guidelines?	If no, when will it be integrated?	Does this plan consider impacts on vulnerable populations?	Does this program include coordination with local and regional agencies?
Water Conserv. Grants	Yes		Indirectly	Indirectly

Measuring and Tracking Progress

Changing climate conditions necessitate an adaptive management approach. An adaptive management approach is informed by tracking changing climate conditions and the performance of a plan or project. Building check points into a project or plan timeline can help to create a system for regular review and, if needed, adjustments.

- Climate change impacts of major concern are increasing temperatures, extreme heat events, drought, and energy reliability.
- DGS is working to make new facilities with improved building envelope and efficiency to address increasing temperatures.
- The DGS Office of Sustainability is developing policy for statewide climate change adaptation and resilience. The DGS Real Estate Services Division is

developing a similar internal policy for DGS projects. DGS is working to complete the policy in early 2023.

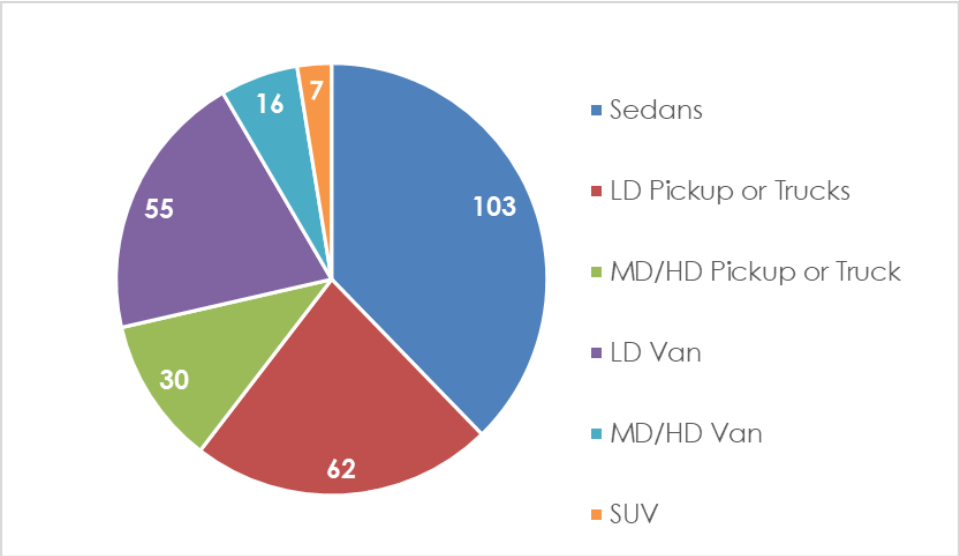
- The new policy will help guide state building designs and operations to better adapt to changing climates and associated risks and inform investments in state infrastructure.

CHAPTER 2 – ZERO-EMISSION VEHICLES

Department Mission and Fleet

This ZEV Report and Plan demonstrates to the Governor and the public the progress the Department has made toward meeting the Governor's sustainability goals related to Zero Emission Vehicles. This report identifies successful accomplishments, ongoing efforts, outstanding challenges and future efforts.

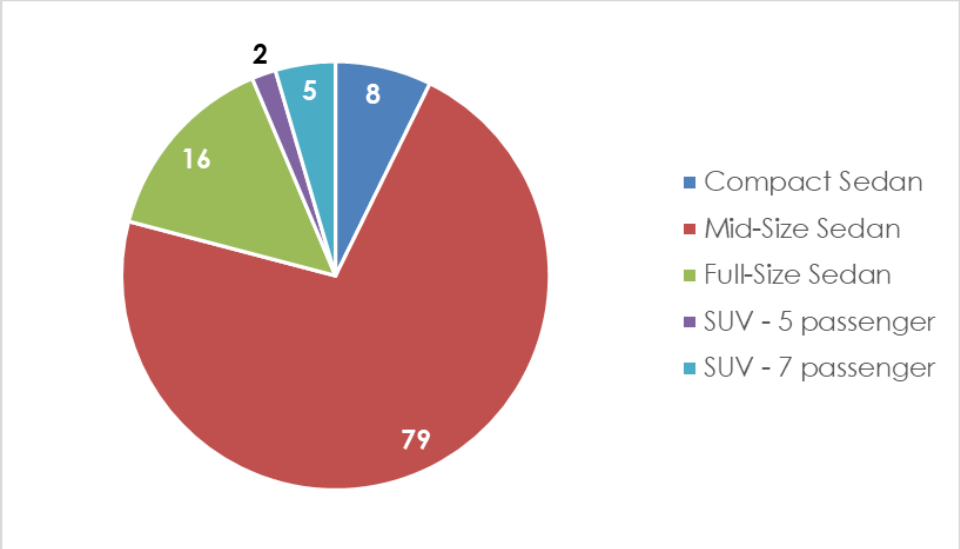
Graph 2.1: 2021 Composition of Vehicle Fleet



Light Duty Fleet Vehicles

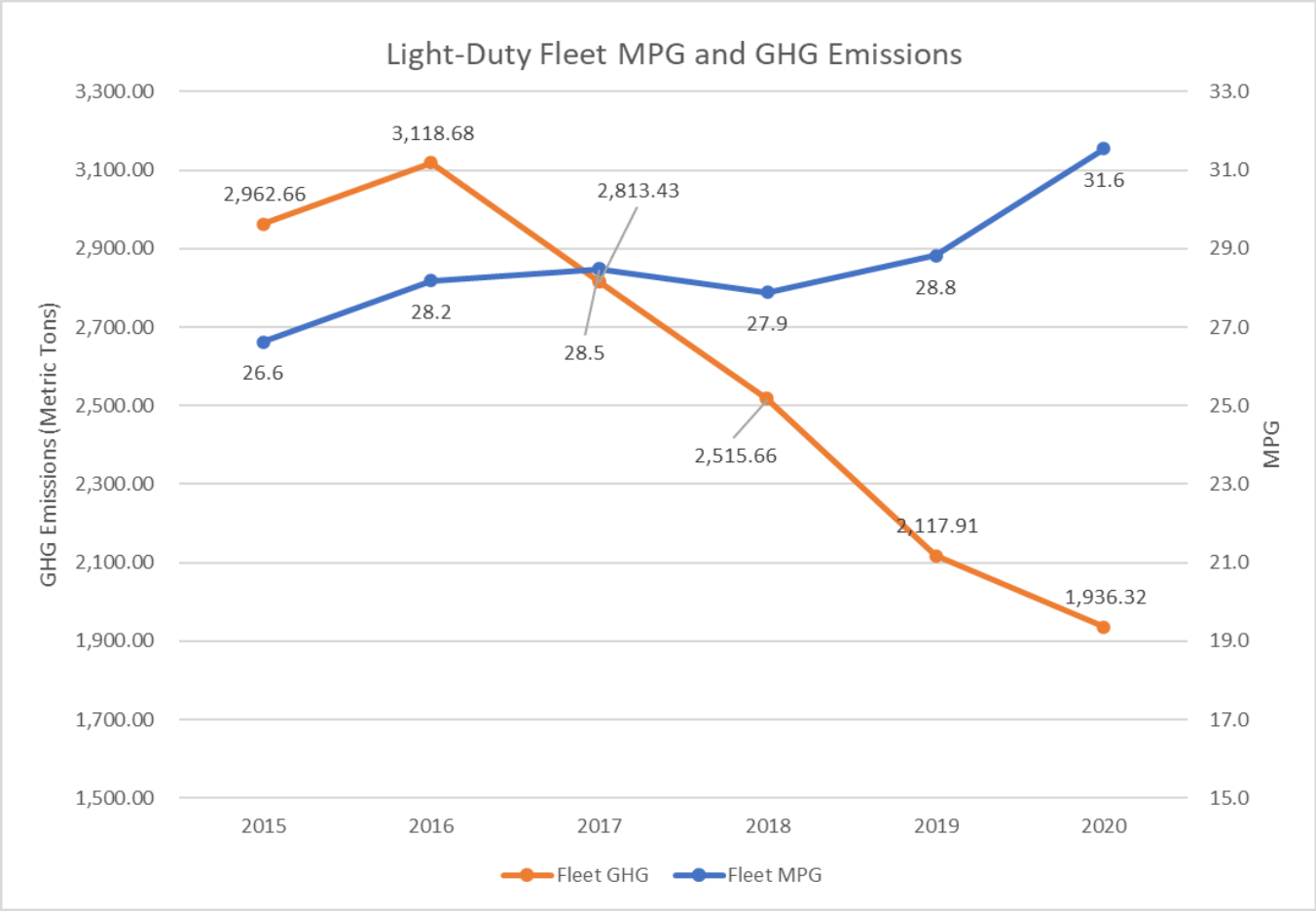
The DGS fleet is comprised primarily of light duty vehicles (sedans) that are used as pool vehicles or by DGS' statewide inspectors of automotive equipment. The vehicles operate throughout the state under various conditions (city driving, highway driving, off road, etc.) and are used in a wide variety of ways. Some vehicles are used daily, while others may be used intermittently as needed. Graph 2.2 below illustrates the makeup of DGS light-duty fleet vehicles as of this year.

Graph 2.2: Composition of Light Duty Vehicle Fleet Subject to the ZEV First Purchasing Mandate



From 2015 to 2020, DGS' fleet mileage per gallon (MPG) has increased by 18.8%, from an average of 26.6 MPG to a current average of 31.6 MPG. Additionally, DGS has reduced its fleet GHG emissions by approximately 1,026 metric tons from 2015 to 2020. In 2015, the department's GHG emissions totaled 2,962.7 metric tons, and in 2020 the total was reduced to 1,936.3 metric tons. This reduction is primarily a result of a reduction in the number of vehicles DGS operates, as well as efforts to introduce more fuel-efficient vehicles such as hybrid, plug-in hybrid, battery electric, and fuel-cell vehicles. See Graph 2.2 below for a year-over-year representation of DGS' MPG and GHG changes.

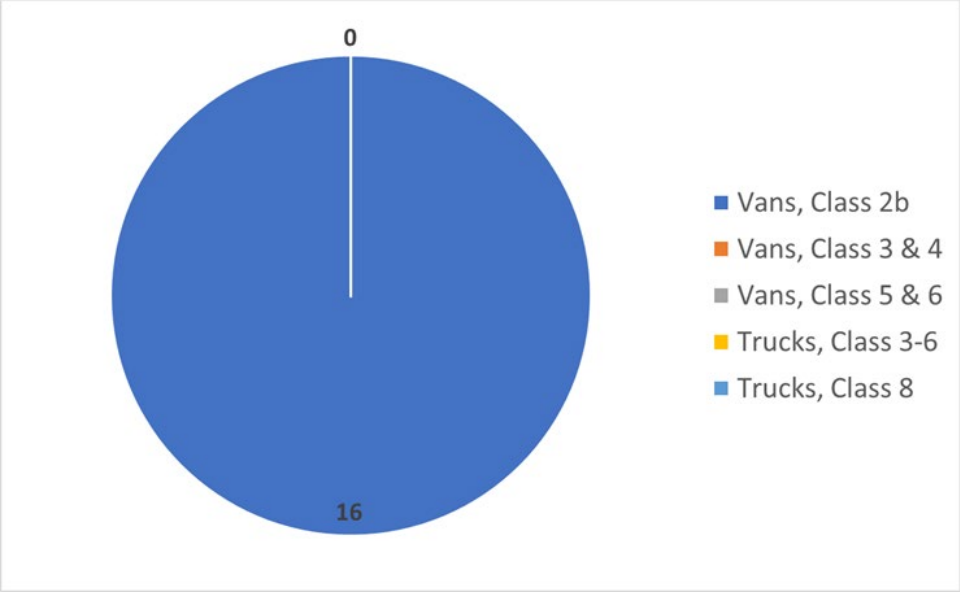
Graph 2.3: Light-Duty Fleet MPG & GHG Emissions



Medium and Heavy-Duty Fleet Vehicles

The remainder of the DGS fleet is comprised of medium-duty (MD) and heavy-duty (HD) vehicles. These vehicles are primarily used by the DGS Facilities Management Division (FMD) and Real Estate Services Division (RESD). They are used by maintenance and construction teams to haul equipment and tools to and from DGS-owned and -managed sites. FMD and RESD operations necessitate vehicles with large cargo and hauling capacity, so the majority of vehicles used for these divisions are pickup trucks and cargo vans.

Graph 2.4: Composition of Medium and Heavy-Duty Vehicle Fleet Subject to the ZEV First Purchasing Mandate



All 16 medium and heavy-duty vehicles in the DGS fleet that are subject to the ZEV First Purchasing Mandate are cargo and passenger vans. DGS has yet to purchase a ZEV medium or heavy-duty van but has identified these 16 vehicles as possible candidates for future purchases. It's important to note that as MD and HD ZEV vans become available on the mandatory state contract, DGS will ensure leasing programs are purchasing ZEVs where pragmatically feasible. The current MPG of the 16 vans stands at 13.09 based off recent fuel consumption and mileage totals.

Table 2.1: Total Fuel Purchased in 2020

	Diesel	Gasoline	Renewable Diesel
Fuel Amount Gallons	23.91	116,013	0

Incorporating ZEVs into the State Fleet

Pursuant to Executive Order (EO) B-16-12, state departments are required to increase the number of Zero Emission Vehicles (ZEV) within their state fleet. Departments are advised, as of January 1st, 2020, to purchase vehicles from authorized Original Equipment Manufacturers (OEMs) that have aligned with the California Air Resources Board (CARB). In addition, the state anticipates significant economic impacts from the COVID-19 pandemic which will result in a decrease in state revenues for fleet purchasing.

With these policies in place, departments should consider the most effective ways to incorporate ZEVs into their fleet.

Light-Duty ZEV Adoption

A widespread shift to ZEVs is essential for California to meet its Greenhouse Gas (GHG) emission goals. State departments are now required to incorporate a larger number of light-duty ZEVs in their vehicle fleets. Starting in FY 17/18 the percentage of new light duty vehicles that must be ZEVs began increasing by 5% each year, reaching 30% in FY 20/21 and 50% in FY 24/25.

ZEVs can fill a number of roles within DGS' fleet. Some battery electric vehicles (BEVs) are best used in short run applications due to their limited range. These short run applications could be pool vehicles that are primarily used by employees of a given building or unit for short trips around town or mail delivery services with short defined routes between DGS facilities in the Sacramento region. With the release of the Tesla Model 3 and Chevy Bolt, BEVs are increasingly being used in applications that require longer range capabilities. While most BEVs are in the sedan category, there are some larger cargo van and delivery truck BEVs available that can be used for delivery and transport functions.

Plug-in hybrid electric vehicles (PHEVs) can be used for almost any function that can be performed with a midsize sedan (or smaller), a five-passenger SUV, or a minivan. Due to the presence of a gas engine, PHEVs don't have the same range and public fueling infrastructure challenges that BEVs have. Some specific applications for PHEVs may be:

- Building managers who cover a large geographic area on any given day, but don't have to carry large amounts of equipment.
- Automotive inspectors who are assigned vehicles to travel from site to site in a given region.
- Interagency mail delivery vans.

Due to the limited fueling infrastructure for hydrogen, the use of fuel-cell vehicles (FCVs) is restricted to geographic regions that have enough hydrogen fueling stations to support these vehicles. Currently, infrastructure for FCVs exists primarily in the Bay Area and Los Angeles regions; however, the Sacramento region has recently added two new hydrogen fueling stations, for a total of three available stations in the area.

Currently, the only light-duty FCV available for sale is the Toyota Mirai, which is a midsize sedan. Specific applications for FCVs are similar to PHEVs; however, the regions in which the vehicles are operated must be outfitted with proper hydrogen fueling infrastructure.

Vehicles over specified mileage and age thresholds are eligible for replacement. Currently ZEVs are available on statewide commodity contracts in the subcompact, compact, midsize sedan, small SUV, medium SUV, light-duty pickup, and minivan vehicle classes. There are currently 95 vehicles in our fleet that are eligible for replacement in vehicle classes for which ZEVs are available. Table 2.2 below shows DGS fleet vehicles currently eligible for replacement.

Table 2.2: Light Duty Vehicles in Department Fleet Currently Eligible for Replacement

	Sedans	Minivans	Pickups	SUVs, 5 passengers	SUVs, 7 passengers	Total
# of vehicles eligible for replacement	95	48	42	2	4	191

The table below shows the estimated number of ZEVs that have been or are anticipated to be added to the department fleet in coming years.

Table 2.3: ZEV Additions to the Department Fleet

	21/22	22/23	23/24	24/25	25/26
Battery Electric Vehicle	62	110	123	44	51
Plug-in Hybrid Vehicle	59	50	97	149	147
Fuel Cell Vehicle	0	0	0	0	0
Percent of total purchases	25	32	44	39	40
Required ZEV Percentage	35%	40%	45%	50%	50%
Total number of ZEVs in Fleet*	511	632	792	1,012	1,205

Medium- Heavy-Duty ZEV Adoption

Similar to the light-duty purchasing policy above, the adoption of MD/HD ZEVs is essential to meet greenhouse gas emission reduction goals. As of July 2020, SAM section 4121.9 requires state agencies to prioritize the purchasing of MD and HD ZEVs vehicles into their fleets. Additionally, beginning December 31st, 2025, departments are required, per Assembly Bill (AB) 739, to have 15% of newly purchased vehicles with a gross weight rating of 19,000 pounds or more be ZEVs. This percentage will increase to 30% by December 31st, 2030.

DGS heavy-duty vehicles are primarily used by FMD and RESD. These vehicles are used by maintenance and construction teams to haul equipment and tools to and from DGS-owned and managed sites. FMD and RESD operations necessitate vehicles with large cargo and hauling capacity so many vehicles used for these divisions are pickup trucks and cargo vans.

Many of these vehicles have the potential to be replaced by ZEVs with minimal operational challenges. Vehicles that will be identified to be replaced with ZEVs include vehicles that run on consistent schedules and return to the same location everyday such as building maintenance, groundskeepers and inter-office mail delivery services. Most DGS vehicles that work in the field include cargo vans and trucks that carry heavy tools and equipment. These vehicles are possible candidates for ZEV replacements should payload capacity meet the operational needs of each operator.

Vehicles over meet specified mileage and age thresholds are eligible for replacement. Currently ZEVs are available on statewide commodity contracts are Class 2B, Class, 3, Class 4, Class 5, Class 6 and Class 8.

Table 2.4: MD/HD Vehicles in Department Fleet Currently Eligible for Replacement

	Vans, Class 2b	Vans, Class 3 & 4	Vans, Class 5 & 6	Trucks, Class 3-6	Trucks, Class 8	Total
# of vehicles eligible for replacement	16	0	0	0	0	16

ZEV Take-home Vehicles

Vehicles that are authorized for home storage, per SAM Section 4109, are subject to all applicable ZEV purchasing policies.

DGS has several ZEV take-home vehicles in its fleet. All DGS vehicles have already been equipped with telematics devices that can provide real time charging and utilization data. This data can be used to identify opportunities for future ZEV adoption, ensuring current ZEVs are being charged appropriately and that certain types of ZEVs meet the operational needs of DGS employees.

Telematics Plan

Telematics is a method for monitoring vehicle use. Using GPS and onboard diagnostics, telematics provides valuable information that often results in fuel savings and improved vehicle utilization. Telematics is especially important for verifying that plug-in hybrid vehicles are maximizing the use of electric fuel rather than gasoline. The requirement that 50% of ZEVs purchased must be BEVs is not in place for fleets making use of telematics for all ZEVs. To better capture real-time usage data and to alleviate the workload associated with vehicle usage reporting, DGS intends to install telematics on all its fleet assets. By installing telematics on all vehicles, DGS will be able to conduct real-time utilization analyses and adjust usage accordingly to ensure maximum efficiency of our fleet assets. In addition, telematics will allow DGS to ensure that ZEVs are being charged/fueled appropriately and, if not, to take corrective measures. DGS has issued a new telematics policy that requires all state departments to have telematics technology installed in their fleet assets. We anticipate that the recent implementation of this telematics policy will substantially reduce gasoline consumption for state-owned, non-public safety internal combustion engine vehicles.

Public Safety Exemption

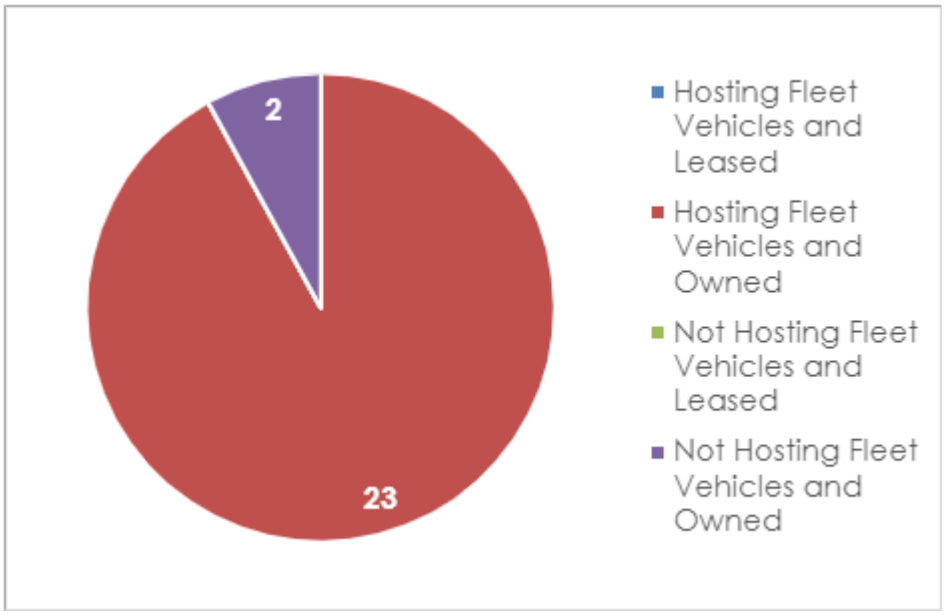
DGS does not employ sworn police officers or emergency responders; therefore, the department does not qualify for the Public Safety Special Performance exemption.

Department of General Services Parking Facilities

The OFAM Parking Administration Unit provides general oversight of 25 DGS owned motor vehicle parking facilities statewide. Parking facilities include surface lots, stand-alone garages, and garages housed within a DGS office building. Approximately 56% of parking facilities are stand-alone, and 44% are housed within a DGS office building. All DGS parking facilities can host fleet vehicles. Currently, 23 parking facilities (92%) host fleet vehicles. Generally, parking stalls are available on a first come, first served basis. At select facilities there is a limited number of parking stalls reserved for the tenant agency, CHP, electric vehicles, tall vehicles, fleet vehicles, tandem parking, or visitor parking.

Monthly parking for state employees and fleet vehicles is offered at all 25 parking facilities. Daily parking for the public offered at 7 parking facilities. To alleviate pandemic related economic burdens, OFAM authorized a discounted daily parking rate of $8.00 per day for state employees. Currently, there are no plans to discontinue the discounted daily parking rate.

Graph 2.5: Parking Facilities



Given the nature of the department's fleet operations, the length of stay for employees, and length of stay for visitors, DGS determined that Level 1 (L1) chargers shall make up approximately 25% of chargers in employee parking areas and 25% of chargers in fleet parking areas, with the remainder being Level 2 (L2). DGS recommends 75% of chargers for employees be L2 and that 75% of fleet chargers shall be L2.

Based on estimates of future ZEV fleet purchases and a count of workplace parking spaces, it has been determined that the Department will need an additional (52) L1 and (68) L2 chargers installed in the 25 DGS owned motor vehicle parking facilities to

adequately serve fleet vehicles and achieve the goals established in the ZEV Action Plan.

The facilities with the most urgent need for EV charging are listed below.

Table 2.5: High Priority EVSE Projects

Facility Name	Total Parking Spaces	Exist L1 Charging Ports (2020)	Exist L2 Charging Ports (2020)	Existing L3 Charging Ports (2020)	Total Charging Ports (2020)	Additional EV Charging Ports Needed by 2025
DGS OFAM Lot 55 Sacramento	532	28	5	0	33	10 Level 2 ports
DGS OFM Lot 6 Sacramento	400	24 outlets	8	0	32	13 Level 2 ports
DGS OFAM Lot 14 Sacramento	720	40 outlets	8	0	48	9 Level 2 ports
DGS OFAM Lot 7 Natural Resources Building Sacramento	54	40 outlets	4	0	44	52 Level 1 ports
DGS OFAM Lot 43 East End Complex (052) Sacramento	157	11 outlets	4	0	15	14 Level 2 ports
DGS OFAM Lot 43 East End Complex (53P-Parking Structure) Sacramento	614	21 outlets	5	0	26	16 Level 2 ports
DGS OFAM Lot 24 Bonderson Garage Sacramento	577	30 outlets	4	0	34	6 Level 2 ports
Total	**1348**	**194**	**13**	**0**	**75**	**L1: 52 L2: 68 Total: 120**

Outside Funding Sources for EV Infrastructure

The DGS Office of Sustainability (OS) Transportation Unit, in coordination with DGS Office of Facilities and Asset Management (OFAM), have been very engaged and pursued several utility charger rebate programs. Three DGS EVSE projects completed in 2019-2020 in Marysville, Fresno and Red Bluff resulted in $69,575 rebates from PG&E. (This incentive program was discontinued but PG&E is working on launching a new level 2 charger rebate program in 2022.)

The OS Transportation Unit has also been actively pursuing other EV charger rebates for DGS EVSE projects through both the California Energy Commission-funded CAleVIP program and the Sacramento Municipal Utility District (SMUD). There is currently $305,000 in charger rebates reserved through these programs for 2020-2023 DGS EVSE projects, which will be paid out when the projects are completed. The rebate incentive funding received by the OS Transportation Unit is kept in a separate account and reinvested back into future EVSE projects at DGS owned facilities.

Hydrogen Fueling Infrastructure

DGS has six hydrogen fuel cell vehicles (FCVs) in the leased fleet. These vehicles fuel up at public hydrogen fueling stations in the Sacramento region located below:

- 1515 South River Road, West Sacramento, CA 95691
- 3510 Fair Oaks Boulevard, Sacramento, CA 95864
- 6141 Greenback Lane, Citrus Heights, CA 95621

As more hydrogen fueling stations come online, there may be additional opportunities within the Sacramento region to deploy FCVs. Outside of the Sacramento region, there may be opportunities to deploy more FCVs at DGS facilities in the Bay Area and Los Angeles regions, where there is a high concentration of commercial hydrogen fuel stations.

There are currently no plans to install any hydrogen fueling stations at DGS facilities, however, the OS Transportation Unit is following this technology closely and will continue to monitor the need for such fueling.

Comprehensive Facility Site and Infrastructure Assessments

Site Assessments, or feasibility studies, are performed to establish the cost and feasibility of installing needed EV charging infrastructure at individual state- owned facilities. The table below lists the assessments completed by the OS Transpiration Unit's architectural and engineering firms at DGS facilities between 2019-2020.

Table 2.6: Results of Site Assessments 2019-2020

Facility Name	L1 Chargers w/Current Electrical System	L2 Chargers w/Current Electrical System	Total cost for Project using Current Electrical System	L1 Chargers w/Electrical System Upgrades	L2 Chargers w/Electrical System Upgrades
DGS Elihu Harris Building Oakland	Unknown				
DGS DOJ Broadway, Sac	n/a	13	$474,547	n/a	n/a
DGS 450 N Street, Sacramento	6	n/a	$31,939	n/a	n/a
DGS 1300 I Street AG Building, Sac	n/a	39	$433,845	n/a	n/a
DGS 1500 10th St., Bonderson Garage, Sacramento	n/a	6	$67,516	n/a	n/a
DGS 1214 17th St. East End Garage Complex, Sac	n/a	16	$238,995	n/a	n/a
DGS East End 1500 Capitol Ave., Sac	n/a	14	$211,929	n/a	n/a
Total		**88**	**$1,458,225**		

EVSE Construction Plan

DGS OFAM and DGS OS Transportation Unit are coordinating the installation of new EVSE at DGS buildings to support the state ZEV fleet and workplace charging for state employees. Regular monthly meetings are held to discuss and review the EVSE Construction Plan and monitor progress.

Five EVSE projects were completed by the OS Transportation Unit in 2019 at DGS owned buildings. These include the DGS Santa Rosa State Office Building (2 Level 2 charging ports), DGS Water Resources Building in Fresno (6 Level 1 charging ports), DGS Redding State Office Building (4 Level 2 charging ports), DGS Stockton Office Building (4 Level 2 charging ports) and the DGS Hugh Burns State Office Building in Fresno (6 Level 2 charging ports).

Four EVSE projects were completed by the OS Transportation Unit in 2020 at DGS owned buildings. These include: the Leo J. Trombatore Building in Marysville (16 L2 charging ports), DGS Red Bluff State Office Building (23 Level 2 charging ports), DGS CalTrans District 11 Headquarters in San Diego (6 Level 3 charging ports) and a phase II project at the DGS Hugh Burns State Office Building in Fresno (33 Level 2 charging ports). In

addition, 28 Level 1 outlets were replaced with Level 1 charging ports at DGS Lot 55 800 Q St. In Sacramento.

Three EVSE projects were initiated in 2020 by the OS Transportation Unit in 2020 at DGS owned buildings. These include: DGS East End Complex (28 level 2 charging ports), DGS Bonderson Garage (6 level 2 charging ports) and the DGS CDTFA building (6 level 2 charging ports). These projects will be completed by June 2022. Additional EVSE projects will be added in 2021. The DGS OS Transportation unit is performing the work on these projects from start to finish.

Electric Vehicle Supply Equipment (EVSE) Operation

Currently, OFAM manages 265 networked EVSE across 33 locations via the network provider EV Connect. EV Connect passed a DGS privacy threshold assessment in 2020 (https://www.evconnect.com/legal/#CA-GCS-Notice). The EV Connect admin portal allows DGS to gather data on EVSE utilization levels, energy used, charging time, revenue, electric miles provided, greenhouse gas emissions prevented, and historical session details.

OFAM is the central reporting entity for datasets. In addition to the networked EVSE, there are 683 parking stalls which provide non-networked free EV charging. Non-networked EV charging infrastructure includes 672 L1 and 11 L2 EVSE. Non-networked EV charging infrastructure is metered to collect energy usage data. Data is shared with oversite agencies including the EPA, LAO, California Air Resources Board, and ad hoc with various stakeholders.

To maintain EVSE functionality, EV Connect proactively monitors uptime and identifies EVSE faults using artificial intelligence-based ticketing system. Support tickets may be opened as a direct result of driver feedback and are monitored by OFAM.

Networked EVSE under the purview of DGS OFAM follow pricing rules outlined in the DGS ZEV Parking Policy. L2 and L3 charging rates are $0.17/kWh, plus a $1.15/hour idle fee (vehicle is plugged in but not actively charging) starting 4 hours after the charging session is complete. There is no cost to plug-in to L1 charging. Cost recovery is accomplished through the collection of EV charging fees and sale of clean energy credits. By design, a nominal charging fee encourages vehicle turnover at EV charging stalls. The optics of readily available EVSE charging stalls helps foster the adoption of electric vehicles by commuters who may not have access to residential charging options.

CHAPTER 3 – ENERGY

ENERGY REPORT: DGS Mission and Built Infrastructure

- DGS serves the state as its business manager. DGS' mission is: "Deliver results by providing timely, cost-effective services and products that support our customers, while protecting the interests of the state of California."
- DGS manages many of the largest state-owned buildings, including the State Capitol, totaling 18,376,371 sq. ft. DGS' main energy-consuming facilities include:
- Forty-nine office buildings totaling 16,465,153 sq. ft.
- Five parking facilities totaling 960,315 sq. ft.
- Three nonrefrigerated warehouses totaling 148,192 sq. ft.
- Two central plants totaling 114,455 sq. ft.
- One childcare center (Attorney General office building) totaling 4,893 sq. ft.

Table 3.1 below shows total purchased energy quantities of all DGS facilities for 2020, compared with the 2003 baseline year. It does not include steam and chilled water generated and distributed from Sacramento's Central Plant, as the plant's natural gas and energy use (that generates the steam and chilled water for many Sacramento buildings) is already included in the figures below.

Table 3.1: Total Purchased Energy 2020

Purchased Energy	2003 Baseline Quantity		2020 Quantity		% Qty. Change
Electricity	179,856,224	kWh	171,958,700	kWh	-4%
Less EV Charging	-	kWh	(230,670)	kWh	
Natural Gas	5,877,559	therms	3,780,814	therms	-36%
Propane	-	gallons	-	gallons	
Fuel Oil	-	gallons	-	gallons	
Steam	9,995,688	pounds	12,177,000	pounds	22%
Chilled H2O	499	kBtu	1,740,000	kBtu	348597%
TOTALS	**1,293,719,35**	**kBtu Site**	**978,421,519**	**kBtu Site**	**-24%**

**kBtu = kilo-British thermal unit*

Table 3.2 below lists the 10 highest energy-consuming DGS-owned facilities and one leased facility.

Table 3.2: Properties with Largest Energy Consumption

Building Name	Floor Area (ft^2)	Site Energy (kBTU)	Source Energy (kBTU)	Source EUI ($kBTU/ft^2$-yr)
095 Central Plant*	78,486	270,795,801	378,974,387	4829
084 Franchise Tax Board Complex Buildings	1,931,843	105,479,437	303,876,199	157
051 thru 054 East End Complex	1,708,520	67,132,214	173,204,207	161
018 Resources Building	658,544	49,858,295	144,366,948	219
402 San Francisco Civic Center Building	1,081,890	51,672,593	143,228,292	136
001 State Capitol Building	523,950	50,563,442	124,732,250	259
036 Secretary of State Building (State Archives - Site 7)	530,849	47,375,129	118,111,634	257
028 Board of Equalization Building (Office Building 28)	868,131	40,623,957	110,847,229	172
509 Ronald Reagan State Building	944,187	42,726,705	107,548,187	137
017 State Printing Plant	479,737	53,796,593	102,603,204	214
Ziggurat (Leased)	872,840	21,920,982	61,729,442	157
Total for Buildings in this Table	**9,678,977**	**801,945,148**	**1,769,221,979**	**---**
Total for all Department Buildings	**16,881,595**	**2,618,288,056**	**2,629,890,020**	**---**
Percent of Totals	**57%**	**31%**	**67%**	**---**

*Central Plant energy use includes process loads that generate steam and chilled water for 16 Sacramento buildings.

** Some state buildings in the Sacramento Central Plant loop use steam and chilled water generated at the Central Plant. While this district energy is included in individual building energy use calculations, the data is excluded from department totals to avoid double counting energy use that generates steam and chilled water.

DGS surpassed their grid-based energy reduction target by achieving a 24 percent reduction for 2020, compared with the 2003 baseline, exceeding the 2020 target of 20% reduction from EO B-18-12. During this same time period, DGS Energy Use Intensity (EUI) was reduced 40% since 2003.

DGS continues to work to reduce grid-based energy purchases through a combination of energy efficiency projects at DGS facilities, as well as onsite renewable energy generation. However, DGS has significant new building projects in design or under construction that will increase building area and increase total energy use in the coming few years. Each of these new projects will be ultra-low energy use and ZNE facilities.

- The Department of General Services' Five-year Capital Improvement Program includes the following proposed projects:
    - New Natural Resources Headquarters Building
    - 775,000 NSF office building completed in July 2021. Project designed and built to be very energy efficient and to achieve LEED Platinum and zero net energy.
    - Clifford L. Allenby Building
    - 255,000 NSF office building completed in 2021. Project designed to be very energy efficient and achieve LEED Platinum and zero net energy.
    - 10th & O Street Office Building
    - 472,000 square foot office building completed October 2021. Project designed and built to ultra-energy efficient targets as well as to achieve zero net energy and zero net carbon.
    - New Richards Blvd. Office Campus
        - On site of previous, demolished old printing plant, DGS is designing and building a new office complex with four buildings totaling approximately 1,250,000 square feet on the 17.3-acre site.
        - Project is being designed to be very efficient, zero net energy and zero net carbon, with a tentative building occupancy scheduled for May 2024.
    - Renovation of the Bateson Building
        - This project will renovate the historically significant Gregory Bateson Building located at 1600 Ninth Street in Sacramento. The Bateson Building contains approximately 215,000 net usable square feet primarily designed for general office use. The project is being designed to be very energy efficient, zero net energy and zero net carbon upon completion in 2024.
    - Renovate the Jesse Unruh Building
        - This project will renovate and restore the Jesse Unruh Building located at 915 Capitol Mall in Sacramento. This historically significant building constructed in 1929 contains approximately 125,000 net square feet of office space. The renovated space is being designed to be very energy efficient, zero net energy and zero net carbon when completed in January 2025.
    - Renovate the Vacated Resources Building
        - This project will renovate and restore the original Resources Building located at 1416 Ninth Street in Sacramento. This historically significant building constructed in 1964 contains approximately 658,544 gross sq. ft. of building area. The renovated space is being designed to be very energy efficient, zero net energy and zero net carbon when completed in April 2025.

Zero Net Energy (ZNE)

- In 2021, DGS completed three large office building projects that will be ZNE. The 12th & O Street, Clifford L. Allenby, and Resources Agency buildings, as well as the Richards Blvd. building project (under construction) will be ultra-efficient, high-rise to mid-rise office buildings in downtown Sacramento, with site EUIs of 25-30 kBtu/square foot. Due to site, building, and grid restrictions, DGS is planning to utilize long-term community renewable generation from a SMUD SolarShares agreement to include the first three of these projects in the DGS ZNE portfolio. DGS is seeking additional long-term renewable energy resources to offset the 4th building once completed.
- By the end of 2020, 29 DGS buildings were part of the DGS ZNE Portfolio (about 42% of total DGS building area). This is described in more detail below.
- DGS created the policies that required ZNE for state buildings, and developed tools, resources and training for all state agencies.
- DGS led the development of Executive Order B-18-12, which requires ZNE for new and existing state buildings.
- DGS developed and issued Management Memo (MM) 17-04, which requires all new projects beginning design after October 2017 to be ZNE. In addition, DGS developed tools, resources and training for use by all state agencies and made these materials all available on an open website: Zero-Net-Energy materials
- All new projects beginning design going forward should be designed to be ZNE following cost-effective energy efficiency strategies. New projects designed and constructed by DGS for the Department of Motor Vehicles and the Air Resources Board will be ZNE following cost-effective energy efficiency strategies.
- DGS analyzed its existing building portfolio and determined that by the end of 2021, over 50% of its targeted building portfolio area will meet energy efficiency targets for ZNE buildings established in MM 17-04 and combined with onsite and offsite renewable energy qualify as part of the DGS ZNE portfolio. This should result in DGS meeting the 2025 target (50 percent of total building area) four years early.
- DGS installed 3 MW of onsite renewable energy generation at the Franchise Tax Board facility in 2017, and 0.8 MW at the Caltrans District 3 Headquarters building in 2018. At the Department of Justice Building, 2.3 MW of renewables were installed in 2019 and were activated in early 2020.
- Additionally, DGS entered into a 5 MW SolarShares agreement with SMUD with a 20-year offsite renewable energy contract in 2016, and an additional contract with SMUD for approximately 34 MW more that began January 1, 2018. These offsite community solar agreements will yield long- term savings to DGS over 20 years. DGS is currently working with SMUD to add more renewable energy to its portfolio.

- Combined, these sources will provide more than 50 percent of DGS' Sacramento portfolio energy from community solar, providing the renewable component for a sizeable portion of DGS energy-efficient buildings to be classified as part of the DGS ZNE Portfolio.
- DGS has six existing buildings in design or construction, to undergo major renovations by 2025, that will meet zero net energy efficiency targets, that will increase the DGS ZNE portfolio another 4 percent once additional clean renewable energy can be obtained.
- The Joe Serna Building (CalEPA) will be added to the DGS portfolio in 2023. This efficient building will qualify to be part of the DGS ZNE portfolio once long-term renewable energy can be added from DGS renewable energy contracts and would then increase the DGS ZNE portfolio 4 percent more.
- DGS has energy efficiency and Energy Services Companies (ESCO) projects underway to further reduce energy use at many DGS facilities. These projects are expected to qualify 3 more buildings (9 percent) for ZNE by 2025.
- DGS is evaluating measures to improve the efficiency of more of its existing building portfolio, to further exceed the 50% threshold ahead of the 2025 deadline.
- Table 3.3 below shows a summary of ZNE buildings in DGS' portfolio or in design in 2020, as well as others planned to be ZNE by 2025. (See Workbook Tab 3.3 & "ZNE Worksheet" for details)

Table 3.3: Zero Net Energy Buildings

Status of ZNE Buildings	Number of Buildings	Floor Area (ft^2)	% of Building Area
Buildings Completed and Verified	29	7,822,496	42%
Building in Design or Under Construction	4	3,456,807	16%
Building Proposed for Before 2025 (but not yet in design)	7	1,773,073	8%
Addtl. Exist. Bldg. Area within 15% of ZNE target EUI and have EE projects planned	3	1,888,351	9%
Totals for ZNE Buildings by 2025	43	14,940,727	68%
Totals for All Department Buildings by 2025	69	21,876,521	
% ZNE by 2025	62%	68%	

New Construction Exceeds Title 24 by 15%

DGS-owned and major renovations designed since July 1, 2012:

- In the last few years DGS recently began constructing several new buildings for its own portfolio, the first new buildings since the early 2000s. The first recent major renovation was to the Stanley Mosk Library and Courts building at 914 Capitol Mall in Sacramento in 2013. This project was designed and bid prior to the 2012 mandate, but under EO S-20-04, it achieved a LEED Silver Certification, and exceeds Title 24 by 15%.
- During 2021, DGS completed three new office buildings on O and P Streets in Sacramento. The combined square footage for these buildings is 1.7 million sq. ft. All three projects were designed to exceed Title 24 by more than 15% and to achieve ZNE.
- All buildings listed for new construction or major renovations in the DGS Five-year Capital Improvement Plan noted earlier will be designed to exceed Title 24 by more than 15 percent with a goal of becoming ZNE certified and LEED Silver certified or higher.

Table 3.4 below shows new DGS buildings completed since July 2012, or currently under design. All have exceeded or plan to exceed Title 24 by 15% or more.

Table 3.4: New Construction Exceeding Title 24 by 15% through 2020

Buildings Exceeding Title 24 by 15%	Number of Buildings	Floor Area (ft^2)
Completed Since July 2012	0	0
Under Design or Construction in 2020	5	3,456,807
Proposed Before 2025	0	0

DGS is committed to designing all of its projects to exceed Title 24 by 15% at minimum and to go beyond that benchmark with the department's goal to make all new construction meet ZNE standards. Committing to ZNE design for buildings challenges the entire design and construction team on each project to make energy efficiency in the building one of the highest priority criteria in the project's completion. This ZNE goal then becomes the best insurance that new buildings for DGS meet the EO B-18-12 mandate for exceeding Title 24 by 15%. The newest building projects are being designed to be all-electric, eliminating reliance on natural gas, and enabling them to achieve zero net carbon operations once long-term clean renewable energy can be obtained.

Reduce Grid-Based Energy Purchased by 20% by 2018

Executive Order B-18-12 required state agencies to reduce grid-based energy purchased by 20% by 2018, compared with a 2003 baseline. Through the end of 2020,

DGS reduced its total grid-based energy purchases by 24 percent, even with DGS' portfolio total building area growing 9 percent during the same time period.

Energy Efficiency in Data Centers and Server Rooms

All state-owned and leased data centers and server rooms greater than 200 square feet must be operated within the American Society of Heating, Refrigerating and Air-Conditioning Engineers'(ASHRAE) Technical Committee 9.9, Class A1-A4 guidelines, including operating at temperatures between 73-81 degrees Fahrenheit.

DGS HQ: Server Room, 707 3rd Street, West Sacramento

- Server room approximate size: 944 square feet
- As of July 15, 2022, the average server inlet temperature is 64 degrees.
- Action item: By October 2022, must raise the temperature a minimum of 9 degrees to 73 degrees.
- ETS is verifying with cooling vendor if it's possible to increase the in-row cooling units to the Class A1-A4 guidelines
- Expected response from vendor by 8/1/2022
- Owner: DGS Enterprise Technology Solutions. Point of contact: Ben.Gomez@dgs.ca.gov

Office of State Publishing (OSP) Server Room, 855 Riverside Parkway, West Sacramento

- Server room approximate size: 538 sq. ft.
- As of July 15, 2022, the average server inlet temperature is 64 degrees.
- Action item: By October 2022, must raise the temperature a minimum 8 degrees to reach 73 degrees.
- Owner: OSP. Temperature change through building manager. OSP Point of contact: Jerry.Hill@dgs.ca.gov

Office of State Publishing (OSP) Server Room, 855 Riverside Parkway, West Sacramento

- Server room approximate size: 538 sq. ft.
- As of July 15, 2022, the average server inlet temperature is 64 degrees
- Action item: By October 2022, must raise the temperature a minimum 9 degrees to reach 73 degrees
    - ETS is verifying with cooling vendor if it's possible to increase the in-row cooling units to the Class A1-A4 guidelines
    - Expected response from vendor by 8/1/2022
- Owner: OSP. Temperature change through building manager. OSP Point of contact: Russell.Syracuse@dgs.ca.gov

OSP Server Room, 1050 Richards Blvd.

- Server room approximate size: 624 sq. ft.
- As of July 15, 2022, the server room temperature is 73 degrees.
- Action item: No action necessary.
- ETS is verifying with cooling vendor if it's possible to increase the in-row cooling units to the Class A1-A4 guidelines
- Expected response from vendor by 8/1/2022
- Owner: OSP. Temperature change through building manager. OSP Point of contact: Russell.Syracuse@dgs.ca.gov

All state-owned data centers over 1,000 square feet must report their power usage effectiveness (P U E) to the Department of Technology each year.

- No DGS server room is more than 1,000 square feet.

All purchases of network switches and routers meet the Energy Efficient Ethernet Institute of Electrical and Electronics Engineers (IEE E) 802.3-2012 Section 6 standard.

- All DGS procurements of network switches and routers meet the IEE E 802.3-2012 Section 6 standard.

Virtualization options must be considered when refreshing server equipment or standing up new systems.

- DGS migrated all physical servers at its primary server room at 707 3rd Street to virtual VMware guest servers by 2015. All new and refreshed DGS applications are evaluated for deployment in a public cloud environment. DGS applications not capable of migrating to a public cloud are implemented at DGS as virtual guests on the VMware ESXi platform.

Energy Best Management Practices

- Management Memo 14-07 "Standard Operating Procedures for Energy Management in State Buildings" and the associated Standard Operating Procedures:
- Ensuring all lights and equipment are turned off at the end of each workday.
- All computers, copiers and printers are set to utilize their Energy Saver mode during periods of inactivity.
- Energy Star rated equipment is purchased whenever practical.
- Lighting and HVAC electric usage is minimized outside of normal building hours.
- Building HVAC controls are set to allow for a +2 or -2 degree fluctuation from the temperature set point.

- Ensure that buildings take advantage of cool nighttime and morning temperatures by effectively utilizing economizer and night flush cycles.
- Ensure that data centers are operated at the maximum temperature allowed by equipment manufacturers.
- Ensure that domestic hot water systems are not set hotter than 105 degrees.
- Ensure that HVAC ducts, filters and equipment are inspected and maintained at maximum effectiveness.
- Ensure that all boilers are tuned up, including a combustion efficiency check, at least twice per year.
- Ensuring that lights are turned off in all unoccupied rooms.
- Install daylight controls on electric lights in any space over 10,000 ft2 that has skylights or windows.
- Ensure that state employees not plug in any personal devices other than cell phone and Tablet chargers and task lights, and that any personal space heaters, microwaves, refrigerators and coffee makers are removed from the workplace.
- Ensure that employees are not using personal heaters without written permission. Provide a link to any department policy that disallows personal heaters and other personal devices or describe how your department implements this requirement.
- Ensure that any new equipment purchased for employee kitchens and break rooms has an Energy Star rating. Strive to replace refrigerators manufactured prior to the year 2000 with more efficient models.
- Ensure that all vending machines on-site are certified to Energy Star version 3.0, section 3(B) or are equipped with after-market occupancy sensor or sales-based energy management hardware.
- Ensure that all coffee makers shut off automatically.
- Ensure that kitchen, break room, and lunchroom equipment is cleaned regularly and maintained to optimize efficiency.
- Ensure that timers are installed on all equipment including paper shredders, lighted snack vending machines, and water coolers, so the equipment will be turned off automatically during non-working hours.
- Establish an annual email from Department directors to educate all employees on the importance of minimizing electrical plug loads.

DGS buildings managed by the Facilities Management Division (FMD) vary in age, size, operational hours, and features, and occupancy levels have dropped as of March 2020 as occupants telework as coronavirus prevention measure. Some buildings lack effective energy management systems and/or occupancy sensors and building managers must make manual adjustments to save energy. Building managers remind staff and tenants of their responsibility to turn off lights and save electricity. Building managers also check to ensure lights are off before leaving buildings at the end of the

workday when they are the last person to leave the building. DGS leadership is exploring the costs and benefits of updating building management systems so all buildings can benefit from an effective automated energy management system.

FMD building managers have monthly meetings with tenants and weekly meetings with staff where energy management practices are discussed, including office shutdown procedures like turning off the lights and appliances, closing the blinds when hot and opening them to allow the sun's heat in when cold. In addition to monthly meetings with tenants, FMD is creating quarterly reports with monthly energy and water use trends for tenants that also include information on sustainability initiatives and policies. DGS building managers refer to Management Memo 14-07 policy when reminding staff and tenants to purchase Energy Star equipment whenever practical. DGS procurement contracts always include requirements for Energy Star-rated equipment, unless such ratings are not available for some types of equipment, or if such requirements would limit the competition to a sole source vendor.

Since the summer of 2018, FMD buildings participate in a "Summer Save Electricity" competition in which the winning building demonstrates the strongest electricity use reduction compared to the previous summer. Energy Star Portfolio Manager energy data is utilized to calculate the energy change from the prior summer. During the competition period, FMD's headquarters sends messages with energy-saving tips to all DGS building staff, and this information is then shared with tenants. FMD headquarters also shares tips on steps to take during peak energy event days. After a winner is calculated, the building managers from the winning buildings share their teams' energy-saving steps toward success in the FMD quarterly newsletter shared with all FMD staff. FMD provides an ice cream celebration to the winning FMD building team and to tenant representatives. FMD plans to continue these energy-saving competitions each summer.

In many FMD buildings, the tenants own appliances such as the vending machines, coffee makers, refrigerators and water coolers. FMD has not taken a formal survey to determine if the refrigerators in use were manufactured prior to 2000, but based on discussions with several building managers, the percentage is very low, if there are any at all. Similarly, FMD has not taken a survey of vending machines in its buildings to determine which vending machines are Energy Star certified. FMD building managers and custodial supervisors ensure that kitchens and break rooms are cleaned regularly and maintained to optimize efficiency. DGS has not taken a formal survey of shredders, vending machines or water coolers to determine automatic shutoff during non-working hours. DGS does not currently have a plan to install timers on water coolers but can explore that option with energy-saving projects through ESCOs. The State Administrative Manual 1805.3 states: "State employees are prohibited from using personal heaters without the express written consent of the facility manager or an approved reasonable accommodation request." Building managers work with tenants to enforce this policy, including requiring notes from doctors explaining the reason for accommodating a request for a personal heater.

All building managers work with tenants and staff to follow MM 14-07's standard operating procedures. Some buildings have tenants that require areas of the buildings to be open 24 hours a day and seven days a week. For those buildings that are open 6a.m. though 6 p.m. Monday through Friday, tenants submit a request to the building manager a week in advance if the tenant needs to use heating, ventilation, and air conditioning (HVAC) system and lighting outside of those hours. For buildings without an effective energy management system, building managers or engineers manually turn off and on HVAC, lighting, etc.

In DGS buildings with effective energy management systems, building managers or engineers set the dead band for a plus or minus 2-degree fluctuation from the temperature set point. Engineering staff perform ongoing preventive maintenance to make sure the process is working. DGS utilizes preventive maintenance software to create reminders in the form of work tickets for the actions needed.

In all buildings with effective energy management systems, cool nighttime and morning temperatures are maximized by effectively utilizing economizer and night flush cycles. The energy management system is also programmed for it. In buildings that lack effective energy management systems, building managers or engineers manually adjust fresh air dampers. Buildings use night flush cycles whenever it is beneficial for reducing energy usage.

Buildings with effective management systems have a setting for ensuring domestic hot water systems are not set hotter than 105 degrees, and engineers test this per preventive maintenance schedule. For buildings that do not have effective management systems, building managers or engineers set water heater thermostats manually and then use thermometer gauges to verify temperature. Engineers with calibration tools and gauges manually verify the temperature.

DGS leadership is currently reviewing potential projects such as LED retrofits and energy management system upgrades in DGS buildings. There is no current plan to measure light levels in all DGS facilities. DGS is investigating the feasibility of adding more occupancy sensors through ESCO(s). Some older DGS buildings have magnetic ballasts and some have T8 ballasts, and DGS leadership is looking into lighting upgrades at its facilities through ESCO energy-efficient retrofit projects as well as lighting-only projects.

Buildings with effective energy management systems are able to monitor daylight controls. In buildings that do not have effective management systems, building managers and engineers manually adjust for energy efficiency. DGS has not surveyed its buildings to identify spaces near windows that do not have lighting controls, but is planning to explore numerous lighting energy efficiency options utilizing ESCO(s).

All buildings use a preventive maintenance software system that generates work orders based on the timing intervals programmed for HVAC maintenance. They are programmed according to relevant requirements for the building, and they are programmed to comply with the local air district's requirements. The preventive

maintenance software also generates work orders for all of the building's major assets, including boilers and chillers.

Buildings with ineffective energy management systems present significant challenges. These systems are usually dated or broken. DGS is exploring options for energy management system upgrades to improve efficiency benefits in DGS buildings.

Progress towards EO B-18-12's grid-based energy purchase 20% reduction targets relative to a 2003 baseline year include the following:

- DGS' building portfolio increased by 9% between 2003-2020 yet has decreased its total energy use by 24% during this same period, reducing its departmentwide Site EUI by 40%.
- Forty-two percent of the DGS building area already meets or exceeds the ZNE efficiency EUI targets, and another 24% planned to meet these targets by 2025 through a combination of new construction, major renovations, and energy efficiency projects planned or underway.
- DGS facilities used approximately 4 percent less electricity in 2020 compared with 2003 and decreased its use of natural gas by 36% since 2003, combining to reduce overall energy use by 24%. Electricity is still the predominant form of energy used at DGS facilities.
- DGS is moving toward electrifying and decarbonizing its facilities, and new projects in design, construction or major renovation are working to eliminate dependance on fossil fuel energy sources.

Table 3.5 below illustrates comparisons for energy consumption as well as building area and energy use intensity (EUI) for DGS buildings between 2003 and 2020.

Table 3.5: Department-Wide Energy Trends

Year	Floor Area (ft^2)	Total Source kBTU Consumption	Department Ave. Source EUI
Baseline Year 2003	16,978,332	2,781,143,020	164
2013	18,515,781	3,400,804,837	184
2014	18,515,781	2,697,516,780	146
2015	18,515,781	2,672,853,580	144
2016	18,515,781	2,556,558,614	138
2017	18,515,781	2,707,700,574	146
2018	18,376,490	2,568,160,577	140
2019	18,561,256	2,464,788,786	133
2020	18,515,781	2,297,222,994	124
% Change 2003-2020	**9%**	**-17%**	**-24%**

Through the end of 2020, DGS reduced its grid energy use through energy efficiency upgrades and renewable energy. Additionally, reduced occupancy due to the COVID pandemic reduced energy from plug loads in most facilities. Beginning 2017, DGS brought online 3 Megawatts (MW) of photovoltaic (PV) electricity at the Franchise Tax Board in 2017, 0.8 MW onsite at Caltrans District 3 in 2018, and 2.3 MW at the Department of Justice Building in 2019. These combine to further reduce grid-based energy needed for the DGS portfolio.

- DGS, through its ESCO program, strives to develop comprehensive energy savings projects at its facilities that result in as much energy savings as possible through retrofits to existing building mechanical systems, lighting controls, lighting upgrades, and building envelope improvements. The goal is to save energy, reduce energy costs, extend equipment life, and decrease operations and maintenance costs at DGS facilities. In addition to DGS-owned facilities, the DGS program is available to develop and implement projects at all state facilities and has projects underway with other state agencies which are captured in their roadmaps.
- DGS has energy savings projects underway at the DGS-owned Ronald Reagan Building in Los Angeles, and the East End Complex in Sacramento, totaling over 2.3 million square feet of office space.
- Due to inconsistent district energy readings and data, it is difficult to compare energy trends year to year. To address this, DGS has created a multi-division effort to determine and correct the underlying data accuracy challenges with its monthly steam and chilled water data from its Sacramento Central Plant (which provides district energy to 75% of the DGS portfolio).

Table 3.6 quantifies energy savings and building area of DGS facilities that have undergone energy efficiency upgrades over the past four years.

Table 3.6: Summary of Energy Projects Completed or In Progress

Year Funded	Estimated Energy Savings (kBTU/yr)	Floor Area Retrofit (sq.ft.)	Percent of Department Floor Area
2015	17,634,089	1,391,028	9%
2016	0	0	N/A
2017	31,928,455	4,651,090	29%
2018	42,011,422	3,431,582	21%
2019	0	0	N/A
2020	7,971,338	142,378	1%
2021	0	0	N/A
Totals	**99,545,304**	**10,247,147**	**59%**

DGS has conducted ASHRAE Level 2 energy surveys in 22% of its buildings over the last few years. Level 2 surveys began at eight sites in 2018, with a focus on cost-effective

projects for the buildings with high energy uses. These surveys and building areas are quantified in Table 3.7.

Table 3.7 quantifies Level 2 energy surveys conducted at DGS facilities since 2015.

Table 3.7: Energy Surveys

Year	Total Department Floor Area (sq. ft.)	Energy Surveys Underway (sq. ft.) Level 1	Energy Surveys Underway (sq. ft.) level 2	Percent of Department Floor Area level 1	Percent of Department Floor Area level 2
2015	18,515,781	0	1,391,028	0	8%
2016	18,515,781	0	0	0	N/A
2017	18,515,781	0	4,651,090	0	25%
2018	18,376,490	0	3,431,582	0	19%
2019	18,561,256	0	0	0	N/A
2020	18,515,781	0	0	0	N/A

Demand Response

Executive Order B-18-12 directed all state Departments are to participate in available demand response programs and to obtain financial incentives for reducing peak electrical loads when called upon, to the maximum extent cost-effective.

- Ten DGS buildings participate in SMUD's Power Direct Automated Demand Response Program. In 2019, SMUD paid DGS $17,895, the maximum available financial incentive for participating in the program. In order to participate, buildings are required to install technology systems that automatically scale back energy use when demand is highest to effectively reduce energy consumption during peak times. SMUD offers financial incentives for installing the automation systems and equipment and offers $3.50/kW per month for a one-year commitment and $5.00/kW per month for a three-year commitment. The 10 DGS buildings all have three-year commitments with SMUD.
- Two DGS facilities located in San Francisco participated in CleanPowerSF's Peak Day Pricing Pilot manual demand response program in 2020 and 2021. For the 2021 season, DGS earned over $3,800 in incentives from the program.
- The main challenge for DGS buildings is lacking the technology required for participating in automated demand response programs. Most building managers reported they participate in the Flex Alert system, where they receive an email issued by the California Independent System Operator (ISO), a nonprofit, public benefit corporation that operates the high voltage grid in California, asking consumers to conserve electricity during heat waves and other challenging grid conditions. Building managers adjust manually in response to the FlexAlert events. To increase participation in automated

demand response programs, DGS continues to work with utility account representatives to determine if the utility offers a cost-effective automated demand response program that will work effectively with the technology available at the building. In addition, DGS continues to seek opportunities to cost-effectively acquire the technology required for automated demand response program participation.

- As of May 2022, PG&E, SDG&E, SCE, and LADWP have manual demand response programs. DGS FMD submitted applications to participate for its 16 buildings located in these utility territories. In addition, SMUD is evaluating applications for additional buildings in Sacramento to participate in its Power Direct Automated Demand Response Program.

Table 3.8: Demand Response

Demand Response Participation	Number of Buildings	Estimated Available Energy Reduction (kW)
Number of DGS Buildings Participating in 2020	12	N/A
Number of DGS Buildings Participating in 2021	12	N/A
Number of DGS Facilities Applying to Participate in Programs in 2022	33	N/A
Total DGS Facilities	55	N/A
Facility Participation in 2021 (Percent)	22%	N/A

Renewable Energy

DGS has been assisting state agencies in procuring onsite renewable energy generation at state facilities for the past 15 years. Through its Clean Renewable Energy program and Power Purchase Agreements (PPA), renewables have been installed at the California Department of Corrections and Rehabilitation (CDCR), Department of State Hospitals, Caltrans, DGS and other facilities. PPAs yield lower energy costs than if energy was purchased directly from the utilities, and there are no capital costs to the agencies participating. Most of these installations have been for CDCR, with large ground-mounted systems, and DGS started utilizing PPAs to add onsite renewable energy generation at DGS facilities beginning in 2017. These further reduced grid energy purchases for DGS facilities and helped DGS exceed its 20% target in 2020.

- DGS onsite renewable energy portfolio consists of the following:
  - In 2017, DGS installed 3 MW of PVs at the Franchise Tax Board facility in Sacramento through a PPA, which is anticipated to generate 5,500,000 kWh annually.

    - In early 2018, DGS installed 0.8 MW at the Caltrans District 3 office building in Marysville through a PPA, which generates approximately 680,000 kWh annually.
    - By November 2019, DGS installed 2.3 MW of PVs at the Department of Justice building in Sacramento through a PPA that is expected to generate approximately 4,700,000 kWh annually.
- DGS manages a renewable energy program that has installed approximately 80 MW at numerous locations for multiple state agencies and should have over 100 MW installed by the end of 2023.
- Much of DGS' existing building portfolio is in the downtown Sacramento grid area, which has grid restrictions limiting onsite renewable generation – especially exporting power – as well as very limited land or parking area for renewables. To address this, in 2016, DGS entered into a SolarShares agreement with SMUD for 5 MW of solar panels constructed at its Rancho Seco site dedicated to providing power to a portion of the DGS Sacramento portfolio. On October 30, 2017, DGS entered into another SolarShares agreement with SMUD for another 34 MW of PVs to be added to provide long-term dedicated renewable energy to the DGS portfolio. The new agreement took effect January 1, 2018, and is valid for 20 years.
- MM 17-04 mandates that all new projects beginning design after October 23, 2017 include either onsite renewable energy generation and/or offsite renewable energy generation.
- DGS has contracted with SMUD in two separate 20-year agreements to procure 39 MW totaling 83 GWh of renewable energy to provide additional renewable energy to DGS facilities.

Table 3.9 shows existing and planned renewable energy for DGS ZNE-targeted facilities through 2020.

Table 3.9: On-Site Renewable Energy

Status	Number of Sites	Capacity (kW)	Estimated Annual Power Generation (kWh)	Percent of Total Annual DGS Power Use
On-Site Renewables in Operation or Construction	3	6,100	10,662,831	5.0%
On-Site Renewables Proposed	0	0	0	0.0%
On-Site Renewables Totals	3	6,100	10,662,831	5.0%
Department-Wide Energy Total	58	N/A	213,738,904	N/A
Off-Site Renewable Totals	2	39,000	83,066,148	38.9%
Off-Site Renewables Planned	0	0	0	0.0%

Off-Site Renewables Combined Current & Planned	0	39,000	83,066,148	38.9%
Current Combined On-Site and Off-Site Renewable Energy	**5**	**45,100**	**93,728,979**	**43.9%**
Additional Planned On-Site and Off-Site Renewable	0	0	0	0.0%

Monitoring Based Commissioning (MBCx)

California Building Code and MM 15-04 require monitoring-based commissioning (MBCx) when planning and constructing new California public facilities. MBCx is a process to keep buildings operating as intended utilizing continuous monitoring of energy-using systems to identify issues. Besides implementing required MBCx at new facilities, DGS is continuously improving building automation controls (BAC) and energy management and control systems (EMCS) in its existing facilities wherever possible.

New and existing state buildings are required to incorporate MBCx to support cost-effective and energy efficient building operations, using an EMCS. State agencies managing state- owned buildings must pursue MBCx for all facilities over 5,000 square feet with EUIs exceeding thresholds described in Management Memo 15-04.

DGS owns and operates a performance monitoring analytical platform (PMAP) capable of providing continuous monitoring and real-time fault diagnostics for multiple DGS buildings, including web-accessible dashboards and performance reports. The California Energy Commission building (Sacramento) was the pilot site fully integrated into the platform and it was continuously commissioned in 2018. Metered utility data from other DGS buildings is automatically transferred directly from the utility servers to the DGS PMAP server. Web-accessible performance dashboards were operational in 2018.

Pending successful demonstration of the PMAP capabilities and identification of funding sources, DGS will prioritize other buildings to be gradually integrated into the platform in conjunction with required building automation and network upgrades.

Table 3.10 below includes DGS buildings surveyed and estimated potential MBCx implementation. Currently, no funding is designated to implement MBCx projects at DGS facilities. Some of these facilities may have plans for major renovations, sale or demolition and are not good candidates for MBCx until after improvements are made.

Table 3.10: Potential MBCx Projects

Facility	*Building Name*	Location	Floor Area (sq. ft.)	EMS Make, Model, Installation/ Upgrade	EMS Year	MBCx Capable, Difficult, or No EMS	MBCx To Start	MBCx Est. Cost ($)
001	State Capitol*	Sacramento	482,250	Ultavist OS23.1 V. 1.2 & Alerton BAC Talk 2.6	2010	Difficult	*	160,000
002	Jesse Unruh*	Sacramento	164,529	Alerton BAC Talk 2.6	2010	Capable	*	80,000
003	Library/ Cts- Annex	Sacramento	188,569	JCI Metasys 5.3.06500	1999	Capable	*	80,000
004	LOB	Sacramento	240,735	Alerton BAC Talk 2.6	2010	Capable	*	80,000
008	Energy Comm.	Sacramento	142,378	Alerton BAC Talk 2.6	2010	Capable	2018	80,000
009	CADA	Sacramento	48,139	I-sys	1997	Difficult	*	120,000
010	DOR	Sacramento	163,350	Alerton Envison BAC Talk	2007	Capable	*	80,000
011	Bateson*	Sacramento	293,516	Alerton BAC Talk 2.6	2010	Capable	*	80,000
013	EDD Solar*	Sacramento	236,000	Alerton Envison BAC	2012	Capable	*	80,000
016	Bonderson*	Sacramento	131,486	Siebe/Invensys/ Siemens BAS	1995	Difficult	*	120,000
018	Water Resources*	Sacramento	658,544	Ultavist	1995	Difficult	*	120,000
021	State Personnel	Sacramento	84,400	Alerton Envison BAC	2012	Capable	*	80,000
025	EDD HQ*	Sacramento	479,300	Alerton Envison BAC	2012	Capable	*	100,000
028	BOE*	Sacramento	644,293	Tridium Niagara AX framework	2013	Capable	*	100,000
030	Attorney General	Sacramento	367,301	Alerton Envision/ 2.01	2007	Capable	*	80,000
031	AG Child Care	Sacramento	4,893	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
036	SOS	Sacramento	460,170	Alerton Envision for Back Talk 2.60	2010	Capable	*	80,000
038	Library/ Cts- Annex	Sacramento	115,000	Alerton Back Talk	2013	Capable	*	80,000
039, 45	Office Bldgs 8,9	Sacramento	628,592	Alerton BAC Talk 2.6	2010	Capable	*	100,000
049	East-End Education	Sacramento	396,295	Workplace Pro Release 2. Tridium, Inc.	2007	Capable	*	80,000

051-054	East-End Complex	Sacramento	1,083,58	Honeywell EBI, Revision R410.2.	2011	Capable	*	100,000
057	CalNet	Sacramento	9,600	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
075	DOJ	Sacramento	354,058	JCI Metasys	2009	Capable	*	80,000
084	FTB	Sacramento	1,851,786	Alerton Back Talk, 2.5.	2012	Capable	*	120,000
095	Central Plant	Sacramento	70,000	Alerton BAC Talk 2.6	2010	Capable	*	80,000
330	Cal- Towers	Riverside	164,260	Automated Logic Control 4.1	2010	Capable	*	80,000
402	RMG Civic Center	San Francisco	1,055,105	Honeywell / EBI	2003	Capable	*	100,000
418	PUC	San Francisco	290,525	Invensys/Yama s Control	2001	Difficult	*	120,000
460	Redding State Bldg.	Redding	24,416	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
461	Red Bluff State Bldg.	Red Bluff	28,000	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
470	San Jose OB	San Jose	107,306	Niagara Workplace. 3.6.31.1	2010	Capable	*	80,000
480	Santa Rosa OB	Santa Rosa	97,377	Staefa Control System. Widows 98SE – Circa	2005	Difficult	*	100,000
OB-509	Ronald Reagan	Los Angeles	787,404	Honeywell Xbsi Front-End (Windows 98)	1991	Difficult	*	120,000
512	Junipero Serra	Los Angeles	519,101	Delta Control System	1997	Difficult	*	120,000
530	Van Nuys SOB	Van Nuys	147,495	Barber-Coleman/ Signal	1997	Difficult	*	100,000
602	Elihu Harris OB	Oakland	758,583	JCI Metasys	1999	Capable	*	100,000
701	Fresno OB	Fresno	185,937	Invensys Building Systems- Model UNC 520 Series-	2005	Capable	*	80,000
753	Fresno Water Res.	Fresno	35,400	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
074	State Garage Lot-2	Sacramento	283,050	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
076	Fleet Lot-55	Sacramento	177,500	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
078	Fleet Lot-14	Sacramento	265,100	N/A no EMS at this location	N/A	No EMCS	N/A	N/A

091	Blue Anchor*	Sacramento	24,900	Alerton Back Talk	2013	Capable	*	80,000
106	State Records Center	West Sacramento	82,682	N/A no EMS at this location	N/A	No EMCS	N/A	N/A
850	Mission Valley	San Diego	242,315	JCI Metasys	2014	Capable	*	100,000
860	Waddie P.	San Diego	292,148	JCI Metasys	2011	Capable	*	100,000
Total			**14,810,977**					**$ 3,600,000**

Financing

DGS uses all financing mechanisms available for energy savings projects including operations budgets, revolving loan funds, third-party financing, on-bill financing and on-bill repayment. These programs are described as follows:

1. Operations Budgets

   Departments can pay for energy projects out of their operational budgets.
2. Revolving Loan Funds

   Pursuant to Public Resources Code 25400, et seq., DGS manages a revolving loan fund with funds from the California Energy Commission's Energy Efficient State Property Revolving Fund. This fund is used to finance energy savings projects.
3. Third-Party Financing

   Pursuant to Government Code 14930, et seq., DGS can use the Golden State Financial Marketplace ("GS $Mart") Program, the state's centralized financing program available for state agencies to finance certain goods and services, for third-party financing of energy savings projects. Other third-party financing examples include using lenders through the energy contractor or utility company.
4. On-Bill Financing and On-Bill Repayment

   Departments often use on-bill financing to finance energy projects. On-bill financing allows the utility to incur the cost of the clean energy upgrade, which is then repaid by the customer on the utility bill. On-bill financing allows customers to overcome cost barriers by providing financing for energy savings upgrades, which are then paid over time via charges on their utility bill.

   On-bill repayment (also known as on-bill lending) options also allow the customer to repay the investment through a charge on their monthly utility bill, but with this option, the upfront capital is provided by a third-party lender, not the utility, and typically includes interest charges. On-bill lending has been in use for more than 30 years as a means to increase the commitment to clean energy and energy savings improvements.

a. Power Purchase Agreements

The DGS PPA program is an ideal project delivery model for state agencies and requires no capital outlay funds, no maintenance costs, no operational costs, and no repair or replacement costs from the host agency. The PPA program has no loan repayment requirements or financing terms. DGS has developed a program that allows developers to build, own, operate and maintain clean energy projects at state facilities. Agencies that host projects using the PPA and site license agreement (SLA) contracts have no financial investment requirements and do not need to operate or maintain the system. The developer is responsible for the system and electrical output. The developer recaptures its investment by selling the power back to the facility at a lower cost than the utility charges for the same power. The PPA is a contract between the host facility and the developer to purchase renewable electricity at a rate below traditional utility rates. The SLA is a lease agreement between the host agency, DGS, and the developer. Theseare both long-term, fixed-price contracts that require the developer to produce reliable and affordable clean energy for the host. The PPA and SLA term is usually written for 20 to 25 years and creates stability in operational budget management due to the fixed cost for electricity and reduces staff resource allocations because the host is not responsible to operate and maintain the system.

CHAPTER 4 - WATER EFFICIENCY AND CONSERVATION

California experiences the most extreme variability in yearly precipitation in the nation. In 2015, California had record low statewide mountain snowpack of only 5 percent of average while 2012-14 were the 4 driest consecutive years of statewide precipitation in the historical record. The 2017 water year (October 1, 2016-September 30, 2017) surpassed the wettest year of record (1982-83) in the Sacramento River and San Joaquin River watersheds and was the second wettest year in terms of statewide precipitation. However, the 2018 water year reverted to dry conditions and the 2019 water year was modestly above normal. The 2020 water year was California's fifth driest year. These potential wide swings in precipitation from one year to the next show why California must be prepared for either flood or drought in any year.

Therefore, using water wisely is critical. The EOs and SAM sections listed in the previous section help demonstrate the connection between water and energy use, (the water-energy nexus), water and climate change, and water and landscaping. Further, the impact of water uses by state agencies goes beyond the scope of these EOs and SAM sections and DGS management memos as these documents do not address such related issues as water runoff from landscaping and various work processes and the potential for water pollution or the benefits of water infiltration, soil health and nutrient recycling. However, by using holistic water planning, a well-crafted water plan can not only meet all state requirements but add considerable value and benefits to the organization and surrounding communities.

Department Mission and Built Infrastructure

DGS' mission is to deliver results by providing timely, cost-effective services and products that support our customers, while protecting the interests of the state of California.

The DGS portfolio comprises more than 18 million gross square feet of state-owned office space and other facilities statewide, contained within approximately 55 general-purpose state-owned facility sites. The average age of these buildings is around 45 years old, and the State Capitol building, is 142 years old. The DGS portfolio is occupied by more than 43,000 (mostly state) employees from many state agencies and from all three branches of state government. Water is used for heating and cooling systems in many of the buildings and for landscape irrigation, as well as for the restrooms, break rooms and cafeterias inside some of the buildings.

During the 2015-2017 drought, DGS took some drastic actions to conserve water, including:

- Cutting the amount of water used in landscaping at DGS properties by 20%.

- Shutting off fountains and water features on state property.
- Instituting a moratorium on nonessential landscaping projects at state facilities.
- Cancelling contracts for water-intensive window washing at state facilities.
- Eliminating all car washes in the State Garage other than those required for safety.

DGS awarded $10 million in grants to 30 executive-branch departments and District Agriculture Associations for 165 water-saving projects at their facilities. These grant-based projects were estimated to save over 300 million gallons of water annually. Additionally, DGS received $10 million in funding for water conservation projects at DGS facilities during the 2015-17 drought. This funded the replacement of fixtures and upgrades to irrigation systems and controls.

Table 4.1: 2020 Total Purchased Water

Purchased Water	Quantity (gallons)	Cost ($/yr)
Potable	208,324,000	$ 1,204,402
Recycled Water	0	$ 0
Total	**208,324,000 Gallons**	**$ 1,204,402**

Table 4.2: Properties with Largest Water Use Per Capita

Building Name	Area (ft^2)	Total 2020 Gallons	Total 2020 Irrigation in Gallons (if known)
095 Central Plant	74,486	47,250,200	
084 Franchise Tax Board	1,931,843	28,757,400	7,988,552
001 State Capitol	523,950	25,812,600	23,426,743
051-054 East End Complex	1,708,520	12,690,700	546,302
509 Ronald Reagan State Bldg.	944,187	8,836,900	
Total for Buildings in This Table	5,186,986 ft^2	123,347,800	31,961,597
Total for All Department Bldgs	18,515,781 ft^2	208,324,000	31,961,597
% of Totals	**28%**	**59 %**	**15%**

* State Capitol water use includes irrigation from Capitol Park.

** Does not include facilities with industrial functions (i.e., Central Plant or state printing plant).

Table 4.3: Properties with Largest Landscape Area

Building Name	Landscape Area (ft^2)
Franchise Tax Board, 8645 Butterfield Way, Rancho Cordova	1,420,093
Capitol Park, 11th Street, Sacramento	1,169,993
Dept. of Justice, 4949 Broadway, Sacramento	562,110
Mission Valley, 7575 Metropolitan Drive, San Diego	99,860
Caltrans D11, 4050 Taylor St, San Diego	90,294
Total Landscaping area for Buildings in This Table	3,342,350 ft^2
Total Landscaping for All Department Buildings	3,870,484 ft^2
% of Totals that is large landscape	**86%**

In 2019 and 2020, landscape projects designed to reduce use of irrigation water were in progress at State Capitol Park and at Department of Justice facility in Sacramento. At the State Capitol Park, permeable pavers were installed and lawn area was reduced by 50% at the north, south, and west entrances. In addition, the Capitol Park east entrance project replaced lawn with drought-tolerant plants and replaced irrigation rotors with drip irrigation. The square footage reduction of turf was 12,199 square feet.

Table 4.4: Department Wide Water Use Trends

Year	Total Amount Used (Gallons/year)	Percent Change From 2010 Baseline
Baseline Year 2010	284,057,600	N/A
2020	208,324,000	-27%
2020 Goal (20% reduction from 2010)	**75,733,600**	-27%

Table 4.5: Total Water Reductions Achieved

Total Water Use Compared to Baseline	Total Amount Used (gallons per year)
20% Reduction Achieved	208,324,000
Less than 20% Reduction	N/A
Totals	N/A
Department-Wide Reduction	27%

Table 4.6: Summary of Indoor Water Efficiency Projects Completed in 2015-2020

Building	Water Closets Replaced	Urinals Replaced	Faucet Aerators Replaced	Shower-heads Replaced	Projected Gallons Saved/Yr.	Percent Savings
001 – Capital West Wing	40	0	6	2	1,150,000	45%
001 – Capital East Annex	0	0	99	0	423,000	8%
002 – Unruh	7	15	37	0	375,000	25%
004 – LOB	69	0	64	0	512,000	47%
006 – Agriculture	0	0	13	2	46,000	8%
010 – Rehabilitation	0	0	12	6	85,000	8%
013 – EDD Solar	43	7	23	0	1,257,000	53%
016 – Bonderson	38	9	16	12	800,000	42%
019 – Veterans Affairs	1	7	16	0	129,000	11%
025 – EDD HQ	5	2	73	0	498,000	10%
036 – Secretary of State	116	27	110	12	1,248,000	56%
038 – Library & Courts Annex	37	14	47	8	322,000	58%
049 – East End Education	0	0	112	0	690,000	17%
051 – East End	0	0	112	19	720,000	16%
052 – East End	0	0	112	0	363,000	17%
053 – East End	0	0	112	0	365,000	16%
054 – East End	0	0	112	0	364,000	16%
084 – FTB San Diego	70	21	78	13	1,290,000	57%
084 – FTB Los Angeles	118	29	35	11	1,004,000	24%
091 – Blue Anchor	2	0	8	2	68,000	28%
153 – Caltrans District 3	0	0	105	0	191,000	15%
402 – San Francisco Civic Ctr.	265	47	325	12	174,000	
460 – Redding	0	1	2	0	64,000	19%

461 – Red Bluff	6	3	6	0	167,000	61%
470 – San Jose	32	9	25	0	395,000	58%
480 – Santa Rosa	0	0	41	0	80,000	19%
512 – Junipero Serra	0	0	55	4	614,000	16%
602 – Elihu Harris	0	0	80	10	939,000	15%
801 – San Diego State Bldg.	61	16	45	0	371,000	85%
TOTALS	**910**	**207**	**1881**	**113**	**14,878,000**	

Table 4.7: Summary of Boilers and Cooling Systems Projects Completed or In Progress

Year Completed	Water Saved (Gallons/yr.)	Number of Systems with Water Efficiency Projects
2014		
2015		
2016		
2017		
2018	54,000	1
2019		
2020		

Table 4.8: Summary of Landscaping Hardware Water Efficiency Projects Completed or In Progress

Year Funded	Water Saved (Gallons/yr.)	Estimated Annual Cost Savings	Total Number of Projects per Year
2015	3,510,000	20%	42 buildings
2016			
2017			
2018			
2019			
2020			

Table 4.9: Summary of Living Landscaping Water Efficiency Projects Completed or In Progress

Year Funded	Water Saved (Gallons/yr.)	Landscape Area MWELO* (ft2)	Climate Appropriate Landscape Area (ft2)
2016	702,140	35,062	24,199
2017	140,500	7,000	7,000
2018			
2019	1,234,616	129,000	129,000
2020	1,585,000	419,100	419,100

**MWELO is the Model Water Efficient Landscape Ordinance*

- Capitol Park permeable paver project: 50% lawn reduction at north, south and west entrances.
- Capitol Park east entrance: lawn replaced with drought tolerant plants and irrigation rotors replaced with drip irrigation.
- Projects completed in 2019-2020 include Department of Justice, Employment Development Department (EDD) Solar, Employment Development Department (EDD) headquarters, and Van Nuys State Building.

All of the landscape water efficiency projects include revising existing landscape to meet the Model Water Efficiency Landscape Ordinance (MWELO) 2015 and Executive Order B-29-15. The estimated water savings is 50% or better for each of the projects listed above. DGS staff is continually trained and able to implement projects once approved. When DGS works with contractors, the contracted staff are trained and do not require additional training to implement the projects.

Water Shortage Contingency Plans and Critical Groundwater Basins

Urban water suppliers are required to maintain Water Shortage Contingency Plans that are customized to local conditions. These plans include a staged response to water shortages and droughts lasting up to three years. When implementing the stages of the Water Shortage Contingency Plan, the water supplier will require increasingly stringent reductions in water use. EO 37-16 required DWR to strengthen the requirements for these Plans, including, among other proposed changes, the creation of common standards for each stage in the plan, and extending the drought planning from three to five years. For smaller water suppliers and rural communities not required to maintain a Water Shortage Contingency Plan, DWR works with counties to facilitate improved drought planning.

DWR has finalized these requirements in a Primer that can be found at: Making Conservation a CA-Way-of-Life-Primer.

State agencies are to be aware of their water suppliers' Water Shortage Contingency Plan and the potential impact each stage may have on their water use. State agencies are to have their own contingency plans in place for their building and landscaping water use in order to respond to any stage implemented by the water supplier.

The Sustainable Groundwater Management Act (SGMA) established a new structure for managing California's groundwater resources at a local level by local agencies. SGMA required, by June 30, 2017, the formation of locally controlled groundwater sustainability agencies (GSAs) in the State's high- and medium-priority groundwater basins and subbasins (basins). A GSA is responsible for developing and implementing a groundwater sustainability plan (GSP) to meet the sustainability goal of the basin to ensure that it is operated within its sustainable yield, without causing undesirable results. For those facilities located in critical groundwater basins, state agencies are to work with the local GSA plan.

Three DGS buildings are located in critical groundwater basins. Two buildings are located in Fresno, and one in Stockton. Building managers at all three buildings have obtained their city's water shortage contingency plans, are aware of the potential impact each stage may have on the facilities' water use and have created their own contingency plans accordingly. In addition, all three buildings practice the recommended best management practices for water efficiency and share this information with their tenants. The following table quantifies buildings in critical groundwater basins.

Table 4.10: Number of Buildings with Urban Water Shortage Contingency Plans and in Critical Groundwater Basins

Number of Buildings with urban water shortage contingency plans.	Number of buildings in critical groundwater basins	Total Amount of water used by buildings in critical groundwater basins (Gallons) in 2020 approximately
3	3	3,083,200

Building Inventories Summary

FMD has not conducted a recent inventory of items in the tables below (Table 4.11 and Table 4.12). FMD plans to work with its buildings' water providers to conduct onsite water audits to learn the most cost-effective ways to conserve water, including possibly replacing items listed in the table below.

Table 4.11: Summary of Building Inventory Needs

Number of toilets to be replaced	Number of urinals to be replaced	Number of faucet aerators to be replaced	Number of showerheads to be replaced * Changing to 1.8 gallons in 2020	Number of clothes washers to be replaced	Number of garbage disposals to be replaced	Number of pre-rinse valves to be replaced
NA	NA	NA	NA	NA	NA	NA

Heating and Cooling Systems Inventories Summary

Table 4.12: Summary of Boilers and Cooling Systems Inventory

Amount of Water Used for make-up (Gallons)	Number of flash tanks to purchase and install	Number of meters to purchase and install	Amount currently reused? (Gallons)	Remaining additional water suitable for other purposes (Gallons)
NA	NA	NA	NA	NA

Irrigation Hardware Inventories Summary

Landscaping typically uses 50 percent or more of an agency's total water use. While landscaping serves critical functions, the accompanying irrigation hardware, if not properly installed and maintained, can contribute to water waste. By reviewing and inventorying all irrigation hardware, it is possible to achieve significant water savings.

FMD surveyed and analyzed existing DGS irrigation controllers and hardware during the 2015-2017 drought, and installed numerous flow meters, submeters, smart controllers, and onsite weather devices to reduce water use for irrigation at DGS facilities, and to reduce labor of landscape maintenance crews.

Table 4.13: Summary of Irrigation Hardware Inventory

Irrigation Hardware Measures Enacted	Added to Existing Facilities in 2015
Flow meters installed	11
Smart controllers installed	11
Manual read meters installed	8
Central controllers installed	9
Onsite weather devices installed	12

Living Landscape Inventory

Far from being just an aesthetic or ornamental feature, landscaping plays a critical role around public buildings and facilities. From providing safety and security, to reducing

local heat islands, suppressing dust, reducing water runoff, maintaining soil health, aiding in water filtration and nutrient recycling, landscaping around public buildings is essential. Further, landscaping in public places frequently surrounds historic places and public memorials as well as provides pleasant public gathering spaces. The health and proper maintenance of these landscapes is vital to the physical wellbeing of California's people as well as to its social, cultural, political and historical life.

Additionally, the many vital ecosystem functions carried out by living public landscaping are critical in helping California meet its goals for greenhouse gas reduction, climate adaptation, and water and energy efficiency and water conservation.

Urban forests are vital to improve site conditions for occupants and visitors to buildings and the surrounding community. Large shade trees should be considered valuable infrastructure and given priority over other plants to maintain tree health. A voluntary urban forest plan is encouraged to assess individual trees and plan for additional tree plantings.

Table 4.14: Summary of Living Landscape Inventory

Landscape >500 sq. ft.	Landscapes to meet MWELO (sq. ft.)	Historical sites or memorials	Convert to water conserving landscape or erosion control (sq. ft.)
Capitol Park Paver Project	**21,727**	**1**	10,864
Capitol Park East Lawn	**1,335**	**1**	1,335
Capitol Park M Street	**7,000**	**1**	7,000
Van Nuys State Bldg.	**14,000**		14,000
Mission Valley State Bldg.	**80,000**		80,000
Red Bluff State Bldg.	**56,000**		56,000
Redding State Bldg.	**24,000**		24,000
Dept. of Personnel	**15,000**		15,000
Dept. of Rehabilitation	**16,000**		15,000
San Jose Bldg.	**11,000**		11,000
EDD Solar	**28,000**		28,000
EDD (025)	**42,000**		42,000
Department of Justice	**349,100**		349,100
Franchise Tax Board	**51,000**		51,000
Santa Rosa Bldg.	**8,000**		8,000
Fresno State Bldg.	**34,000**		34,000
DWR Fresno	**12,000**		12,000
Court of Appeals Riverside	**14,000**		14,000
Caltrans Marysville	**12,000**		12,000
Civic Center S.F.	**7,800**		7,800
CPUC	**2,000**		2,000
Stockton State	11,200		11,200

The Capitol Park Paver project resulted in a 50% water reduction at the north, south and west lawns. The permeable pavers allow runoff and rainwater to recharge the groundwater.

Pavers were selected versus plant material due to Capitol Park's high volume of public events. DGS designed the project in 2015 and completed installation in 2017.

The Capitol Park east lawn entrance required the removal of 1,335 sq. ft. of lawn, replacing it with drought tolerant plant material. The irrigation was also switched from spray rotors to drip irrigation. The project will save the state a minimum of 50% of Capitol Park's previous water use.

Five DGS state projects have been completed since 2015 and three in 2019. DGS will continue to convert DGS state landscapes per the latest Model Water Efficiency Landscape Ordinance.

Large landscape Water Use

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.

Table 4.15: Summary of Large Landscape Inventory and Water Budget

Name of Facility Sites/Locations with > 20,000 sq. ft. of Landscaping	Total Landscape Area per Facility	MWELO Recomm'd Yearly Water Budget per Facility	Total EPA WaterSense or Irrigation Association Certified Staff
Capitol Paver Project	**21,727**	**580,000 (exempt)**	2
Mission Valley (erosion control measures only)	**80,000**	**1,200,000**	1
Reddina State Blda.	**24,000**	**340,000**	1
Red Bluff State Bldg.	**56,000**	**800,000**	1
EDD (025)	**42,000**	**590,000**	1
EDD Solar	**28,000**	**400,000**	1
Dept. of Justice	**350,000**	**5,000,000**	1
Franchise Tax Board	**51,000**	**730,000**	1
Fresno State Bldg.	34,000	480,000	1

Table 4.16: Summary of Completed Living Landscaping Water Efficiency Projects (2017-2020)

Total of all Facilities	Est Annual Water Savings (Gallons)	Est Annual Cost ($) Savings	Sum of MWELO Landscape installed (Sq. Ft.)	Sum of Climate Appropriate Landscape Installed (Sq. Ft.)
8	**5,595,266**	**$31,893**	**311,865**	**311,865**

Best Management Practices

Building best management practices (BMPs) are ongoing actions that establish and maintain building water use efficiency. State agencies are required by DGS Management Memo 14-02 to implement the building BMPs outlined below.

BMPs can be continuously updated based on need and tailored to fit the facility depending on occupancy and specific operations.

Building Water Management BMPs

General Water Management

- Track monthly water use
- Check leak indicator on water meter when water is not in use

Leak Detection and Repair

Perform monthly visual leak detection survey on all water use fixtures:

- Toilets
- Urinals
- Faucets – Check faucets for proper aerators (kitchen faucets 2.2 gpm and lavatory faucets 0.5 gpm) and install aerators or laminar flow devices if necessary.
- Showers – Check shower head flow rates and install showerheads using no more than 2.0 gpm with trickle flow controls.

Kitchens

- Replace any broken or damaged dishwasher racks. Run dishwasher only when full to maximize capacity.
- Check all equipment water temperatures and flow rates against the manufacturer recommendations. Use the recommended minimum temperature and flow to maximize savings.
- Turn off the continuous flow used to wash the drain trays of the coffee/milk/soda beverage island. Clean thoroughly as needed.
- Adjust ice machines to dispense less ice if ice is being wasted.
- Reduce the flow to dipper wells (troughs) for ice cream and butter scoops, and other frequently used utensils.
- Presoak utensils and dishes in basins of water, rather than in running water.
- Do not use running water to melt ice in bar sink strainers.
- Do not use running water to defrost food.
- Do not allow water to flow unnecessarily.

Laundry Facilities

- Run washer only when full to maximize capacity.
- Set water level and water temperature appropriately according to the load.

Building Heating and Cooling Systems BMPs

- Develop and implement a routine inspection and maintenance program to check steam traps and steam lines for leaks.
- Repair leaks and replace faulty steam traps as soon as possible.
- Develop and implement a boiler tuning program to be completed a minimum of once per operating year.

- Provide proper insulation on steam and condensate return piping, as well as on the central storage tank.
- For both cooling towers and boilers, obtain the services of a water treatment specialist to prevent system scale and corrosion and to optimize cycles of concentration. Treatment programs should include routine checks of boiler water chemistry.
- Develop and implement routine inspections and maintenance programs on condensate pumps.
- Regularly inspect both the water side and fire side of the boiler. If needed, clean the tube surfaces to ensure optimal heat transfer, thereby maximizing system energy efficiency.
- Adjust boiler and cooling tower blowdown rate to maintain total dissolved solids at levels recommended by manufacturers' specifications.
- Shut off water-cooled air conditioning units when not needed or replace water- cooled equipment with air-cooled systems.

Landscaping Hardware Maintenance BMPs

- Install check valves, swing joints and replace nozzles as needed.
- Install faucet timers for hose or hand irrigation.
- Install shutoff nozzles or quick-couplers for all hoses.

Living Landscape BMPs

- Prioritize and assign value to plants within a landscape.
- During drought or other water shortages, give trees and large shrubs highest priority for survival.
- Continue to water trees and shrubs as needed.
- Refresh mulch as needed. All bare soil must be covered by a minimum of 3 inches of mulch.
- Adjust the irrigation schedule for seasonal changes.
- Test irrigation system monthly to check for leaks and misalignment, and other malfunctions. Repair immediately with the correct parts. Adjust irrigation systems as needed.
- Water early in the morning or in the evening when wind and evaporation are lowest. Never water between 10 a.m. and 6 p.m.
- Prevent runoff! Make sure sprinklers are directing water to only landscape areas, avoiding hardscapes such as parking lots, sidewalks or other paved areas. No irrigation water should ever be permitted to leave the site.
- Use water use classifications of landscape species to find plant water use requirements and only water landscapes according to the plant water needs.
- Plant species native to the climate zone.

- Use bio-swales and other forms of rainwater capture to keep water onsite.
- Incorporate plantings for pollinators.
- When planting new areas or replacing plants, add compost to the soil (entire planting areas, not just planting holes) at a rate of 4 cubic yards per 1,000 square feet to a depth of 6 inches, unless contradicted by a soil test.
- Fix leaks immediately.

FMD building teams and groundskeeping teams report that they follow the Best Management Practices (BMP) indicated above. To reinforce awareness of BMPs, FMD created a SharePoint site with sustainability policy information (including BMPs) that is accessible by all building managers. Building managers distribute BMPs for water efficiency to their staff and tenants at least annually. Also, custodians are expected to perform at least monthly the BMP of visual leak detections of all water use fixtures, and this practice is indicated in FMD's current custodian training manual. FMD's Customer Service Center receives calls from building occupants including calls reporting potential leaks and then onsite building team investigates and resolves.

Finally, FMD's landscape architects incorporate sustainable landscape practices in their landscape projects.

Monitoring, Reporting and Compliance

DGS monitors and reports water use monthly into the Energy Star Portfolio Manager and is in compliance with water use reduction targets established by policies.

CHAPTER 5 - GREEN OPERATIONS

Greenhouse Gas (GHG) Emissions

State agencies are directed take actions to reduce entity-wide greenhouse gas emissions by at least 10% by 2015 and 20% by 2020, as measured against a 2010 baseline.

DGS has reduced entity-wide GHG emissions by 64% since 2010 through various measures outlined below.

- **Energy Efficiency** – DGS has reduced total grid-based energy use at DGS facilities by 19.5% since 2010, even with its total building area increasing during that same time frame. This contributed to GHG emission reductions during that period.

- **Onsite Renewable Energy** – DGS installed 3 MW of onsite renewable energy in 2017 at the Franchise Tax Board facility, 0.8 MW at Caltrans District 3 in 2018, and 2.3 MW at the Department of Justice building in 2019, through PPAs. Onsite renewable energy generation contributes to reduced GHG emissions from state operations.

- **Purchased Offsite Renewable Energy** – In 2020, DGS purchased 83.1 gigawatt hours (GWh) of renewable energy through a long-term SolarShares program from the Sacramento Municipal Utility District (SMUD). Additionally, DGS purchased an additional 60.6 GWh of short-term renewable energy offsets through the SMUD Greenergy program. This constitutes **72%** of total DGS electricity use from renewable energy sources and greatly reduced DGS' GHG emissions from building operations.

- **Fuel-Efficient Vehicles** – DGS leads by example as it integrates fuel efficient ZEVs into California government. Adding fuel-efficient vehicles to the fleet through ZEV purchasing surpassed 2015 requirements of 10% and will increase to 25% by 2020. In addition, DGS is providing charging stations in its owned facilities for workplace and fleet vehicle use. To further encourage GHG reductions, DGS provides preferential parking policies for ZEVs in state-owned garages.

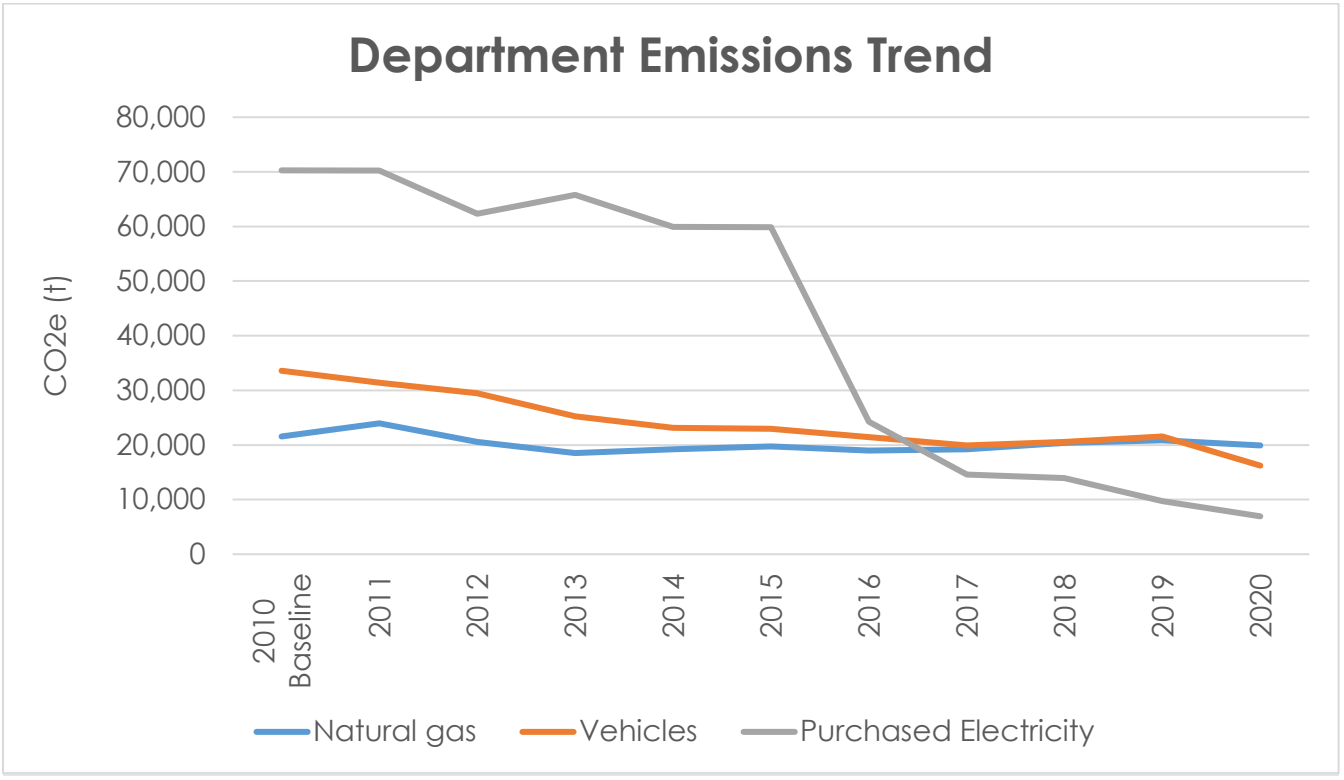
- **Biofuels** – DGS' renewable Diesel R-99 contract provides contracted pricing to the state of California and has a lower carbon intensity than conventional diesel. Because this commodity is made from renewable resources, it is considered an environmentally preferable purchase and contributes to reducing GHG. Biofuel emissions are classified as "biogenic emissions," which do not count against state emissions. In fact, in 2018 renewable diesel removed 45,000 tons of GHG emissions that were placed into this separate category.

DGS does not purchase diesel fuel for its vehicles and therefore has nothing to report regarding renewable diesel. State contracts may be open to local governmental agencies as defined by Public Contract Code Section 10298.

Table 5.1: GHG Emissions since 2010 (Metric Tons)

Emissions Source	2010 Baseline	2014	2015	2016	2017	2018	2019	2020	% Change since Baseline
Natural gas	21,556	19,233	19,748	18,996	19,210	20,361	20,841	19,906	**-8%**
Vehicles	33,588	23,165	22,954	21,460	19,901	20,533	21,533	16,214	**-52%**
Purchased Electricity	70,272	59,956	59,870	24,234	14,570	13,956	9,717	8,939	**-87%**
Total	125,416	102,354	102,572	64,690	53,681	54,850	52,091	45,059	**-64%**

Graph 5.1: GHG Emissions since 2010



From 2010-2020, DGS had a 64% decrease in total GHG emissions. DGS has reduced its emissions by 80,357 metric tons of CO_2e since 2010.

Low Emitting Landscaping Equipment

State agencies are to use manual landscape and hardscape maintenance as much as possible to reduce air pollution, dust and noise. These measures are addressed in SAM Section 1821.6.

DGS' Facilities Management Division (FMD) and Office of Sustainability and California Air Resources Board worked together to update and revise the SAM policy to increase the use of low-emitting landscape equipment. The SAM policy includes replacing gas-powered equipment with low-emitting equipment where feasible and as equipment replacement schedules allow. FMD groundskeeping teams currently use some of this low-emitting landscape equipment, and they have provided demonstrations of the equipment at various state events.

Building Design and Construction

Executive Order B-18-12 requires that all new buildings, major renovation projects and build-to-suit leases over 10,000 square feet shall obtain LEED Silver certification or higher. All new buildings under 10,000 square feet shall meet applicable CalGreen Tier 1 Measures. New buildings and major renovations greater than 5,000 square feet are also required to be commissioned after construction.

- DGS designs and builds all new buildings, major renovations, and build-to-suit leases for DGS and all state customers to become LEED Silver or higher certified.
- Several new projects under construction for DGS and ARB will be LEED Platinum certified when they are completed, even higher than the state policy.

Table 5.2: New Construction since July 1, 2012

Facility Name	LEED Certification Type & Level Achieved	Commissioning Performed (Y/N)
Caltrans District 3 Headquarters, Marysville	LEED – NC Silver	Y
Governor's Mansion Renovation	LEED – NC Gold	Y
Clifford L. Allenby Building	LEED Platinum	Y

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 and shall use adhesives, sealants, caulks, paints, coatings, and aerosol paints and coatings that meet the volatile organic chemical (VOC) content limits specified in *CALGreen.*

To ensure that new construction incorporates the IEQ provisions of CALGreen Tier 1, DGS has worked with the U.S. Green Building Council (US GBC) to see that new projects built to California's robust energy and CALGreen building codes are preapproved for

significant streamlining of fundamental LEED requirements including incorporating the IEQ provision of CALGreen Tier 1. This recognition in LEED makes it possible for projects built to the state's building codes to achieve all prerequisites in LEED and up to six points. All projects subject to EO B-18-12 now have a simplified path to achieving both LEED and CALGreen compliance.

LEED for Existing Buildings Operations and Maintenance

All State buildings over 50,000 square feet were required to complete LEED-EBOM certification by December 31, 2015 and meet an Energy Star rating of 75 to the maximum extent cost effective.

- DGS hired a consultant to develop a volume certification prototype and to certify the DGS portfolio through the LEED Volume Certification program. This process lasted several years, with much success. The Volume Certification program allowed DGS to submit multiple certifications in batches using the prototype system, limiting duplicate documentation, and at a reduced volume certification price. Because of the accuracy of the submittals, USGBC didn't need to review every submission so they audited a percentage of DGS projects, saving review time. LEED-EBOM certifications expire after five years. Originally, DGS certified 26 buildings between 2009-2011 with assistance from a different consultant. Through the Volume Certification Program, half of those previous buildings (13) were recertified. Eleven more existing DGS buildings were LEED certified through this program that had not been certified before. The most recent LEED –EBOM certifications were completed in 2017-2018.

- The major barriers for LEED certification for some of the DGS portfolio include meeting the minimum energy efficiency requirement of an Energy Star score of 75. Several DGS buildings are well below that threshold, and some are closer to meeting it, requiring improvement in energy efficiency to become certified. Other barriers include lack of submetering on some campuses, and inconsistent district energy data at the Sacramento Central Plant. Some previously LEED certified campuses were not able to recertify due to new requirements for individual building metering.

- DGS is working to develop ESCO-funded projects that will improve energy efficiency to exceed an Energy Star score of 75 in buildings pursuing LEED-EBOM certification. Some of these buildings are working to achieve even deeper efficiency to meet ZNE Source EUI targets for existing buildings.

Table 5.3 below quantifies how many of DGS' large buildings have achieved LEED-EBOM.

Table 5.3: LEED for Existing Buildings and Operations

Number of Buildings over 50,000 sq. ft. and eligible for LEED EBOM	Number of Building over 50,000 sq. ft. that have achieved LEED EBOM	Percentage of buildings over 50,000 sq. ft. required to achieve LEED EBOM that have achieved it
49	30	61%

Indoor Environmental Quality

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.

Indoor Environmental Quality must also be maintained through the use of low emitting furnishings, cleaning products and cleaning procedures.

New Construction and Renovation

DGS incorporates voluntary measures from CALGreen related to IEQ in all building projects through its adherence to the governor's order that all project incorporate LEED certification requirements into the scope of the work.

- Adhesives, sealants, caulks, paints, coatings and aerosol paints and coatings that meet the volatile organic chemical (V O C) content limits specified in CALGreen align with requirements adopted in the USGBC LEED program.

- DGS utilizes project specifications that include LEED environmental quality (EQ) prerequisite minimum indoor air quality performance criteria that aligns with the CALGreen Part 11 requirements related to IEQ. These specification requirements are reviewed against material submittals from the contractor during construction and verified as used by the DGS inspections staff. Contractors found not following these specifications are subject to a hold on payment for the materials and installation until corrections can be made. Likewise, carpet systems, carpet cushions, composite wood products, resilient (e.g., vinyl) flooring systems, and thermal insulation, acoustical ceilings and wall panels that meet the V O C emission limits specified in CALGreen align with requirements adopted in the USGBC LEED program.

For all new construction and renovation projects, DGS includes the following measures into our building process:

- DGS includes commissioning to ensure proper operation of all building systems, including delivering the required amount of outside air.
- DGS utilizes project specifications that include commissioning for HVAC system performance including the required amount of outside air. These specification

requirements are reviewed with the contractor during the project. When required, DGS engages commissioning agents to work with DGS inspections staff to ensure that outside air exchanges of installed equipment meet the project specifications.

- DGS utilizes project specifications that include LEED EQ prerequisite minimum indoor air quality performance criteria that aligns with the CALGreen Chapter 5.5 requirements related to IEQ. These specification requirements are reviewed against material submittals from the contractor during construction and verified as used by the DGS inspections staff. Contractors found not following these specifications are subject to a hold on payment for the materials and installation until corrections can be made.

- DGS utilizes project specifications that include LEED Performance criteria that aligns with the CALGreen air filtering and ozone removing devices. These specification requirements are reviewed against material submittals from the contractor during construction and verified as used by the DGS inspections staff. Contractors found not following these specifications are subject to a hold on payment for the materials and installation until corrections can be made.

- DGS utilizes project plans and specifications that include airflow monitoring systems that are integral to the overall building management systems required on all projects seeking to meet and exceed CALGreen, Title 24 and LEED requirements. These specification requirements are reviewed against material and equipment submittals from the contractor during construction and verified as used by the DGS inspections staff. Contractors found not following these specifications are subject to a hold on payment for the materials and installation until corrections can be made.

DGS maximizes daylighting (providing natural daylight to work spaces) in new construction by:

- Where possible, providing a direct line of sight to the outdoors via vision glazing between 2.5 and 7.5 feet above the finished floor in 90 percent of all regularly occupied areas.

- Requiring that all designs for new building projects follow design principals that incorporate features that reduce electricity and meet ZNE, LEED, and CALGreen requirements for daylighting and vision glazing such as those mentioned above. DGS submits these designs to the US GBC for certification that the designs meet the LEED requirements prior to putting these designs out to bid.

- Using top lighting and side lighting, light shelves, reflective room surfaces, as a means to eliminate glare.
- Incorporating photo sensor controls to provide artificial lighting only to areas of need in lieu of uniformly applying artificial lighting regardless of need.

- Requiring that all designs for new building projects follow design principals that incorporate these features that reduce electricity and meet ZNE, LEED, and CALGreen requirements for daylighting and vision glazing such as those mentioned above. DGS submits documentation to the US GBC for certification that the designs meet the LEED requirements prior to putting these designs out to bid.

Furnishings

DGS ensures that all furniture and seating purchased by the department complies with either:

- The DGS Purchasing Standard and Specifications (Technical Environmental Bid Specification 1-09-71-52, Section 4.7) or
- The American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) Standard 1 8 9.1-2011 (Section 8.4.2.5).

To achieve this, DGS utilizes project specifications that include meeting these requirements. These specification requirements are reviewed against material submittals from the contractor during construction and verified as used by the DGS inspections staff.

DGS utilizes the California Prison Industry Authority (CAL PIA) for all the furniture purchases. CALPIA provides aid in acquiring for outside agencies as well as for DGS' own purchases. Where CALPIA is unable to meet the furniture needs, DGS utilizes project specifications that include DGS' Purchasing Standard and Specifications (Technical Environmental Bid Specification 1-09-71-52) requirements. These specification requirements are reviewed against material submittals from the contractor during construction and verified as used by the DGS inspections staff.

Cleaning Products

In 2017, The DGS Facilities Management Division (FMD) produced the Green Purchasing Memo in collaboration with LEED Existing Buildings (EB) certification consultant CodeGreen and DGS' Office of Business and Acquisition Services. Also in 2017, DGS FMD provided training on its use at the annual statewide building managers' meeting and distributed it electronically to requisitioners who purchase custodial supplies. The memo provides comprehensive guidance and a certified product database to make it easy for those purchasing cleaning and other custodial supplies to select Green Seal or Ecologo certified products. Currently, the Green Purchasing Memo is available at FMD's SharePoint site of

Sustainability policies and best practices. Also, DGS FMD utilizes the DGS Buying Green Website which provides information on green cleaning products. FI$Cal reports provide some capability for FMD to monitor green custodial supply purchasing patterns for the various FMD building locations. The FI$Cal reports have also been used for documentation of purchasing green cleaning products as part of the LEED-E BOM certification process.

In addition, in 2019, FMD's custodial training manual contains information on green cleaning products and procedures, including references to using CAL PIA's Green Seal certified cleaning products. In 2018, FMD conducted a blind test of green cleaning products against non-green cleaning products and found the green cleaning products were as effective or better in the test.

Cleaning Procedures

FMD's custodial training manual includes information on maintaining entryways according to policy as well as using green cleaning procedures. As part of the LEED-EBOM certification process, FMD buildings exceeded the entryway maintenance requirements and achieved points for demonstrating this.

In building locations where FMD does not currently have vacuum cleaners that achieve the Carpet and Rug Institute Seal of Approval, it is policy to replace with compliant equipment as current equipment reaches end of life.

HVAC Operation

DGS buildings that participated in the LEED Existing Buildings Volume Certification program in 2017-18 met LEED EB IEQp1, which required compliance with ASHRAE Standard 62.1-2007, or alternatively, a minimum of 10 cubic feet/minute per person under normal operating conditions if the existing system cannot be modified to meet the former standard.

FMD leverages its Enterprise Asset Management System, Maximo, to maintain its preventive maintenance program including all HVAC-related hardware and systems. This includes documenting completion of process steps, requests for work on equipment not operating correctly, failure histories, and corrective action taken by FMD field staff and contractors. FMD has a Preventive Maintenance workgroup comprised of building managers and building engineers that work toward constantly improving FMD's preventive maintenance practices. Most of the best practices in bullet points above are already indicated in the Maximo preventive maintenance system, and the Preventive Maintenance workgroup will work toward adding those that are not.

Each preventive maintenance work order includes the process and procedure steps required to maintain equipment, including HVAC equipment. Preventive maintenance actions include filter replacement, coil inspection and cleaning, biocide pad replacement, water treatment testing and documentation,

inspection and operational testing of all dampers, actuators, linkages and economizer hardware. Periodic preventive maintenance tasking for building automation systems, where those exist, include the confirmation of minimum set points for fresh air intake systems and hands- on/visual confirmation of operation for system hardware.

FMD continues to work toward maximizing the use of its Maximo system in all of its buildings. As an example of these efforts, Maximo training videos are made available to FMD on its Sharepoint site.

Integrated Pest Management

Department staff and contracted pest management companies will follow an integrated pest management (IPM) strategy that focuses on long-term prevention of pest problems through monitoring for pest presence, improving sanitation, and using physical barriers and other nonchemical practices. If nonchemical practices are ineffective, Tier 3 pesticides may be used, progressing to Tier 2 and then Tier 1 if necessary.

DGS' FMD Contracts Unit works to ensure that its pest management contracts contain the integrated pest management process language described above. As of August 2021, the Contracts Unit reported that all of its pest contracts are IPM specified. All FMD staff can refer to the IPM policy information in Management Memo 15-06.

Table 5.4 Pest control contracts

Pest Control Contractor	IPM Specified (Y/N)
Hunter Services, Inc.	Y
Epic Pest Control	Y
EcoTech Pest Management	Y
Allpro Pest Services	Y
Advanced Integrated Pest Management	Y
EagleShield Pest Control	Y
California Pest Management	Y
EcoGuard Pest Management	Y
Newport Exterminating	Y
Big Time Pest Control	Y

Waste and Recycling Programs

DGS' designated waste and recycling coordinator works with the building management team at DGS headquarters (the Ziggurat) and with FMD to submit the annual report to CalRecycle. This report includes waste and recycling information for the Ziggurat building, the State Capitol, the Capitol Park Grounds office, the Legislative Office building, the Blue Anchor building, the Jesse Unruh building, the State Library and Stanley Mosk Library and Courts buildings, the State Personnel Board building, the Central Plant, the Secretary of State building, and the State Records Center. The report also includes the total number of DGS employees located in these buildings, and the total amounts disposed (provided by the waste haulers). In addition to total amount of trash hauled, the waste haulers provide the amount of recycling hauled, including amounts of organic materials. The DGS designated recycling coordinator also provides information on material exchange efforts, waste prevention and reuse efforts, green procurement, and training and education.

Table 5.5: State Agency Reporting Center (SARC) Report on Total Waste per Capita

Per Capita Baseline	2019	2020	Total Waste 2019	Total Waste 2020	% Change from 2019/2020
18.4	4.16	3.81	940.7 tons	879.92 tons	-6%

DGS continues to work with its tenant agencies, all occupants of its buildings, and its waste haulers to minimize the amount of waste hauled each year. Since 2018, the DGS Ziggurat building and the above referenced FMD buildings have provided recycling and organic waste recycling services. DGS shares training materials electronically and info from the waste haulers that provide services to each building. Trash hauled and recycling hauled are shared each year with each building, and this info is also shared with tenant representatives as well.

Recycling

Recycling is the practice of collecting and diverting materials from the waste stream for remanufacturing into new products, such as recycled-content paper. Stewardship programs help collect and recycle carpet, paint, pharmaceutical and sharps, and mattresses. AB 341, Mandatory Commercial Recycling (Chesbro, Chapter 476, Statutes of 2011) requires businesses and public entities that generate four cubic yards or more of commercial solid waste per week to arrange for recycling services under the goal of source reducing, recycling or composting 75% of solid waste generated statewide.

DGS works with its haulers to recycle beverage containers, glass, plastics, cardboard, newspaper, and office paper. In addition, DGS provides bins for batteries and sends toner cartridges for recycling. DGS promotes the reduction of paper by encouraging electronic documents through online forms, SharePoint sites, One Drive, and through emails and the intranet.

FMD building managers also work with the tenants from various state agencies to encourage recycling. FMD building managers report that sometimes tenants collect their own recyclables for fundraising efforts. Also, FMD building management teams report that the challenge for all building occupants is putting their recycling items in the appropriate bin. Haulers may charge additional fees for items placed in the wrong bins. FMD displays signs above the bins to show which items go in each bin, and FMD provides presentations in tenant meetings to prevent items from being placed in the wrong bin.

Organics Recycling

State agencies must implement AB 1826 (Chesbro, Chapter 727, Statues of 2014). State agencies that generate 2 cubic yards or more of commercial solid waste (total trash, recyclables, and organics) per week shall arrange for organic waste recycling services.

Organic waste includes:

- Food waste
- Green waste
- Landscape and pruning waste
- Nonhazardous wood waste
- Food-soiled paper

The exemption under 42649.82 (e)(3)(E) related to businesses that generate one cubic yard or less of organic waste is no longer in effect. Furthermore, CalRecycle has extended the current AB 1826 rural exemption until December 31, 2026.

Effective January 1, 2022, state agencies must implement SB 1383 (Lara, Chapter 395, Statutes of 2016). State agencies are currently required to maintain mandatory commercial recycling and organic recycling programs, including ensuring that properly labeled recycling containers are available to collect bottles, cans, paper, cardboard, food waste, and other recyclable materials. SB 1383 builds upon these efforts by identifying non-local entities and expanding the definition of organic waste to include food scraps, landscape and pruning waste, organic textiles and carpets, lumber, wood, manure, biosolids, digestate, and sludges.

Under SB 1383, non-local entities include:

- Special districts
- Federal facilities
- Prisons
- State Park facilities
- Public universities and community colleges
- County fairgrounds
- State agencies

SB 1383 organics collection requirements are effective January 1, 2022.
In 2018, DGS created Administrative Order 18-01, which made it policy for DGS building managers to establish organic waste recycling services, provide appropriate receptacles and signage, and work with their tenant recycling coordinators to provide information on these efforts and to work with waste haulers to provide recycling coordinators from various tenant state agencies with the amounts of trash and recycling hauled. Some buildings in downtown Sacramento have reported challenges with adequate space for the increase in the number of exterior bins outside the buildings. As of September 2019, these buildings have worked with their waste hauler to share exterior bins between the buildings.

Edible Food Recovery Program
Commercial edible food recovery begins January 1, 2024, for Tier 2 generators which most state agencies would fall under. SB 1383 requires that by 2025 California will recover 20 percent of edible food that would otherwise be sent to landfills, to feed people in need.

Hazardous Waste Materials including Electronic Waste

DGS encourages the use of CAL PIA's electronic waste recycling program. The CAL PIA E-Waste Program picks up and refurbishes or recycles e-waste at no cost.

Material Exchange

These programs promote the exchange and reuse of unwanted or surplus materials from your agency. The exchange of surplus materials reduces the cost of materials/products for the receiving agency and results in the conservation of energy, raw resources, landfill space, including the reduction of greenhouse gas emissions, purchasing and disposal costs.

- DGS sends items no longer in use – such as chairs, bookcases, tables, and office furniture – to a DGS surplus facility. The DGS Ziggurat building provides employees with a storage room for used desktop supplies, books, binders, desk lamps, and calculators available for reuse.

Waste Prevention/Reuse

As described in the Material Exchange section, DGS utilizes its surplus facility to reuse furniture items. For waste prevention, DGS encourages using electronic documents as much as possible to prevent the use of paper documents.

Training and Education

Pursuant to AB 2812 (Gordon, Chapter 530, Statutes of 2016), each state agency is required to provide adequate receptacles, signage, education, and staffing, and arrange for recycling services consistent with existing recycling requirements for each

office building of the state agency or large state facility. The bill requires, at least once per year, each covered state agency and large state facility to review the adequacy and condition of receptacles for recyclable material and of associated signage, education, and staffing. Additionally, the bill requires each state agency to include in its existing Report to CalRecycle a summary of the state agency's compliance with the act.

- The Ziggurat building, where DGS is headquartered, provides displays in its atrium on what goes in the three-bin recycling systems. FMD provided its staff and tenants with an electronic memo describing the addition of organic waste recycling services as well as a toolkit describing what goes in the interior bins. DGS works with its haulers to provide appropriate signage that describes what is accepted in each bin, and works with its haulers to provide trainings and training materials to FMD staff and tenants. DGS Administrative Order 18-01 requires building managers to review the adequacy of receptacles and signage at least annually.

Foodservice Items

SB 1335 (Allen, Chapter 610, Statutes of 2018) requires food service facilities located in a state-owned facility, operating on or acting as a concessionaire on state-owned property, or under contract to provide food service to a state agency to dispense prepared food using food service packaging that are reusable, recyclable, or compostable. CalRecycle approved proposed regulations December 31, 2020 to establish the process and criteria to determine what types of food service packaging are reusable, recyclable, or compostable. CalRecycle must also publish a list of food service packaging that meets these criteria within 90 days of the regulation going into effect. Food service facilities will only be allowed to purchase food service packaging from the approved list, which will be updated at least once every five years.

- DGS has changed leases executed in 2020 to include requirements for compostable or recyclable food service packaging.

Environmentally Preferable Purchasing

State agencies are required to purchase and use environmentally preferable products (EPP) that have a reduced effect on human health and the environment when compared with competing goods that serve the same purpose.

Additionally, the State Agency Buy Recycled Campaign (SABRC) is a joint effort between CalRecycle and the Department of General Services (DGS) to implement state laws requiring state agencies to purchase recycled-content products (RCP) and track those purchases. State agencies and their contractors must track purchases that fall under eleven product categories. Click here for the current product categories. It complements the intent of the Integrated Waste Management Act (AB 939, Sher, Chapter 1095, Statutes of 1989 and Public Resources Code 4000 et al), which was

enacted to reduce the amount of waste going to California's landfills. An annual report detailing state agencies' annual RCP purchase is due to CalRecycle by October 31 of each year.

Pursuant to Public Contract Code Sections 12203 and 12211 (AB 2675, Lowenthal. State agency: public contracts), effective January 1, 2020, this bill requires each state agency to ensure that at least 75 percent of the total purchases under the reportable categories contain recycled-content products meeting the minimum percentage content, except for paint, antifreeze, and tires which would remain at the 50 percent requirement. Click here for current SABRC compliance percentages

Reducing Impacts

The environmental impact of the goods we buy is often larger than the impact of our own department operations. Our department is committed to reducing the environmental impact of our goods and services we purchase.

DGS is committed to buying goods and services that lessen impacts to public health, natural resources, economy and the environment.

- DGS will reduce environmental impacts such as energy, water and natural resource conservation when making purchasing decisions by adhering to all the DGS purchasing standards identified in the DGS Procurement Division's Buying Green website. OBAS' management team will consistently communicate the available contracts and resources available to the team, which will result in an increase in green purchasing.
- DGS has incorporated "green language" in its service contracts to support EPP initiatives and encourage environmentally friendly products used in service contracts.
- DGS continues its efforts to develop a comprehensive method of capturing SABRC information in its service contracts aligning to the public works contracts process.
- DGS continues to ensure the goods and services we buy meet the current DGS purchasing standards and specifications available from the DGS Buying Green website, providing consistent communication and awareness to DGS customers of the resources available as well as the value and benefit to the environment, the community and to the department.

DGS continues to take action to ensure purchases support EPP initiatives. DGS ensures that the goods and services procured meet the current DGS Purchasing Standards and specifications available from the Department of General Services Buying Green website. DGS incorporates EPP requirements for the below product categories into the solicitation documents to ensure purchases are EPP compliant.

- Building and Maintenance (Purchasing Standard DGS 39101628 LED Lamps Purchasing Standard, DGS 39111500 Office Desk Lamps Purchasing Standard and/or contracts listed on the Buying Green site)
- Cleaning Supplies (Purchasing Standard DGS 47131800 Janitorial Supplies, Cleaners and/or contracts listed on the Buying Green site)
- Food (Contracts listed on the Buying Green site)
- Ground Maintenance(Contracts listed on the Buying Green site)
- Office Equipment (Purchasing Standard DGS 43211501 Computer Servers, DGS 52161505 Televisions Purchasing Standard, DGS 43191501 Mobile Phones and/or contracts listed on the Buying Green site)
- Office Supplies (DGS 56112100 Seating Purchasing Standard and/or contracts listed on the Buying Green site)
- Paper Products (DGS 14111700 Janitorial Paper Products Purchasing Standard, DGS44120000 Office Paper Products Purchasing Standard and/or contracts listed on the Buying Green site)
- Safety (Contracts listed on the Buying Green site)
- Transportation (Contracts listed on the Buying Green site)

Measure and Report Progress

DGS is continuing to develop strategies that will consistently support EPP initiatives in the present and into the future. DGS will continue the current strategies this year:

- Increase EPP spend include identifying top five percent of spend with largest opportunity to "green"
- Measure percent EPP spend in comparison to non-EPP spend (see The Green Buyer site for data)
- Incorporate EPP criteria in the goods and services the state buys
- Embed sustainability roles and responsibilities into purchasing procedures
- Train buyers in the benefits of buying EPP products, how to apply EPP best practices, the importance of accuracy in recording buys within SCPRS and reporting labor separate from goods in service contracts, and listing EPP goods by line item
- Engage and educate suppliers to offer EPP products when selling to the state

DGS efforts to measure, monitor, report, and oversee progress to increase EPP include:

- Continue to utilize FI$Cal to obtain EPP data to measure and report annual progress.
- Current EPP progress identified an estimated 28% increase in EPP reporting for Printing, Copy & Writing Paper (89%) over last year (61%).

- Continuous efforts to monitor EPP initiatives will be to monitor OBAS EPP progress and begin communicating monthly EPP totals to the Acquisition Analyst
- Continue to encourage EPP initiatives and the use of the above product categories.

DGS adheres to all DGS SABRC requirements by incorporating recycled content product provisions in all our commodity and public works contracts. Department analysts review and confirm postconsumer content information is completed and submitted as required. DGS's goal is to obtain the highest percentage for SABRC compliance in each category. As opportunities in different categories are more readily available we continue to look for better opportunities in the non-compliant categories.

Table 5.6 below identifies DGS' State Agency Buy Recycled Campaign for fiscal year 19/20:

Table 5.6: State Agency Buy Recycled Campaign FY 19/20 Performance

Product Category	SABRC Reportable Dollars	SABRC Compliant Dollars	% SABRC Compliant
Antifreeze	0.00	0.00	0%
Compost and Mulch	$2,882.25	$2,882.25	100%
Glass Products	$28,901.33	$23,038.34	79.71%
Lubricating Oils	$272,240.69	$4,500.18	1.65%
Paint	$192,600.54	$12,959.25	6.73%
Paper Products	$2,908,044.26	$2,070,871.37	71.21%
Plastic Products	$1,431,127.34	$411,357.65	28.74%
Printing and Writing Paper	$13,219,612.60	$11,770,753.19	89.04%
Metal Products	$6,919,145.49	$2,440,152.58	35.27%
Tire Derived Products	$3,801.27	$3,219.77	84.70%
Tires	$361,443.19	0.00	0%

Efforts to increase non-compliant SABRC categories have been challenging. Our research to increase our Tire category have concluded that statewide contracts exclude retreaded tires. For Category 5 (Oil), there are challenges in obtaining accurate data as there is no mechanism in place to track recycled content information from vendors, so zero compliant dollars are reported. For Category 9 (Tires), the compliant dollars are low because all four retreading facilities in California cater to semis, tractors and farming equipment; retreaded passenger tires are not available. The deficient compliance percentage in Category 6 (Plastic) is due to large emergency COVID-19 orders including face shields and body bags. Without Emergency purchases, Category 6 would be compliant. In Category 7 (Paint), the deficient compliance percentage is due to two large purchases of non-compliant paint via a Leveraged Procurement Agreement. While there were 25 total purchases in the category, the two largest purchases make up 87% of the dollars spent. Without those two purchases, Category 7 would be compliant. In Category 11 (Metal), the majority of reportable dollars are for modular furniture through CAL PIA, which does not meet SABRC post-consumer recycled content thresholds. The State Contracting Manual, Volume FI$Cal, requires that priority is given to procuring from CAL PIA when possible before allowing the use of other vendors. Without these CAL PIA purchases, Category 11 would be over 62% SABRC compliant.

DGS will look for other alternatives for non-compliant areas. In bringing SABRC awareness to the highest level of the department DGS has consistently shared the annual departmental SABRC report at the OBAS Contracts Governance Council which is attended by the department's deputy directors.

Note for 5.7: Below are the top five commodities OBAS has focused its efforts on to increase environmentally preferable procurement. OBAS commitment to increase EPP spend each year is demonstrated by the positive results this year. Our efforts have

resulted in the maintaining or increasing the percentage of EPP spend in all 5 commodities. The biggest percentage increase identified was in Lighting, reporting 76% EPP spend this year compared to 48% last year. OBAS continues to do well in the paper commodities. The printing, copy & writing increased 28% from 61% last year to 89% this year. Although total spend dollars on toilet paper was reduced, the percentage of EPP spend remained about the same from 83% last year to 82% this year. The most significant effort and accomplishment was the increase in total spend dollars in trash liners. The spend increased over $180,000 from last year and OBAS maintained the EPP spend at 100%, for no change in EPP Target %. OBAS attributes these positive efforts and accomplishments to having DGS Statewide contracts available for these commodities as well as the Team awareness to utilize those contracts.

The Green Buyer website tracks and offers transparency in agencies performance for buying EPP goods. EPP goods are those identified as EPP when entered into SCPRS. These goods are available from statewide contracts or compliant with DGS Purchasing Standards or SABRC. EPP goods are categorized by UNSPSC and compared with goods of the same category to establish the percent EPP spend as reported in SCPRS. EPP goods are found on DGS Buying Green website.

Table 5.7: Commodities categories with the greatest Potential to Green

Commodity	2020 Total Spend ($)	2020 Percent EPP Spend (%)	EPP Target (%)
Printing, Copy and Writing Paper	$13,219,613	$11, 770, 753	89%
Lights	$24,411	$18,516	76%
Toilet Paper	$373,109	$305,914	82%
Ink/ink Cartridges	$78,096	$24,039	31%
Trash Liners	$216,489	$216,489	100%

Sustainability Development and Education

Below are DGS Office of Business Services efforts to promote the understanding and advancement of sustainable procurement within DGS and to external suppliers.

- OBAS incorporates EPP language into service contracts and continue to develop further language to expand to various services. We do have EPP requirements and language incorporated into our construction contracts project manuals. We will continue incorporate this process and will look how to update where applicable. OBAS will continue to utilize PD's statewide commodity contracts which already have EPP requirements included.
- Continued efforts to understand, communicate and align with the vision and direction of departmental stakeholders such as DGS Procurement Division and Office of Sustainability. Understanding the departments direction will open door to communicate with external stakeholders such as CalRecycle.
- Continue to network and partner with other department Sustainability Programs.

- OBAS does not have dedicated staff focus on departmental EPP efforts. OBAS has assigned specific EPP task to multiple staff. A manager has been assigned to oversee the development of a sustainable purchasing program within DGS. As EPP comes to the forefront of statewide procurements additional focus will be needed to enhance the development of the EPP departmental program.
- As the program grows, there may be potential to dedicate staff or a team to continue the sustainable purchasing program's efforts.
- An OBAS mandatory training requirement is to attend and complete the DGS Procurement Division's EPP training within the first 6 months of onboarding.

Table 5.8 below identifies the total number of buyers by CalHR classification within OBAS as well as how many procurement staff within each classification who have completed EPP training through California Procurement and Contract Academy (CALPCA). OBAS is committed to support and encourage EPP initiatives.

Total Number of Employees Assigned as Buyers: **49**

Table 5.8: Buyers who have completed EPP Training

CalHR Classification	Total Number of Buyers	Percent Completing EPP Training	Commitment to have buyers complete EPP training (%)
Office Technician	0	0	0%
Staff Services Analyst	14	42%	100%
Associate Governmental Program Analyst	35	89%	100%

DGS believes in investing in our staff. We encourage Acquisition Analyst to attend and participate in trainings that will further develop their procurement skills and bring awareness of state economic, environmental and social procurement programs offered through the state.

Additional required training apart from EPP training includes but is not limited to:

- CalPCA Basic Acquisition Certificate (BAC)
- OBAS Basic Training, SB/DVBE Option
- Statement of Work Part 1 and 2

Additional trainings include:

- Contract Management
- Non-Competitive Bid Acquisitions

Location Efficiency

Location efficiency refers to the effect of a facility's location on travel behavior and the environmental, health and community impacts of that travel behavior, including emissions from vehicles. Locating department facilities in location-efficient areas reduces air emissions from state employees and users of the facilities; contributes to the revitalization of California's downtowns and town centers, helps the department compete for a future workforce that prefers walkable, bikeable and transit-accessible worksites; and aligns department operations with California's planning priorities.

Our department's goal is that the average location efficiency score for all new leases be 10% higher than our average as of January 1, 2017.

DGS' Real Estate Leasing and Planning Section (RELPS) introduced this process to give all clients the ability to track the location efficiency scores for their portfolio. When we present the possible sites found in the market for new space lease facilities, we include the building location efficiency score in the site search packet. This gives the client the ability to compare it to their current score and others they will be looking at in the marketplace. This becomes a factor and helps them make appropriate decisions on what is the best space for their needs. While RELPS leasing created the inclusion of the scores on all new site searches, it is the responsibility of the individual agency or department to track scores for their portfolio. DGS incorporated these changes into our process in 2017.

RELPS has completed 900-1,100 new space leases since 2017; some examples are listed below.

Table 5.9 Lists all new executed DGS leases that began site search after January 1, 2017

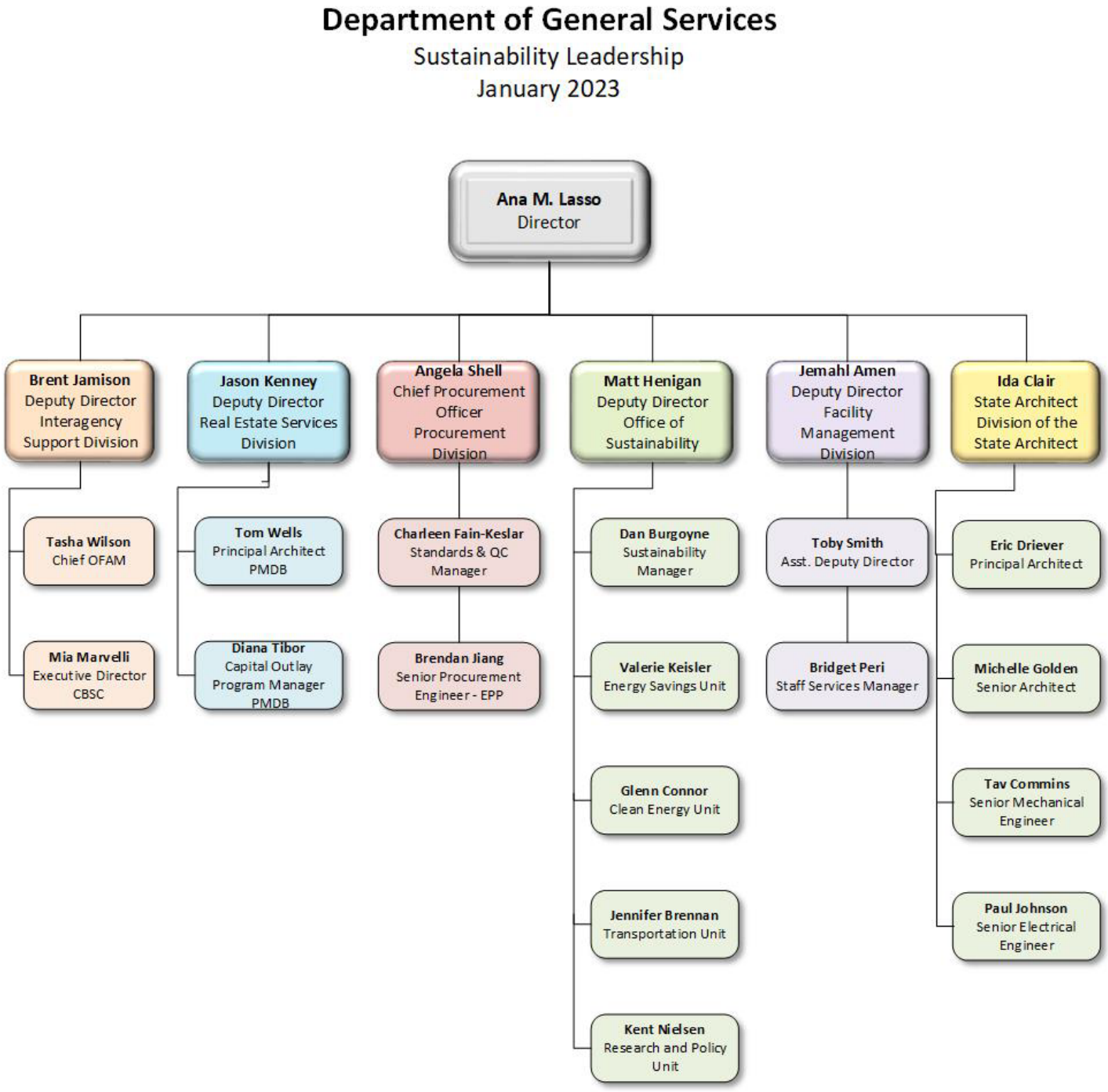
Table 5.9: Smart Location Score for new Leases

Facility name	Smart Location Calculator Score
355 S Grand Avenue, Los Angeles	43
28454 Livingston Ave, Valencia	3
2 Macarthur Place, Santa Ana	5
1716 Third Street, Sacramento	66
400 R Street, Sacramento	58
6020 Foodlink Street, Sacramento	9
402 W Broadway, San Diego	92
885 Riverside Parkway, West Sacramento	1
1000 Riverside Parkway, West Sacramento	2
Average	31
Baseline Prior to 2017	34
% change from Baseline	-10%

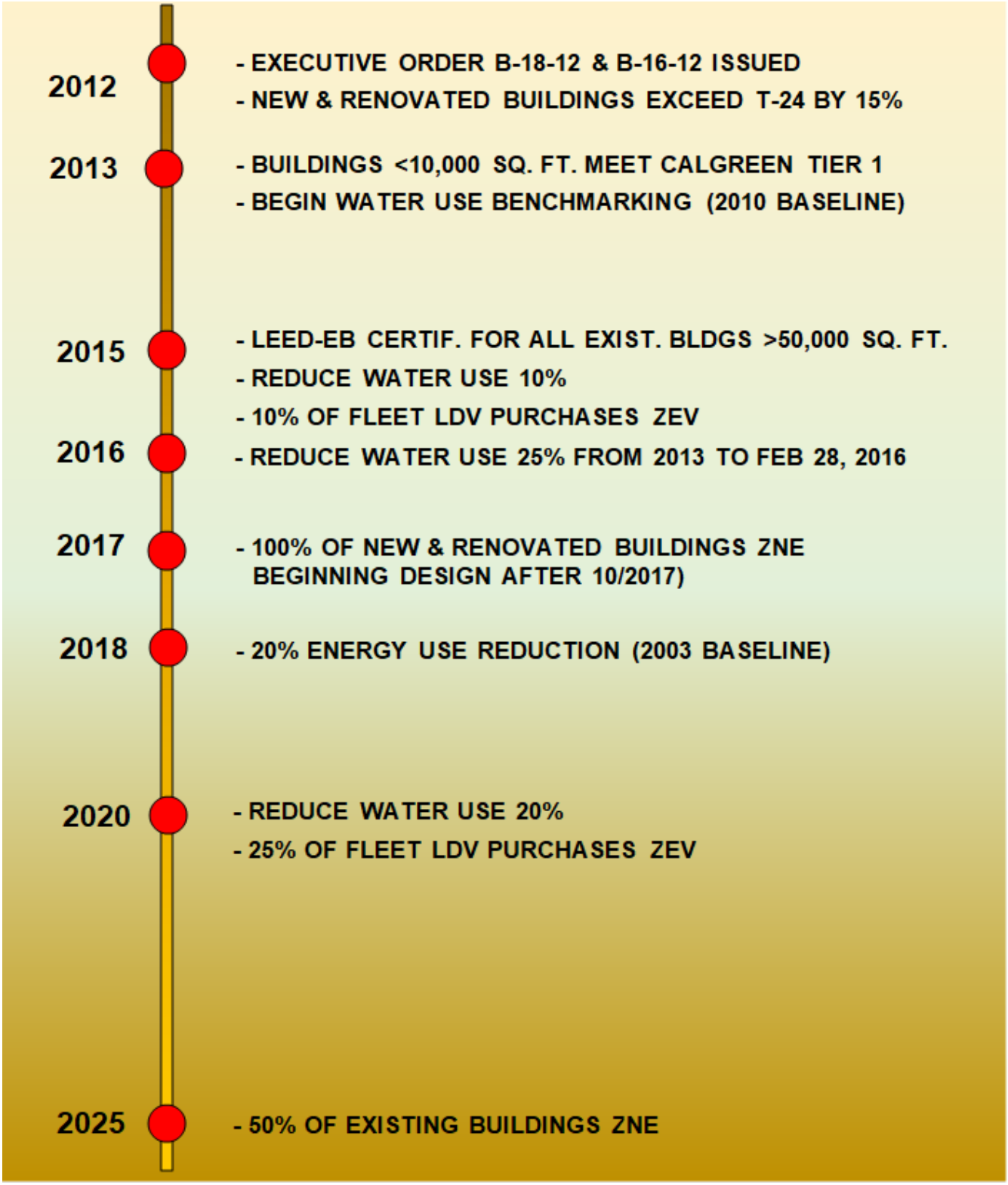
Table 5.10: Lowest Smart Location Score Leases

Facility name	Smart Location Calculator Score
885 Riverside Parkway, West Sacramento	1
1000 Riverside Parkway, West Sacramento	2
28454 Livingston Ave, Valencia	3

Appendix A – Sustainability Leadership



Appendix B - Sustainability Milestones & Timeline



Appendix C – Acronyms

AB	Assembly Bill
ADR	Automated Demand Response
AMB	Asset Management Branch (at DGS)
BMP	Best management practices
CA	California
CALGREEN	California Green Building Code (Title 24, Part 11)
CEC	California Energy Commission
DGS	Department of General Services
DWR	Department of Water Resources
EHT	Extreme heat threshold
EMS	Energy management system (aka EMCS)
EMCS	Energy management control system (aka EMS)
EO	Executive Order
EPP	Environmentally preferable purchasing
ESCO	Energy service company
ESPM	Energy Star Portfolio Manager
ETS	Enterprise Technology Solutions (a division at DGS)
EUI	Energy use intensity (source kBTU/sq. ft.)
EVSE	Electric vehicle supply equipment (charging equipment)
FMD	Facilities Management Division (a division at DGS)
GCM	Global circulation model
GHG	Greenhouse gas
GHGe	Greenhouse gas emissions
GSP	Groundwater Sustainability Plan
IEQ	Indoor environmental quality
kBTU	Thousand British thermal units (unit of energy)
LCM	The Landscape Coefficient Method
LEED	Leadership in Energy and Environmental Design
MAWA	Maximum applied water allowance

MM	Management Memo
MWELO	Model Water Efficient Landscape Ordinance
OBAS	Office of Business and Acquisition Services (at DGS)
OBF	On-bill financing
OFAM	Office of Fleet and Asset Management (at DGS)
OS	Office of Sustainability (at DGS)
PMDB	Project Management and Development Branch (at DGS)
PPA	Power purchase agreement
PUE	Power usage effectiveness
RCP	Representative Concentration Pathway
SABRC	State Agency Buy Recycled Campaign
SAM	State Administrative Manual
SB	Senate Bill
SCM	State Contracting Manual
SGA	Sustainable groundwater agency
SGMA	Sustainable Groundwater Management Act
WMC	Water management coordinator
WUCOLS	Water Use Classifications of Landscape Species
ZEV	Zero-emission vehicle
ZNE	Zero net energy

Appendix D - Glossary

Backflow - is the undesirable reversal of the flow of water or mixtures of water and other undesirable substances from any source (such as used water, industrial fluids, gasses, or any substance other than the intended potable water) into the distribution pipes of the potable water system.

Back flow prevention device – a device that prevents contaminants from entering the potable water system in the event of back pressure or back siphonage.

Blowdown - is the periodic or continuous removal of water from a boiler to remove accumulated dissolved solids and/or sludge. Proper control of blowdown is critical to boiler operation. Insufficient blowdown may lead to deposits or carryover. Excessive blowdown wastes water, energy, and chemicals.

Compost – Compost is the product resulting from the controlled biological decomposition of organic material from a feedstock into a stable, humus-like product that has many environmental benefits. Composting is a natural process that is managed to optimize the conditions for decomposing microbes to thrive. This generally involves providing air and moisture, and achieving sufficient temperatures to ensure weed seeds, invasive pests, and pathogens are destroyed. A wide range of material (feedstock) may be composted, such as yard trimmings, wood chips, vegetable scraps, paper products, manures and biosolids. Compost may be applied to the top of the soil or incorporated into the soil (tilling).

Critical overdraft - a condition in which significantly more water has been taken out of a groundwater basin than has been put in, either by natural recharge or by recharging basins. Critical overdraft leads to various undesirable conditions such as ground subsidence and saltwater intrusion.

Ecosystem services - are the direct and indirect contributions of ecosystems to human well-being. They support directly or indirectly our survival and quality of life. Ecosystem services can be categorized in four main types:

1. Provisioning services are the products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources and medicines.
2. Regulating services are the benefits obtained from the regulation of ecosystem processes such as climate regulation, natural hazard regulation, water purification and waste management, pollination or pest control.
3. Habitat services provide living places for all species and maintain the viability of gene-pools.
4. Cultural services include non-material benefits such as spiritual enrichment, intellectual development, recreation and aesthetic values.

Grass cycling -refers to an aerobic (requires air) method of handling grass clippings by leaving them on the lawn when mowing. Because grass consists largely of water (80% or more), contains little lignin and has high nitrogen content, grass

clippings easily break down during an aerobic process. Grass cycling returns the decomposed clippings to the soil within one to two weeks acting primarily as a fertilizer supplement and, to a much smaller degree, mulch. Grass cycling can provide 15 to 20% or more of a lawn's yearly nitrogen requirements

Hydrozone – is a portion of a landscaped area having plants with similar water needs that are served by one irrigation valve or set of valves with the same schedule.

Landscape Coefficient Method (LCM) describes a method of estimating irrigation needs of landscape plantings in California. It is intended as a guide for landscape professionals.

Landscape water budget - is the calculated irrigation requirement of a landscape based on landscape area, local climate factors, specific plant requirements and the irrigation system performance.

Model Water Efficient Landscape Ordinance (MWELO) - The Water Conservation in Landscaping Act was signed into law on September 29, 1990. The premise was that landscape design, installation, and maintenance can and should be water efficient. Some of the provisions specified in the statute included plant selection and groupings of plants based on water needs and climatic, geological or topographical conditions, efficient irrigation systems, practices that foster long term water conservation and routine repair and maintenance of irrigation systems. DWR adopted the Model Ordinance in June of 1992. One element of the Model Ordinance was a landscape water budget. In the water budget approach, a Maximum Applied Water Allowance (MAWA) was established based on the landscape area and the climate where the landscape is located. The latest update to MWELO was in 2015. MWELO applies to all state agencies' landscaping.

Mulch – Mulch is a layer of material applied on top of soil. Examples of material that can be used as mulch include wood chips, grass clippings, leaves, straw, cardboard, newspaper, rocks, and even shredded tires. Benefits of applying mulch include reducing erosion and weeds and increasing water retention and soil vitality. Whenever possible, look for mulch that has been through a sanitization process to kill weed seeds and pests.

Trickle flow – A device that allows users to reduce flow to a trickle while using soap and shampoo. When the device is switched off, the flow is reinstated with the temperature and pressure resumes to previous settings.

Sprinkler system backflow prevention devices – are devices to prevent contaminants from entering water supplies. These devices connect to the sprinkler system and are an important safety feature. They are required by the California Plumbing Code.

Submeter- a metering device installed to measure water use in a specific area or for a specific purpose. Also known as dedicated meters, landscape submeters are effective for separating landscape water use from interior water use, evaluating the landscape water budget and for leak detection within the irrigation system.

Water Budget - A landscape water budget is the calculated irrigation requirement of a landscape based on landscape area, local climate factors, specific plant requirements and the irrigation system performance.

Water-energy nexus - Water and energy are often managed separately despite the important links between the two. 12 percent of California's energy use is related to water use with nearly 10 percent being used at the end water use. Water is used in the production of nearly every major energy source. Likewise, energy is used in multiple ways and at multiple steps in water delivery and treatment systems as well as wastewater collection and treatment.

Water Shortage Contingency Plans - each urban water purveyor serving more than 3,000 connections or 3,000 acre-feet of water annually must have an Urban Water Shortage Contingency Plan (Water Shortage Plan) which details how a community would react to a reduction in water supply of up to 50% for droughts lasting up to three years.

Appendix E – Department Stakeholders

List individuals, offices, and divisions responsible for leading efforts related to each initiative identified in this report. Include their respective titles, roles, responsibilities.

Climate Change Adaptation

Understanding Climate Risk at Existing Facilities	
OS	Matt Henigan, Deputy Director, Sustainability Dan Burgoyne, Project Director

Understanding Climate Risk at Planned Facilities	
PMDB	Jason Kenney, Deputy Director, Real Estate Services Division Tom Wells, Principal Architect

Integrating Climate Change into Department Planning and Funding Programs	
PMDB	Jason Kenney, Deputy Director, Real Estate Services Division Tom Wells, Principal Architect

Measuring and Tracking Progress	
PMDB	Jason Kenney, Deputy Director, Real Estate Services Division Tom Wells, Principal Architect
OS	Matt Henigan, Deputy Director, Sustainability Dan Burgoyne, Project Director

Zero Emission Vehicles

Incorporating ZEVs Into the Department Fleet	
OFAM	Tasha Wilson, Chief Brent Jamison, Deputy Director, Interagency Support Division

Telematics	
OFAM	Tasha Wilson, Chief Brent Jamison, Deputy Director, Interagency Support Division

Public Safety Exemption	
N/A	N/A

Outside Funding Sources for ZEV Infrastructure	
OS	Jennifer Brennan, Transportation Manager

Hydrogen Fueling Infrastructure	
OFAM	Tasha Wilson, Chief Brent Jamison, Deputy Director, Interagency Support Division

Comprehensive Facility Site and Infrastructure Assessments	
OS	Jennifer Brennan, Transportation Manager

EVSE Construction Plan	
OS	Jennifer Brennan, Transportation Manager

EVSE Operation	
OFAM	Tasha Wilson, Chief Brent Jamison, Deputy Director, Interagency Support Division

Energy

Zero Net Energy (ZNE)	
OS	Matt Henigan, Deputy Director, Sustainability Dan Burgoyne, Project Director, Zero Net Energy Program Manager, policy development and ZNE strategy support for DGS and state agencies
PMDB	Jason Kenney, Deputy Director, Real Estate Services Division Tom Wells, Principal Architect in charge of Sustainability Design Implementation, ZNE design of new projects Shelly Whitaker, Capital Outlay Program Manager in charge of Sustainability Project Management Implementation
FMD	Herby Lissade, Acting as Deputy Director, Facilities Management Division, responsible for ZNE in half of existing building portfolio area

New Construction Exceeds Title 24 by 15%	
PMDB	Jason Kenney, Deputy Director, Real Estate Services Division Tom Wells, Principal Architect in charge of Sustainability Design Implementation Shelly Whitaker, Capital Outlay Program Manager in charge of Sustainability Project Management Implementation

Reduce Grid-Based Energy Purchased by 20% by 2018	
FMD	Herby Lissade, Acting as Deputy Director, Facilities Management Division

Server Room Energy Use	
ETS	Gary Renslo, Chief Information Officer

Demand Response	
FMD	Herby Lissade, Acting as Deputy Director, Facilities Management Division

Renewable Energy	
OS	Matt Henigan, Deputy Director, Sustainability Glenn Connor, Clean Energy Program Manager

Monitoring Based Commissioning (MBCx)	
OS	Valerie Keisler, Energy Savings Program Manager Sergey Makarenko, Project Director II

Financing	
OS	Matt Henigan, Deputy Director, Sustainability Valerie Keisler, Energy Savings Program Manager

Water Efficiency and Conservation

Indoor Water Efficiency Projects In Progress First initiative	
FMD	Kathy Park, Associate Landscape Architect Herby Lissade, Acting as Deputy Director, Facilities Management Division

Boilers and Cooling Systems Projects In Progress	
FMD	Herby Lissade, Acting as Deputy Director, Facilities Management Division

Landscaping Hardware Water Efficiency Projects In Progress	
FMD	Kathy Park, Associate Landscape Architect Herby Lissade, Acting as Deputy Director, Facilities Management Division

Living Landscaping Water Efficiency Projects In Progress	
FMD	Kathy Park, Associate Landscape Architect Herby Lissade, Acting as Deputy Director, Facilities Management Division

Buildings with Urban Water Shortage Contingency Plans In Progress	
FMD	Kathy Park, Associate Landscape Architect Herby Lissade, Acting as Deputy Director, Facilities Management Division

Green Operations

Greenhouse Gas Emissions	
OS FMD	Matt Henigan, Deputy Director, Sustainability Dan Burgoyne, Program Manager Michael Cripps, Staff Services Analyst

Building Design and Construction	
PMDB	Jason Kenney, Deputy Director, Real Estate Services Division Tom Wells, Principal Architect

LEED for Existing Buildings Operations and Maintenance	
OS FMD	Dan Burgoyne, Program Manager Bridget Peri, Sustainability Project Lead

Indoor Environmental Quality	
FMD	Bridget Peri, Sustainability Project Lead

Integrated Pest Management	
FMD	Bridget Peri, Sustainability Project Lead

Waste Management and Recycling	
FMD	Bridget Peri, Sustainability Project Lead

Environmentally Preferable Purchasing	
OBAS	Jaime Tovar, Staff Services Manager II

Location Efficiency	
AMB	Patrick Foster, Assistant Branch Chief, Asset Management

Appendix F – Sustainability Requirements & Goals

State Executive Orders have directed California state agencies to demonstrate sustainable operations and to lead the way by implementing sustainability policies set by the state. Additionally, enacted legislation includes sustainability-related requirements of state facilities and operations. Specific references and background on executive orders, legislation, management memos and other requirements or actions are included in five general chapters within this roadmap, as follows:

Climate change adaptation

Zero-emission vehicles

Energy

Water efficiency and conservation

Green operations

These general sustainability initiatives include the following:

- GHG emissions reductions
- Climate change adaptation
- Building energy efficiency and conservation
- Indoor environmental quality (IEQ)
- Water efficiency and conservation
- Monitoring-based Building Commissioning (MBCx)
- Environmentally preferable purchasing (EPP)
- Financing for sustainability
- Zero-emission vehicle (ZEV) fleet purchases
- Electric vehicle charging infrastructure
- Monitoring and executive oversight
- Zero Net Energy (ZNE)

Appendix G – Sustainability Background References

The following executive orders, Management Memos, legislative actions, resources and guidance documents provide the sustainability criteria, requirements, and targets tracked and reported herein.

Executive Orders

The governor issued the following executive order relevant to chapters of this roadmap:

- **Executive Order B-16-12**
- EO B-16-12 directs state agencies to integrate zero-emission vehicles (ZEVs) into the state vehicle fleet. It also directs state agencies to develop the infrastructure to support increased public and private sector use of ZEVs. Specifically, it directs state agencies replacing fleet vehicles to replace at least 10 percent with ZEVs, and by 2020 to ensure at least 25 percent of replacement fleet vehicles are ZEVs.
- **Executive Order B-18-12**
- EO B-18-12 and the companion *Green Building Action Plan* require state agencies to reduce the environmental impacts of state operations by reducing greenhouse gas emissions, managing energy and water use, improving indoor air quality, generating on-site renewable energy when feasible, implementing environmentally preferable purchasing, and developing the infrastructure for electric vehicle charging stations at state facilities. The Green Building Action Plan also established two oversight groups – the staff-level Sustainability Working Group and the executive-level Sustainability Task Force – to ensure these measures are met. Agencies annually report current energy and water use into the Energy Star Portfolio Manager (ESPM).
- **Executive Order B-29-15**
- EO B-29-15 directs state agencies to take actions in response to the ongoing drought and to the state of emergency due to severe drought conditions proclaimed on January 17, 2014. Governor Brown directed numerous state agencies to develop new programs and regulations to mitigate the effects of the drought and required increased enforcement of water waste statewide. Agencies were instructed to reduce potable urban water use by 25 percent between 2013 and February 28, 2016.

- **Executive Order B-30-15**
- In 2015, the governor issued EO B-30-15, which declared climate change to be a "threat to the well-being, public health, natural resources, economy and environment of California." It established a new interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 and reaffirms California's intent to reduce GHG emissions to 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions. It also directs state agencies to take climate change into account in their planning and investment decisions and employ life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives. State agencies are directed to prioritize investments that both build climate preparedness and reduce GHG emissions; prioritize natural infrastructure; and protect the state's most vulnerable populations.
- **Executive Order B-37-16**
- EO B-37-16 builds on what were formerly temporary statewide emergency water restrictions in order to establish longer-term water conservation measures, including permanent monthly water use reporting; new permanent water use standards in California communities; and bans on clearly wasteful practices such as hosing off sidewalks, driveways and other hardscapes. The EO focuses on using water more wisely and eliminating water waste by taking actions to minimize water system leaks. The California Department of Water Resources (DWR) estimates that leaks in water district distribution systems siphon away more than 700,000 acre-feet of water a year in California – enough to supply 1.4 million homes for a year.
- The EO further strengthens local drought resilience and looks to improve agricultural water use efficiency and drought planning. State agencies are to cooperate with urban water management plans, which include plans for droughts lasting for at least five years by assuring that the water efficiency and conservation plan has drought contingency actions.

State Administrative Manual & Management Memos

The following section of the State Administrative Manual (SAM), and associated Management Memos (MMs) currently impose sustainability requirements on the department under the governor's executive authority:

- **SAM Chapter 1800**: Energy and Sustainability
- **MM 14-02:** Water Efficiency and Conservation
- **MM 14-05**: Indoor Environmental Quality: New, Renovated, And Existing Buildings
- **MM 14-07**: Standard Operating Procedures for Energy Management in State Buildings
- **MM 14-09**: Energy Efficiency in Data Centers and Server Rooms
- **MM 15-03**: Minimum Fuel Economy Standards Policy
- **MM 15-04**: Energy Use Reduction for New, Existing, and Leased Buildings

- **MM 15-06**: State Buildings and Grounds Maintenance and Operation
- **MM 15-07**: Diesel, Biodiesel, and Renewable Hydrocarbon Diesel Bulk Fuel Purchases
- **MM 16-07**: Zero-Emission Vehicle Purchasing and EVSE Infrastructure Requirements
- **MM 17-04**: Zero Net Energy for New and Existing State Buildings

Legislative Actions

Several pieces of legislation were signed in 2015-16 that codified several elements of the executive orders, or provided further requirements included in the policies. These include the following:

- **Assembly Bill (AB) 1482** (Gordon, 2015): Requires that the California Natural Resources Agency (CNRA) update the state's adaptation strategy safeguarding California every three years. Directs state agencies to promote climate adaptation in planning decisions and ensure that state investments consider climate change impacts, as well as the use of natural systems and natural infrastructure. (Public Resources Code Section 71153)
- **Senate Bill (SB) 246** (Wieckowski, 2015): Established the Integrated Climate Adaptation and Resiliency Program within the Governor's Office of Planning and Research to coordinate regional and local efforts with state climate adaptation strategies to adapt to the impacts of climate change. (Public Resources Code Section 71354)
- **AB 2800** (Quirk, 2016): Requires state agencies to take the current and future impacts of climate change into planning, designing, building, operating, maintaining and investing in state infrastructure. CNRA will establish a Climate-Safe Infrastructure Working Group to determine how to integrate climate change impacts into state infrastructure engineering. (Public Resources Code Section 71155)
- **Assembly Bill (AB) 4**: Passed in 1989. The State Agency Buy Recycled Campaign (SABRC) statutes are in Public Contract Code Section 12153-12217. The intent of SABRC is to stimulate markets for materials diverted by California local government and agencies. It requires state agencies to purchase enough recycled-content products to meet annual targets, report on purchases of recycled and nonrecycled products, and submit plans for meeting the annual goals for purchasing recycled-content products.
- **AB 32 Scoping Plan**: The scoping plan assumes widespread electrification of the transportation sector as a critical component of every scenario that leads to the mandated 40 percent reduction in GHG by 2030 and 80% reduction by 2045.
- **AB 2583** (Blumenfield 2012) **Public Resources Code §25722.8**: Statute requires reducing consumption of petroleum products by the state fleet compared to a 2003 baseline. Mandates a 10 percent reduction or displacement by Jan. 1, 2012 and a 20 percent reduction or displacement by Jan. 1, 2020.

- **AB 75** – Implement an integrated waste management program and achieve 50 percent disposal reduction target. State Agencies report annually on waste management program
- **SB 1106** – Have at least one designated waste management coordinator. Report annually on how your designated waste and recycling coordinator meets the requirement.
- **AB 2812** - Provide adequate receptacles, signage, education, staffing, and arrange for recycling services. Report annually on how each of these is being implemented
- **AB 341** – Implement mandatory commercial recycling program (if meet threshold). Report annually on recycling program
- **AB 1826** – Implement mandatory commercial organics recycling program (if meet threshold). Report annually on organics recycling program
- **SB 1383** - 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020, a 75 percent reduction by 2025, and 20 percent of currently disposed edible food is recovered for human consumption by 2025.
    - Agencies already in compliance with AB 1826 may need to further expand their organic waste recycling service to comply with the new requirements
    - Jan. 1, 2024, Tier 2 Commercial Edible food Generators will be required to donate edible food to a recovery organization.
- **SB 1335** - requires food service facilities located in a state-owned facility, a concessionaire on state-owned property, or under contract to dispense prepared food using reusable, recyclable, or compostable. food service packaging

Action Plan

- **2016 Zero-Emission Vehicle Action Plan**

  The plan establishes a goal to provide electric vehicle charging to 5 percent of state-owned parking spaces by 2022. It also advances the ZEV procurement target to 50 percent of light-duty vehicles by 2025.

State Resources and Guidance Documents

California has invested significant resources in understanding the risks of climate change, water efficiency, strategic growth, and state actions available to respond to and reduce these risks. These include the following:

- **Safeguarding California**: The state's climate adaptation strategy organized by sector. Each sector identifies risks from climate change and actions to reduce those risks.
- **Safeguarding California Implementation Action Plans**: Directed under EO B-30-15, the Implementation Action Plans outline the steps that will be taken in each sector to reduce risks from climate change.
- **Planning and Investing for a Resilient California**: Prepared under direction of EO B-30-15, this document provides a framework for state agencies to integrate climate change into planning and investment, including guidance on data selection and analytical approach.
- **California's Climate Change Assessments**: California has completed three comprehensive assessments of climate change impacts on California. Each assessment has included development of projections of climate impacts on a scale that is relevant to state planning (i.e., downscaled climate projections). These data are available through **Cal-Adapt**, an online data visualization and access tool.
- **Water Use Reduction Guidelines and Criteria**: Issued by the California Department of Water Resources February 28, 2013, pursuant to Executive Order B-18-12. Each applicable agency was required to take actions to reduce water use in facilities and landscapes that are operated by the state, including owned, funded or leased facilities. State-operated facilities are defined as facilities where the agency has direct control of the buildings' function, maintenance and repair. For leased facilities, the Green Building Action Plan directed at that time that new and renegotiated leases include provisions for water conservation, reporting water use, and installation of sub-meters to the extent possible and economically feasible.
- **Strategic Growth Council (SGC) Resolution on Location Efficiency:**
  Location efficiency refers to the greenhouse gas emissions arising from the transportation choices of employees and visitors to a building as determined by the Smart Location Calculator. Adopted on December 6, 2016, the resolution directs members of the SGC to achieve a 10 percent improvement in the Smart Location Score of new leases compared to 2016 average leased facilities score.

Table G-1: Background References and Applicable Roadmap Chapters

Background References	Climate Adaptation	ZEV	Energy	Water	Green Operations
Executive Orders:					
EO B-16-12		X			X
EO B-18-12		X	X	X	X
EO B-29-15				X	
EO B-30-15	X	X	X		X
EO B-37-16				X	
Management Memos					
MM 14-02				X	
MM 14-05			X		X
MM 14-07			X		X
MM 14-09			X		
MM 15-03		X	X		
MM 15-04			X		X
MM 15-06			X	X	X
MM 15-07		X			
MM 16-07		X			
MM 17-04			X		
Legislative Actions					
SB 246	X				
SB 2800	X				
SB 1106					X
SB 1383					X
AB 4					X
AB 32		X			X
AB 75					X
AB 341					X
AB 1826					X
AB 2812					X
AB 1482	X				
Action Plans					
2016 ZEV Action Plan		X			
State Resources and Guidance Documents					
Cal-Adapt	X				
California's Climate Change Assessments	X				
Public Resources Code §25722.8		X			
Planning and Investing for a Resilient California	X				

Safeguarding California	**X**				
Safeguarding CA Implementation Action Plan	**X**				
Sustainable Groundwater Management Act of 2014				**X**	

Appendix H - List of Tables & Graphs