Sustainability Roadmap 2020-2021

Department of State Hospitals

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

Department of State Hospitals

Gavin Newsom, Governor

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DEPARTMENT OF STATE HOSPITALS

Sustainability Road Map 2020-2021

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Executive Summary

The Department of State Hospitals (DSH) is pleased to present the department's "2020-2021 Sustainability Roadmap" which details DSH's performance in meeting the objectives of Executive Orders (EOs) B-29-15, B-18-12, and B-30-15 during calendar year 2020, as well as the actions DSH is taking to continuously lessen environmental impacts and achieve operational excellence.

DSH manages the nation's largest inpatient forensic mental health hospital system. Its mission is to provide evaluation and treatment in a safe and responsible manner, by leading innovation and excellence across a continuum of care and settings. DSH is responsible for the daily care and provision of mental health treatment of its patients. DSH oversees five state hospitals and has a Headquarters location in Sacramento, and employs nearly 13,000 staff.

- DSH-Atascadero opened in 1954 and resides on California's Central Coast in San Luis Obispo County.
- DSH-Coalinga opened in 2005 and is in Fresno County.
- DSH-Metropolitan opened in 1965 and is in the city of Norwalk in Los Angeles County.
- DSH-Napa, which opened in 1875, resides in Napa County.
- DSH-Patton facility opened in 1893 and is in San Bernardino County.

These five state hospitals collectively encompass 832 buildings, comprising of more than 6.6 million gross square feet of space on 2,600 acres of land.

Additionally, DSH provides services in jail-based competency treatment (JBCT) programs and conditional release (CONREP) programs throughout 58 counties. In FY 2019-20, DSH served 10,962 patients within state hospitals and jail-based facilities, with an average daily census of 6,143 and 333 respectively. The CONREP program maintains an average daily census of approximately 650.

Much of DSH's infrastructure is more than 60 years old and maintenance programs address the servicing, repairs, and upgrades needed to sustain building systems, structures, and grounds. Additionally, DSH has made capital improvements to its aging buildings over time including seismic retrofits, security improvements, fire-life-safety upgrades, infrastructure replacement, energy savings retrofits, solar photovoltaic (PV) system installations, and a limited number of new construction projects.

Climate adaptation is a crucial component to DSH's sustainability roadmap, not only in patient care since room temperatures above 78–80 degrees Fahrenheit may adversely affect patients on psychotic drugs, but also to campus hospitals statewide as wildfire threats are increasingly becoming more common. Projects such as Energy Savings Company (ESCO) energy retrofits, the installation of cool roofs and Heating, Ventilation and Air Condition (HVAC) upgrades all aim to maintain a safe internal temperature for patients and maintaining firebreaks around the periphery of each hospital property will mitigate the threat of increased wildfires.

Incorporating Zero Emission Vehicle (ZEV) into the State Fleet is at the forefront of the state's goal of decreasing greenhouse gas. To meet these goals, the transition from traditional gasoline vehicles to ZEVs is well underway as DSH's fleet acquisition plan earmarks the replacement of a multitude of light, medium and heavy-duty vehicles with ZEV vehicles. Furthermore, efficiency measures such as the successful installation of telematics aimed at maximizing the use of electric fuel and infrastructure upgrades such as the installation of electric vehicle chargers' hospital wide will assist DSH in meeting the States greenhouse gas goals.

DSH has implemented energy efficiency projects to reduce plug load and consumption at all five hospitals. Grid-based energy purchasing reduction has been achieved through the installation of LEDs, PV solar panels, and modernization of HVAC equipment in several buildings at its five hospitals. DSH has achieved some measurable savings in energy use by implementing conservation procedures and replacing HVAC equipment, which has now assisted the hospital in meeting the requirements of the Governor's Executive Order. Zero Net Energy is DSH's goal moving forward despite the challenges faced with maintaining aging facilities hospital wide.

The State of California is currently facing a severe drought. To confront this crisis at DSH, a campaign effort is underway to inform and educate patients and employees alike to reduce water use wherever possible. From a facilities perspective, several water saving measures are in place such as reducing water flow rates at all the buildings and outside grounds. Moving forward, DSH will continue to install water saving equipment hospital wide and have plans to design and install water recycling technologies.

DSH continues to make concerted efforts to reduce its green-house emissions such as new building construction (e.g. the new visitor center at DSH-Metropolitan).

While DSH has made many strides in advancing its sustainability initiatives, several factors that challenge the Department's ability to achieve energy efficiency and sustainability goals while preserving and reusing its existing buildings include:

- Aging buildings and infrastructure systems
- Historically significant buildings and/or districts
- Clinical/treatment best practices require modern and ligature-free facilities
- Resource constraints & prioritization of critical fire/life or health/safety projects

Despite these challenges, DSH successfully reduced energy consumption since 2010 by 39% and greenhouse gas emissions by 16% and has implemented renewable energy efforts through the commissioning of several solar, Electric Vehicle (EV) charging, and energy efficiency projects. DSH currently has three on-site solar PV plants generating 4.4 megawatts (MW) of power and three future solar PV plants are being planned that will generate approximately 7 MW of power. DSH is proactively investigating measures to mitigate the impacts of climate change at all locations and incorporating ESCO projects currently in progress at each of the five (5) state hospitals. Energy efficiency measures include interior and exterior lighting upgrades to LED, domestic water fixture improvements, refrigeration retrofits, HVAC replacements, converting evaporative coolers with air handling units, and replacing boiler equipment.

DSH's Sustainability Roadmap is a living document with scoring methodology that includes additional sustainability factors, impacts, and consequences due to climate change and extreme events. DSH is continuously integrating sustainability requirements into scope development used for deferred maintenance repairs, new facilities planning, and renovation projects for existing buildings. DSH has made progress towards achieving the requirements of the Executive Orders referenced in this document. Unless otherwise noted, this report outlines DSH's efforts achieved through December 2020 and planned through 2022.

Brent Houser

Brent Houser
Chief Deputy Director of Operations

Chapter 1 CLIMATE CHANGE ADAPTATION

DSH facilities are comprised of an aging infrastructure with some new construction or major renovation projects in progress or planned, pending the outcome from DSH's Infrastructure Master Plan (IMP). The IMP is in progress and anticipated to identify strategies to develop and/or modernize the infrastructure to support DSH's patient population.

DSH formed a team of sustainability coordinators with representation from each hospital to help champion climate change adaptation and to help formulate and implement DSH's sustainability policies and procedures. The team will be responsible for preparing and implementing DSH's statewide strategic sustainability goals.

Current Programs include:

- Indoor Water Efficiency and Environment Control
- Boiler and Cooling Systems Efficiency
- Landscaping Water Efficiency
- Statewide Water Management Plan
- Statewide Infrastructure Master Plan
- Green House Gas Emission Reduction

Understanding Climate Risk to Existing Facilities

According to Cal-Adapt, Table 1.1, DSH facilities are expecting an average increase of 8.2 degrees Fahrenheit in annual mean, maximum, and minimum temperatures from the period of 1961-1990 to 2070-2099. This calculation is derived by generating two separate averages: one from the 1961- 1990 time period and the other between the 2070-2099 time period. Utilizing these two averages, a single average of 8.2 Fahrenheit is generated. The temperature increase may have a variety of impacts on DSH facilities, such as increasing the need for air conditioning, use of vegetation for localized mitigation of the heat island effect, water shortages, or risk of power outages. In addition, temperature increases may also have a compounding effect such as escalating the frequency and duration of tropical storms and wildfires. These impacts pose significant implications and risk at DSH facilities. For example, many patients are prescribed psychotropic

medications which inhibit the body's ability to regulate its own temperature making patients potentially subject to serious side effects like heat-stroke. Health facilities treating patients with psychotropic drugs are required, by law, to maintain consistent interior building temperatures between 78–80 degrees Fahrenheit. Sustained interior temperatures beyond the required range could affect a patient's health.

To mitigate this risk and combat the impacts of climate change, ESCO energy retrofit projects are currently underway at all DSH hospitals. These projects are addressing the need to maintain the building interior temperature and include boiler burner replacement, converting existing air handling units to variable air volume, replacing fan motors with efficient rated motors, installing energy efficient transformers, updating the Buildings Automation System (BAS), performing commissioning, chiller replacement, and improving heat distribution.

Risk from Changing Extreme Temperatures

Under a changing climate, temperatures are expected to increase, both at the high and low end. As a result, facilities will experience higher maximum temperatures and increased minimum temperatures. In addition to changes in average temperatures, climate change will increase the number of extreme heat events across the State. Extreme events are already being experienced, and are likely to be experienced sooner than changes in average temperatures.

Table 1.1: Top 5-10 Facilities that Will Experience the Largest Increase in Extreme Heat Events

Facility Name	Extreme heat threshold (EHT) °F	Average # of days above EHT (1961-1990)	Average # of days above EHT (2031-2060)	Change from Historical to projected average # of days above EHT (2031-2060)	Avg. # days above EHT (2070-2099)	Change from historical to projected average # of days above EHT (2070-2099)
DSH-Atascadero	94	5	22	18	46	42
DSH-Coalinga	106	5	28	24	57	53
DSH-Metropolitan	98	4	12	7	27	22
DSH-Napa	99	5	12	8	22	18

DSH-Patton	102	4	29	24	51	46

Table 1.2a: Top 5-10 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)
DSH-Atascadero	71	76	4	79	8
DSH-Coalinga	78	83	5	86	8
DSH-Metropolitan	76	80	4	84	8
DSH-Napa	72	76	4	79	7
DSH-Patton	76	82	5	85	9

Table 1.2b: Top 5-10 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)
DSH-Atascadero	43	47	4	50	8
DSH-Coalinga	49	54	4	57	8
DSH-Metropolitan	54	59	4	62	8
DSH-Napa	46	50	4	54	8
DSH-Patton	49	54	5	58	9

DSH cooling operations will be impacted by this heat increase at each of the hospitals. Based on the projections, DSH-Patton will be most severely affected with an increase of 9 degrees Fahrenheit. To minimize heat and maintenance concerns, DSH-Patton installed a cool roof on the EB building and working drawings are in progress for buildings G, T, and U. Twelve additional statewide roof replacement projects, including HVAC upgrades, were initiated in FY 2020-21. A cool roof is designed to reflect more sunlight than a conventional roof, absorbing less solar energy. This lowers the temperature of the building. Conventional roofs

can reach temperatures of 150°F or more on a sunny summer afternoon. Under the same conditions, a reflective roof could stay more than 50°F (28 °C) cooler. This can save energy and money in buildings with air conditioning or improve comfort and safety in buildings without air conditioning, by reducing heat flow from the roof into the occupied space.

The adverse effect of extreme heat events could cause wildfires, power interruptions, extended shutdowns, or failure of building cooling systems. DSH has heat-contingency plans in place at the hospitals to minimize the impact and health risks to patients during extreme events.

DSH-Napa does not have air conditioning systems in several units across three patient housing buildings and relies on evaporative coolers. If the evaporative coolers are not functional, the indoor temperatures may rapidly increase and lead to an unsafe environment for patients and staff. Full replacement of evaporative coolers and air conditioning systems that are past their useful lives, with new centralized HVAC system for patient occupied buildings 195, 196, and 198 in the patient housing units is underway.

All hospitals have emergency diesel generators available. Currently, the emergency stand-by generators for DSH-Atascadero, DSH-Metropolitan, DSH-Napa, and DSH-Patton are old and incapable of sustaining current electrical load demands. Since the generators have insufficient capacity, DSH protocols require facilities to shed loads based on priority needs; patient living areas, treatment spaces, and staff occupied areas are the priority, then other uses. Most generators are not sized with enough capacity to continuously operate all HVAC units, which are essential to ensure that comfortable indoor temperatures are maintained for patients and staff.

DSH-Coalinga and DSH-Patton have the highest expected annual mean temperature of 83- and 82-degrees Fahrenheit, respectively. DSH-Patton is most vulnerable to temperature change because of its Urban Heat Island (UHI) value of 38,575. As open land and vegetation is replaced with buildings, roads, and other infrastructure, the formation of urban heat islands occurs where urban regions experience warmer temperatures as compared to their rural surroundings.

DSH-Patton's infrastructure is older than DSH-Coalinga's, however, both facilities maintain a 24 hours per day/7 days per week/365 days per year operation, with patients on psychotropic medication requiring constant comfortable indoor temperature levels ranging from 78-80 degrees Fahrenheit. DSH-Patton must

maintain adequate emergency power to keep all systems operating safely and continuously.

As part of the IMP, DSH is evaluating the existing electrical distribution systems for capacity, reliability, and efficiency. DSH ESCO projects will replace aging HVAC units and implement more energy efficient equipment and technology.

Figure 1- Atascadero Solar Array

Further, DSH goals for 2020-2021 aim to continuously improve the cooling and power reliability at all facilities and reduce the impact of seasonal heat waves by:

- Implementing energy efficiency measures campus-wide by replacing older existing roofs with new cool roofs
- Implementing the Statewide Water Management Plan to utilize water wisely using control measures and maintaining the water capabilities during critical events
- Developing the IMP to evaluate each of the five campuses, including utility infrastructure and generator capacity
- Installing statewide solar canopies as reflected in Figure 1
- Replacing outdated evaporating cooling systems with energy efficient HVAC units

Heating and Cooling Degree Days

A Heating Degree Day (HDD) is defined as the number of degrees by which a daily average temperature is below a reference temperature (i.e., a proxy for when heat would be needed). The reference temperature is typically 65 degrees Fahrenheit, although different utilities and planning entities sometimes use different reference temperatures. The reference temperature loosely 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 defined as the number of degrees by which a daily average temperature exceeds a reference temperature. The reference temperature is also typically 65 degrees Fahrenheit, and different utilities and planning entities sometimes use different reference temperatures. The reference temperature loosely represents an average daily temperature below which space cooling (e.g., air conditioning) is not needed.

Table 1.3: Top 5-10 Facilities that will be Most Impacted by Projected Changes in Heating and Cooling Degree Days (HDD/CDD)

Facility Name	Heating/Cooling Degree Days (1961-1990) (HDD/CDD)	Heating/Cooling Degree Days (2031-2060) (HDD/CDD)	Heating/Cooling Degree Days (2070-2099) (HDD/CDD)
DSH-Atascadero	71	76	79
DSH-Coalinga	78	83	86
DSH-Metropolitan	76	80	84
DSH-Napa	72	76	79
DSH-Patton	76	82	85

Urban Heat Islands

Urban heat islands (UHI) are areas with localized spikes in temperature, which impact human health, increase pollution, and increase energy demand. UHIs occur during the hot summer months in areas with higher percentages of impervious surface and less vegetation. This is likely in areas with large parking lots, dense development, and lower tree density and shading. UHIscan be mitigated (i.e., reduced) through tree planting and other greening measures, cool roofs (e.g., lighter roofing materials that reflect light), cooler pavements, and other measures.

Table 1.4: Facilities Located in Urban Heat Islands

Facility Name	Located in an Urban Heat Island[1] (yes/no)
DSH-Atascadero	No (Heat island index=0)
DSH-Coalinga	Yes (Heat island index=730)
DSH-Metropolitan	Yes (Heat island index=9,197)
DSH-Napa	No (Heat island index=352)
DSH-Patton	Yes (Heat island index=38,575)

DSH-Patton is assigned a significant heat island index value of 38,575, which makes it vulnerable to the impact of UHI effects. San Bernardino's high UHI value may signal that DSH-Patton is more vulnerable to urban heat affect than other facilities, which can affect the health of patients. To mitigate the effects of extreme heat, DSH utilizes cool roofs to reduce UHI when feasible.

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 will also result in decreased snowpack.

Table 1.5: Top 5-10 Facilities that will be Most Impacted by Projected Changes in Precipitation

[1] Urban heat island index ratings are found using the CalEPA established protocol and shown in Table 1.4.

Facility Name	Annual Mean Max. Precip. (1961–1990) (in/yr)	Annual Mean Precip. (2031–2060) (in/yr)	% change by mid-century	Annual Mean Precip. (2070–2099) (in/yr)	% change by end of century	Extreme Precip (1961-1990) (in/day)	Extreme Precip (2031-2060) (in/day)	Extreme Precip (2070-2090) (in/day)
DSH-Atascadero	24	27	16%	30	27%	7	7	9
DSH-Coalinga	7	8	12%	8	24%	2	2	3
DSH-Metropolitan	14	15	8%	16	19%	5	5	6
DSH-Napa	24	28	18%	31	32%	6	5	7
DSH-Patton	19	20	4%	21	11%	6	7	8

Table 1.5 identifies the anticipated precipitation impacts to DSH-Atascadero, DSH-Coalinga, DSH-Metropolitan, DSH-Napa, and DSH-Patton. As identified in the table, DSH-Atascadero and DSH-Napa present the highest forecasted increase in annual precipitation, whereas DSH-Coalinga, DSH-Metropolitan, and DSH-Patton demonstrate minimal anticipated changes in precipitation.

Large amounts of precipitation may result in flash floods, building flooding, and the damage or disabling of the utility infrastructure and emergency access roads. Most of DSH's facility infrastructures are a minimum of 60 years old, with the exception of DSH-Coalinga. The storm drainage systems at DSH-Atascadero, DSH-Napa, and DSH-Patton are currently being evaluated for future projects as there has been a history of flooding. DSH plans include diverting rainwater to open areas and growing additional landscape vegetation and trees to stabilize the soil, thus preventing flooding. However, drought conditions may impact DSH's ability to grow new landscape vegetation.

Higher precipitation could also result in damage to existing buildings. Server rooms, and rooms housing electrical distribution and mechanical equipment, are vulnerable to water damage. Most of the facilities' utilities (water, sewer, gas piping, chilled water, steam distribution) are constructed underground and services would be impacted and/or inaccessible due to flash flooding.

DSH's IMP will provide an analysis of existing conditions for utilities, roads, and buildings. The IMP will evaluate options to safeguard all server rooms and electrical/mechanical services at all facilities by providing increased flood mitigation measures and relocating critical utilities from below-grade and ground floor locations, where possible. Modifying the existing infrastructure is difficult as

most buildings were constructed using masonry, concrete, and/or concrete blocks. The IMP will consider these factors and provide a plan for improvements in reliability, building replacement, and population growth.

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.

The Guidance provides estimates of sea level rise for the California Coast for all active tide gauges based on a range of emission trajectories, which are based on the report, Rising Seas in California: An Update on Sea-Level Rise Science. This data provide projections for use in low, medium-high, and extreme risk aversion decisions. Current direction from the California Coastal Commission suggests using the medium-high risk aversion or extreme risk when assessing the vulnerability of critical infrastructure.

Table 1.6: All Facilities at Risk from Rising Sea Levels

Facility Name	Tide Chart Region	2050 Water Level (ft)	Exposed in 2050? (y/n)	2100 Water Level (ft)	Exposed at 2100? (y/n)
DSH-Atascadero	N/A	N/A	N/A	N/A	N/A
DSH-Coalinga	N/A	N/A	N/A	N/A	N/A
DSH-Metropolitan	N/A	N/A	N/A	N/A	N/A
DSH-Napa	N/A	N/A	N/A	N/A	N/A
DSH-Patton	N/A	N/A	N/A	N/A	N/A

Sea-level elevations of DSH's five facilities vary from 95 feet above sea level (DSH-Metropolitan) to 3,000 feet above sea level (DSH-Patton). Based on the current distances and elevations, no DSH facilities reside close enough to the ocean to be at risk from rising sea levels.

Risks from Wildfire

Wildfire is a serious hazard in California. Several studies have indicated that the risk of wildfire will increase with climate change and have recently amplified in duration and intensity. 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%.

Five of California's six largest fires all occurred in 2020 while 2017 and 2018 previously set records as the most destructive fire seasons in California's history. To start to understand how wildfire could affect DSH facilities, the data displayed in the table below provides an indication of current risk, based on CALFIRE data for Fire Hazard Severity Zones. This is presented as low, medium, high, or very high. For future risk, Table 1.8 uses data from Cal-Adapt to project acres that may be burned on or near DSH facilities.

Table 1.7: Facilities Most at risk to current wildfire threats

Facility Name	Fire Hazard Severity Zone (low, medium, high, very high)
DSH-Atascadero	Medium
DSH-Coalinga	Low
DSH-Metropolitan	Low
DSH-Napa	High
DSH-Patton	High

Table 1.8: 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)
DSH-Atascadero	12	14	13
DSH-Coalinga	0	0	0
DSH-Metropolitan	0	0	0
DSH-Napa	7	7	6
DSH-Patton	10	14	15

Per the CalOES fire risk maps,no DSH hospital facilities are located directly inside fire zones. However, both DSH-Atascadero and DSH-Napa specifically occupy areas susceptible to fires due to their open grassland and oak woodlands. However, the immediate area surrounding DSH-Napa is in a fire zone.

At DSH hospitals, the construction of the patient areas is mostly concrete, making the structures fire resistant. In some cases, peripheral buildings, structures, and

equipment are more vulnerable given their proximity to vacant land. They include, but are not limited to, the following:

- Water tanks
- Water wells
- Storage buildings and containers
- Guard towers
- Ground mounted photovoltaic systems

Plant Operations staff are fit-tested and issued N-95 masks for safety during smoke events. Also, at both DSH-Atascadero and DSH-Napa, there are substantial fire breaks separating the main facility from these areas.

Strategies implemented to combat the increased threat of wildfires include leasing land for agricultural use that keeps vegetation to a minimum, maintaining a firebreak around the facilities, removing dead trees, and clearing underbrush on a consistent basis.

If faced with a catastrophic wildfire event, the campus would require evacuation and the utilities would be shut down. Future structures would need to include fire resistant materials to ensure they do not burn during an event.

Summarizing Natural Infrastructure to Protect Existing Facilities

EO B-30-15 directs State agencies to prioritize the use of natural and green infrastructure solutions. Natural infrastructure is defined as 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)).

DSH is considering options to expand its natural infrastructure at all five facilities to help conserve power and mitigate High Heat Days (HHD). DSH utilizes recycled water at these locations to irrigate yards and lawns at two campuses, DSH-Metropolitan and Napa, that have vast green lawns, trees, and other landscape vegetation which need consistent irrigation to keep them healthy. The other three facilities have minimal or limited landscaped areas. Due to limited landscape, DSH-Atascadero relies on well water to irrigate campus fields. With minimally landscaped areas, DSH-Coalinga and DSH-Patton are planning to expand the

planting of water-wise landscape vegetation and trees to help mitigate HHD's. In addition, DSH is evaluating options to provide flood control strategies at DSH-Patton, which is necessary to keep the expanding natural environment intact during the rainy season.

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. DSH will continue to work with DGS and local communities when California Environmental Quality Act (CEQA) is required for projects to upgrade or construct facilities.

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 1.9: Facilities located in Disadvantaged Communities

Facility Name	CalEnviroScreen Score	Is it located in a disadvantaged community? Yes/No
DSH-Atascadero	12.87	
DSH-Coalinga	31.84	
DSH-Metropolita	60.50	s
DSH-Napa	20.12	No
DSH-Patton	51.24	

As shown above, DSH-Metropolitan resides in a disadvantaged area. Given the facility's central location within the city of Norwalk, it is a significant source of employment for local and surrounding communities. However, health services and/or other social services are not provided to the local community as DSH is mandated to only serve patients committed to DSH's inpatient mental health hospital system. DSH-Metropolitan has developed mutual aid agreements with

local city and county partners to provide assistance under specified circumstances. .

The department's priority will continue to be the well-being of its patients and staff in an emergency/traumatic event or during disaster situations. DSH's patients are housed in secured facilities. Mutual assistance and outreach following catastrophic events will be extended to the community, as conditions permit. DSH has limited resources which are directed to safeguard patients, staff, and facilities during and following a natural disaster or large-scale event.

Understanding Climate Risk to Planned Facilities

Tables 1.10a-g: Climate Risks to New Facilities

a.1

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)
DSH-Atascadero	71	76	4	79	8
DSH-Coalinga	78	83	5	86	8
DSH-Metropolitan	76	80	4	84	8
DSH-Napa	72	76	4	79	7
DSH-Patton	76	82	5	85	9

a.2

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)
DSH-Atascadero	43	47	4	50	8
DSH-Coalinga	49	54	4	57	8
DSH-Metropolitan	54	59	4	62	8
DSH-Napa	46	50	4	54	8
DSH-Patton	49	54	5	58	9

b.

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)
DSH-Atascadero	24	27	7	7
DSH-Coalinga	7	8	2	2
DSH-Metropolitan	14	15	5	5
DSH-Napa	24	28	6	5
DSH-Patton	19	20	6	7

c.

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
DSH-Atascadero	94	5	22	17
DSH-Coalinga	106	5	29	24
DSH-Metropolitan	98	4	11	7
DSH-Napa	99	5	12	7
DSH-Patton	102	4	29	25

d.

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
DSH-Atascadero	N/A	N/A	N/A	N/A	N/A
DSH-Coalinga	N/A	N/A	N/A	N/A	N/A
DSH-Metropolitan	N/A	N/A	N/A	N/A	N/A
DSH-Napa	N/A	N/A	N/A	N/A	N/A
DSH-Patton	N/A	N/A	N/A	N/A	N/A

e.

Facility Name	Current Fire Hazard Severity Zone (low, medium, high, very high)
DSH-Atascadero	Medium
DSH-Coalinga	Low
DSH-Metropolitan	Low
DSH-Napa	High
DSH-Patton	Medium

f.

Facility Name	Acres Burned (1961-1990)	Acres Burned (2031-2060)
DSH-Atascadero	12	14
DSH-Coalinga	0	0
DSH-Metropolitan	0	0
DSH-Napa	7	7
DSH-Patton	10	14

g.

Facility Name	Heating/Cooling Degree Days (1961-1990) (HDD/CDD)	Heating/Cooling Degree Days (2031-2060) (HDD/CDD)
DSH-Atascadero	71	76
DSH-Coalinga	78	83
DSH-Metropolitan	76	80
DSH-Napa	72	76
DSH-Patton	76	82

Table 1.11: 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)
DSH-Atascadero	No	No (Heat Island index=0)
DSH-Coalinga	No	Yes (Heat Island index=730)
DSH-Metropolitan	Yes	Yes (Heat Island index=9,197)
DSH-Napa	No	No (Heat Island index=352)
DSH-Patton	No	Yes (Heat Island index=38,575)

According to Senate Bill (SB) 535, DSH-Coalinga, DSH-Metropolitan, and DSH-Patton facilities fall into either a disadvantaged community or UHI, or both. DSH pursues Capital Outlay and Deferred Maintenance/Special Repairs projects at its facilities to keep older buildings operational. DSH is also implementing several fire/life/safety projects, energy-efficiency measures, and renewable energy projects to keep its buildings compliant and resource efficient.

According to Table 1.11, Patton is located within an UHI zone and efforts by DSH to mitigate UHI effects include the following projects:

- Replacement of older roofs with new cool roofs
- Upgrading and replacing HVAC systems
- Installing new chillers and air handlers

DSH's facilities are designed for a useful life of 50 years or more. The facilities most likely to be affected by climate change are DSH-Coalinga and DSH-Patton, with UHIs of 38,575 and 730 respectively, per Table 1.8. Negative impacts of extreme heat and higher UHI on buildings include the deterioration of the roofs and building operations, all of which would impact patients.

Extreme heat and higher UHI will impair DSH's ability to sustain comfortable indoor temperature within the patient occupied buildings and significantly increase the electrical demand of the hospital and need for a reliable emergency electrical infrastructure.

Natural Infrastructure

DSH facilities were developed over extensive periods of time and redevelopment will occur as in-fill projects in existing structures rather than the State acquiring new property. DSH will include natural infrastructure solutions as part of any renovation or new development planned for the sites. Identification and prioritization of new projects for natural and green infrastructure will follow DSH scoring procedures established for the Capital Outlay and Deferred Maintenance/Special Repairs projects.

Full Life Cycle Cost Accounting

EO B-30-15 directs State agencies to employ full Life Cycle Cost (LCC)accounting in all infrastructure investments. Lifecycle cost accounting includes:

- Consideration of initial investment costs, and lifetime operation and maintenance costs under changing climate conditions, including changing average conditions and increases in extreme events
- Application of non-market evaluation methods such as travel cost, avoided costs, or contingent valuation to capture hard to quantify benefits and costs

DSH plans to include LCC analysis using a systematic process, considering the initial environmental and energy impact associated with age, maintenance, disposal, or recycling cost. The next step is to consider the Facility Cost Index (FCI) as a benchmark through the IMP process, to compare the relative condition of deferred maintenance in all facilities from the output obtained from a computerized maintenance management system. This LCC is in progress statewide and will be the basis for new facility design and operation in the future.

Integrating Climate Change into Department Planning and Funding Programs

Table 1.12: 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?
Five Year- Capital Outlay Plan Infrastructure Master Plan Statewide Water Management Prioritization Scoring Criteria	Yes		Adaptation strategies are integrated in the scope of each Capital Outlay renovation, alteration, and betterment of existing structures, including scoring criteria used to prioritize deferred maintenance projects

Table 1.13: 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?
DSH Sustainability Road Map Five-year Capital Outlay Plan Infrastructure Master Plan	Yes	Yes	Yes

Table 1.14: Climate Change in Funding Programs for Exploration/Consideration

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?
State of California Water Conservation Grant State of California Energy Strategy and Support Program	Exploring opportunities			

Measuring and Tracking Progress

DSH facilities could be impacted by the following Climate Change Adaptation (CCA) events:

1. **Changing Temperature** (Table 1.6) - DSH facilities maintain a weather chart to help track daily temperature fluctuations, power variations, and power interruption notifications received from utility companies. This level of tracking enables the department to identify projects addressing facility needs to improve the reliability of DSH's infrastructure and vulnerable building systems.
2. **Largest Increase in Extreme Heat Events** (Table 1.6) - DSH-Metropolitan and DSH-Patton are expected to be significantly impacted by extreme heat events occurring in years 2031-60 and 2070-90. DSH-Coalinga will also be impacted due to extreme heat events, but not to the extent that DSH-Metropolitan and DSH-Patton will be affected.
3. **Urban Heat Island** (Table 1.10) - DSH-Patton resides within a high UHI and is also vulnerable to extreme heat events. DSH mitigation plans include replacing old roofs with new cool roofs to deflect damaging heat energy from buildings, adding a solar plant to reduce grid dependence, and changing air handling units to high efficiency units to maintain a comfortable indoor temperature in the range of 78-80 Fahrenheit for patients in the facility.

DSH has already incorporated climate change policies into infrastructure investments and projects. Milestones in the design and construction projects will be added to ensure that goals are met. DSH's Facilities Planning, Construction, and Management (FPCM) section is tasked with integrating the climate change adaptation plan into Capital Outlay and Deferred Maintenance/Special Repair projects. DSH has created a workgroup comprising of one representative from each hospital, which will meet monthly to review progress toward submitting sustainability progress reports and to recommend policies to achieve CCA goals. DSH Budget Packages (BP) and Studies will include natural and green infrastructure options in all future projects.

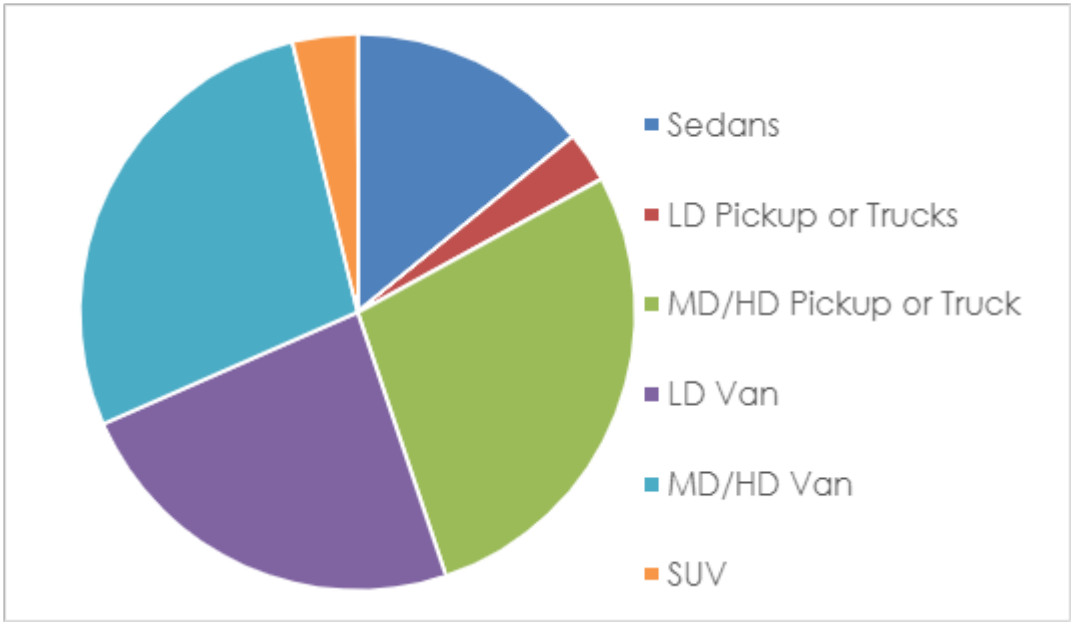
DSH's IMP will provide an analysis of existing conditions for utilities, roads, and buildings. The IMP will evaluate options to safeguard all server rooms and electrical/mechanical services at all facilities by providing increased flood mitigation measures and relocating critical utilities from below-grade and ground floor locations.

CHAPTER 2 – ZERO-EMISSION VEHICLES

Department Mission and Fleet

This Zero Emission Vehicle (ZEV) Report and Plan demonstrates 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 plans.

Graph 2.1: 2020 Composition of Vehicle Fleet



Light Duty Fleet Vehicles

DSH hospitals are open 24 hours per day, 7 days a week, 365 days per year. Service vehicles are utilized daily for a variety of needs, including but not limited to patient transports to off-site medical and court appointments. The majority of DSH's fleet assets are utilized for short trips within the facility or law enforcement patrol resulting in vast idle time and low mileage with a need for little major maintenance and repairs. DSH's Light-Duty statewide fleet consists of sedans, vans, pickup trucks, SUVs, electric carts, and pursuit-rated sedans/SUVs.

The typical usages for DSH's light-duty fleet assets include, but are not limited to, the following:

- Facility maintenance and operations
- Motor pool services
  - Food delivery
  - Laundry and patient property
  - Patient transportation to and from court and medical appointments
  - Staff transportation
- Hospital police services
  - First responders
  - Security patrol
  - Transport of patients to the local jail and court ordered appointments

DSH-Atascadero has many vehicles over 10 years old with under 36,000 miles of operation and significant hours of idle time. DSH-Atascadero vehicles are subject to asphalt, concrete, dirt roads, paved, and un-paved roadways during travel to the supply warehouse and throughout the agricultural lands.

DSH-Coalinga is located approximately halfway between Los Angeles and Sacramento in a remote rural area, making travel and transportation a key element to their operational success. Fleet vehicles encounter a variety of surfaces on-site including black top, concrete, dirt roads, asphalt, paved, and un-paved roadways.

DSH-Coalinga transports patients are transported in modified security fleet transportation vans for medical services and court appointments in outlying areas which exceed typical battery electric vehicle ranges of 60-80 miles per charge. SA hydrogen fueling station recently opened new opportunities for DSH-Coalinga to pursue fuel cell vehicles which offer a larger service range to meet business and operational needs for longer travel ranges.

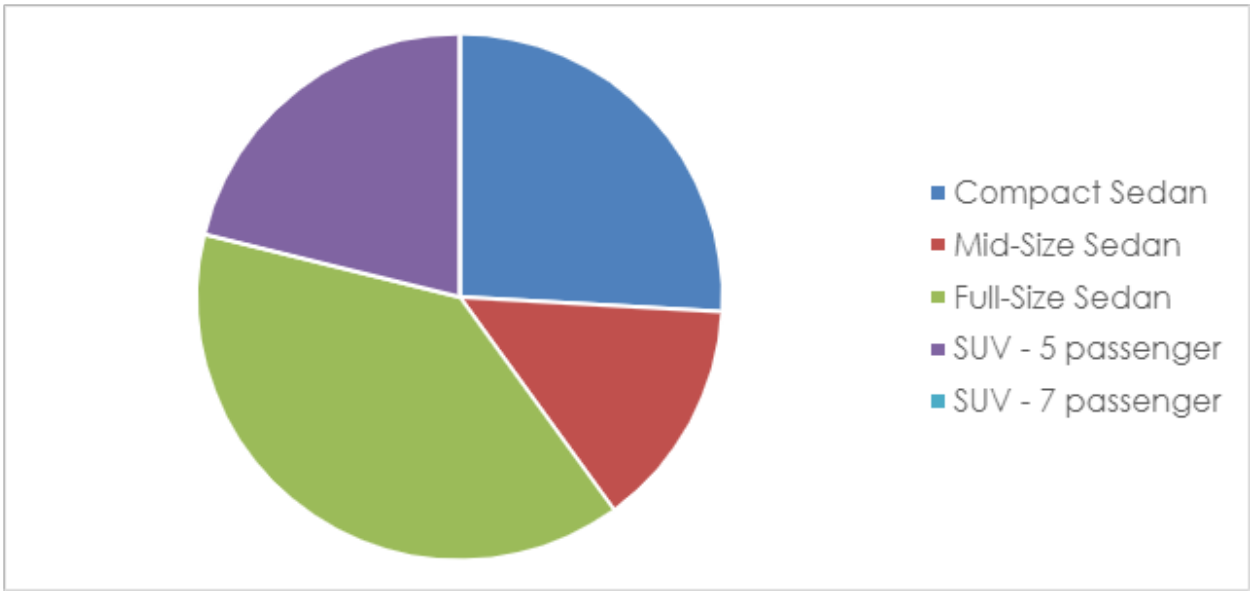
DSH-Metropolitan, located in an urban area, has approximately 160 acres and uses vehicles in a consistent manner as other locations. Currently, DSH-Metropolitan has 16 EV charging stations installed on campus. Future ZEV opportunities and existing infrastructure make DSH-Metropolitan a candidate to expand its EV charging infrastructure.

DSH-Napa has approximately 2,200 acres of wild land areas which staff are tasked with maintaining, patrolling, and providing emergency services for, along with 150 acres of improved areas, including Camp Coombs and the adjoining Skyline Park.

As mentioned above, some land is developed but most outlying areas are rugged and in a natural state, which require the availability of durable off-road vehicles.

DSH-Patton is in San Bernardino County. The hospital is positioned within 65 miles of DSH-Metropolitan and provides law enforcement and fire related services to local communities in the event of emergencies. DSH fleet assets are used a minimum of five workdays per week for short trips within the facility and do not accumulate the mileage requirements for the vehicle types utilized.

Graph 2.2: Composition of Light Duty Vehicle Fleet



In 2020, DSH consumed a total of 112,482 gallons of fuel compared to 116,913 gallons in 2018 resulting in a 3.8% decrease. These savings can be attributed to the addition of new fuel-efficient vehicle technologies and the increased availability of efficient green vehicles on state mandatory contracts. In Fiscal Year 2019-2020, DSH retained a total of ten traditional hybrids and thirteen battery electric vehicles (BEV) in its fleet inventory. DSH has four ZEVs in its approved 2020-2021 Fleet Acquisition Plan (FAP). Currently, DSH is working on adding six ZEVs to the Department's 2021-2022 FAP. Based on the CalEPA/DGS Climate Registry, from 2010-2020, DSH had a 16% decrease in total GHG emissions which reflects a reduction of 8,310 metric tons since 2010.

Medium and Heavy-Duty Fleet Vehicles

Each DSH facility uses both medium-duty and heavy-duty vehicles. DSH's statewide medium and heavy-duty fleet currently consists of pickup trucks, transit buses, ambulances, firetrucks, and a variety of equipment used by grounds and facility maintenance staff. Vehicles may encounter several surfaces on and off-site including black top, dirt roads, paved, and un-paved roadways.

Typical usages for DSH's medium and heavy-duty fleet assets include, but are not limited to, the following:

- Facility maintenance and operations
- Motor pool services
  - Food delivery
  - Laundry and patient property
  - Patient transportation to and from court and medical appointments
  - Staff transportation
  - Waste disposal
- Emergency services
  - Fire truck
  - Ambulance

Graph 2.3: Composition of Medium and Heavy-Duty Vehicle Fleet Subject to the ZEV First Purchasing Mandate

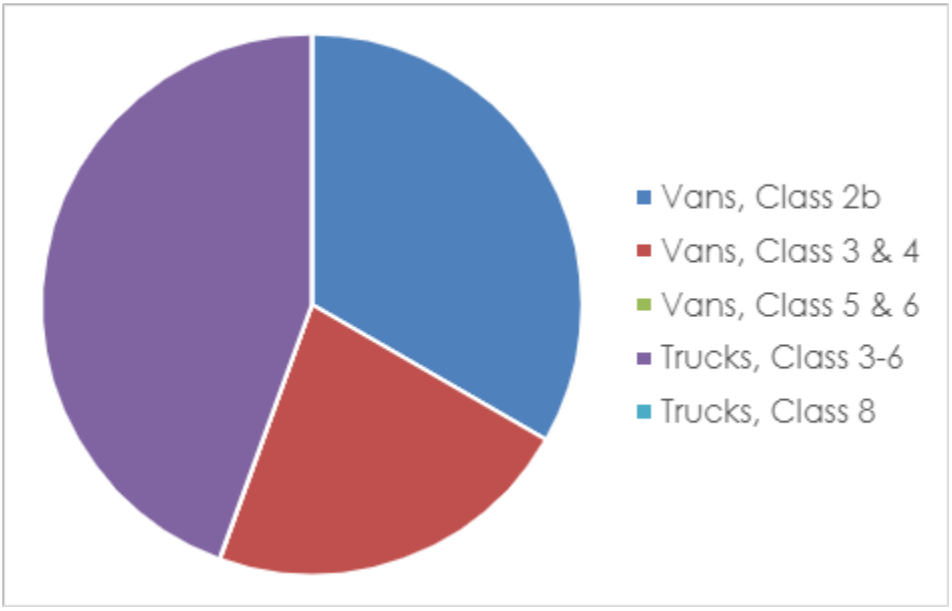


Table 2.1: Total Fuel Purchased in 2020

	Diesel	Gasoline	Renewable Diesel
Fuel Amount Gallons	50,738	148,004	9,222

Incorporating ZEVs into the State Fleet

Pursuant to the Governor's Executive Order (EO) B-16-12, state departments are required to increase the number of ZEV within their state fleet. As of January 1, 2020, Departments are required to purchase vehicles from authorized Original Equipment Manufacturers (OEMs) aligned with the California Air Resources Board (CARB).

With these requirements in place, DSH will continue to pursue the most effective ways to incorporate more medium to heavy duty ZEVs into the fleet.

Light-Duty ZEV Adoption

A widespread shift to ZEVs is essential for California to meet its Green House Gas (GHG) emission goals. State departments are now required to incorporate and prioritize a larger number of light-duty ZEVs in their vehicle fleets. Starting in FY 2017-18 the percentage of new light duty vehicles that must be ZEVs began increasing by 5% each year, reaching 25% in FY 2019-20 and 50% in FY 2024-25. ZEV vehicles are ideal for on-grounds usage and frequent idle run times, such as vehicles which provide patient and staff shuttle services.

Below is the summary that details the measures taken to date by DSH and future areas of improvement:

- DSH-Atascadero utilizes four-wheel drive (4WD) light-duty trucks for maintenance and repair of the buildings on the site's vast rural grounds
    - These vehicles rarely go off-grounds and DSH is evaluating whether a Battery Electric Vehicle (BEV) light-duty truck is available with suitable features and durability to replace traditional fossil-fuel powered trucks
- DSH-Coalinga has five Plug-In Electric Hybrids (PHEVs) for the motor pool used for mail, delivery, and transportation services, and one for use by the Office of Protective Services (OPS)

- Fleet fuel cell vehicles may also be used for transportation of employees to and from trainings, meetings, employee recruitment events, workshops, or other business-related travel
- DSH-Metropolitan utilizes seven ZEV's and seven PHEVs used primarily for administrative related trips such as trainings, employee hearings and offsite meetings
- DSH-Napa staff rely on two BEVs to provide pharmaceutical and physician support for all patient occupied facilities
- DSH-Napa plans to replace six existing vehicles each year with PHEVs over the next three consecutive fiscal years
- DSH-Patton utilizes its fleet similarly to DSH-Metropolitan, utilizing ZEVs for on-grounds transportation and patient/staff shuttle services between its two separate secured treatment areas

ZEVs are currently available on statewide commodity contracts in the sub-compact, compact, mid-size sedan, and mini-van vehicle classes.

The expanded range of ZEV vehicles available by state contract, ease of access to charging infrastructures, and reduced maintenance costs compared to vehicles using fossil-fuels, will continue to increase DSH's investments in eco-friendly green vehicles. There are currently 44 vehicles in DSH's fleet that are eligible for replacement in vehicle classes for which ZEVs are available on state contract. In addition, DSH is required to purchase a total of 20 ZEVs by 2025 to be compliant with Governor's Executive Order (EO) B-16-12.

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

	Sedans	Minivans	Pickups	SUVs, 5 passengers	SUVs, 7 passengers	Total
Number of vehicles eligible for replacement	19	7	19	1	0	46

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: Light Duty ZEV Additions to the Department Fleet

Types of Vehicles	21/22	22/23	23/24	24/25	25/26
Battery Electric Vehicle	4	1	0	2	1
Plug-in Hybrid Vehicle	0	4	1	1	4
Fuel Cell Vehicle	0	0	0	0	0
% of total purchases	**5%**	**TBD**	**TBD**	**TBD**	**TBD**
Required ZEV percentage	**35%**	**40%**	**45%**	**50%**	**TBD**
Total number of ZEVs in Fleet	**25**	**TBD**	**TBD**	**TBD**	**TBD**

Medium- Heavy-Duty ZEV Adoption

Pursuant to State Administrative Manual Section 4121.9, state agencies are required to prioritize purchasing of ZEV's in designated medium- and heavy-duty vehicle categories where programmatically feasible. Medium- and heavy-duty vehicles range from class 2b passenger vans, class 3 & 4 cargo vans, class 5 & 6 cargo step vans, class 3-6 trucks, class 4 utility trucks, class 6 box trucks, class 9 refuse trucks and class 8 tractor trailers.

Daily operations for medium- and heavy-duty vehicles range from:

- Emergency Response Vehicles: Ambulances and fire trucks provide emergency services at hospital facilities and surrounding areas in accordance with mutual aid agreements
- Facility Operations: Food delivery, laundry, mail, and patient property
- Patient Transportation: Transportation of patients by CDCR or OPS to local jails, medical, legal, and court-ordered appointments
- Plant Operations: Mobile services to provide air conditioning, plumbing, electrical repairs, construction, landscape, and facilities maintenance in staff- and patient-occupied areas

Challenges with use of medium and heavy-duty ZEV's include:

- Range limitations: Drivers must calculate how far the medium- and heavy-duty ZEVs are able to take them on a single round-trip
- Inability to install necessary EV charging infrastructure: Installation of EV charging infrastructure at the domicile site is not feasible and/or there is no publicly available infrastructure in the area that could be accessed to support the vehicles

Table 2.4: Medium Duty/Heavy Duty 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	6	4	0	8	0	18

Table 2.5: ZEV Additions to the Department Fleet

Type of Vehicle	21/22	22/23	23/24	24/25	25/26
Battery Electric Vehicle	8	10	10	10	10
Plug-in Hybrid Vehicle	0	0	0	0	0
Fuel Cell Vehicle	0	0	0	0	0
% of total purchases	**10%**	**TBD**	**TBD**	**TBD**	**TBD**
Total number of ZEVs in Fleet	**29**	**TBD**	**TBD**	**TBD**	**TBD**

ZEV Take-home Vehicles

Currently DSH has not issued home storage permits for ZEV vehicles. The only vehicles DSH has approved for vehicle home storage permit certification are gas vehicles that have special performance requirements necessary for the protection of public safety and welfare that are exempted from these mandates (Executive Order B-16-12 ZERO EMISSION PURCHASING MANDATE – 4121).

Telematics Plan

Telematics is a method for monitoring vehicle use. Using Global Positioning Systems (GPS) and on-board diagnostics, telematics provides valuable information that often results in fuel savings, opportunities for future ZEV adoption, 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 rule requiring 50% of ZEVs purchased to be BEVs is not in place for fleets making use of telematics for all ZEVs.

DSH has been actively reviewing new technology and planning for the implementation of telematics devices throughout all DSH fleet assets. DSH worked with RMJ Technologies to purchase telematics devices that were successfully installed at all five DSH hospitals.

The telematics devices connect directly to the current fuel management systems and systematically interface vehicle usage and fuel consumption data. Fuel Master software has been purchased and is currently being implemented at each hospital. At this time, telematics will not be used to enforce ZEV charging requirements.

Public Safety Exemption

DSH Office of Protective Services (OPS) law enforcement pursuit-rated vehicles are exempt from EO B-16-12 goals pursuant to:

- 165 California Vehicle Code section:
  - All DSH peace officers are appointed pursuant to Chapter 4.5, section 830 PC et. al. Specifically, 830.3(v)PC and 830.38 PC
- 21055 California Vehicle Code:
  - Driven in response to emergency calls
  - Pursuit of suspected/actual law violators
  - Provides fire suppression and medical aid (fire services)
  - All vehicles are equipped with solid, forward facing red lights and sirens
- SAM Management Memo 16-07 – Zero-Emission Vehicle Purchasing and Electric Vehicle Service Equipment Infrastructure Requirements:
  - DSH law enforcement qualifies as an exempt state law enforcement agency per Policy Overview, Item #5, Special Performance Requirements, as per SAM section 4121.4

DSH OPS law enforcement operations have the following types of public safety vehicles:

- Patient Transportation Vehicles (long range - 50+ mile round trips)
- OPS marked patrol vehicles
- Fire Engines
- Fire Chief vehicles (emergency response equipped)
- Detective vehicles
- Canine Transport vehicles
- Ambulances

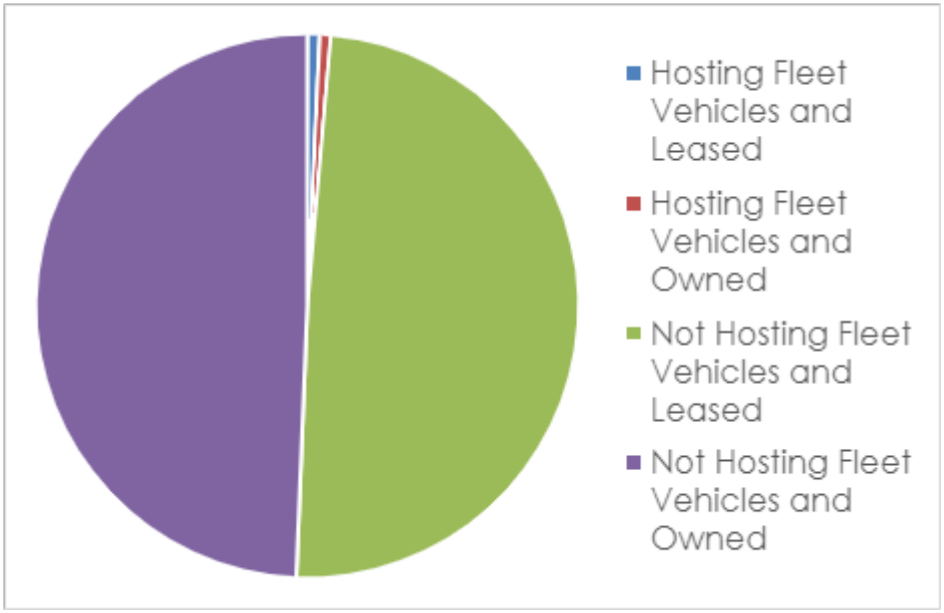
Department of State Hospitals Parking Facilities

DSH owns and operates all the parking surface lots at DSH facilities as parking is primarily designated for staff use. Some parking spaces are dual-use and, depending on the location, are available for use by staff and/or fleet vehicles. Each location has a limited number of designated parking spaces for use by visitors.

DSH does not offer public/host parking as all DSH facilities are closed campus and require full-time, on-site escorts. DSH does not differentiate between leased and owned parking spaces, as parking is limited.

Parking lots throughout DSH facilities are scarce and do not currently meet capacity needs nor support the logistical layouts of services performed across the facilities. DSH is in the process of developing an IMP which will provide an analysis of existing conditions for utilities, roads, and buildings. The IMP will evaluate options to increase the capacity of existing parking facilities.

Graph 2.4: Parking Facilities



Given the nature of the department's fleet operations, it was determined that L1 chargers should make up approximately 0.02% of chargers in employee parking areas and 1.1% of chargers in fleet parking areas, with the remainder being L2. DGS recommends *at least* 25% of chargers for employees be L2 and that 75% of fleet chargers be L2.

Based on estimates of future ZEV fleet purchases, and a count of visitor and workplace parking spaces, it has been determined that DSH will need approximately 341 chargers 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 2.6: High Priority EVSE Projects

Facility Name	Total Parking Spaces	Existing L1 Charging Ports (2020)	Existing L2 Charging Ports (2020)	Existing L3 Charging Ports (2020)	Total Charging Ports (2020)	EV Charging Ports Needed by 2025
DSH-Atascadero	1169	1	2	0	3	58
DSH-Coalinga	1598	0	2	0	2	80
DSH-Metropolitan	1773	0	18	0	18	86
DHS-Napa	1093	0	7	0	7	55
DSH-Patton	1294	0	3	0	3	62
Total	**6927**	**1**	**32**	**0**	**33**	**341**

Outside Funding Sources for EV Infrastructure

Various programs are available to DSH, including but not limited to:

- DGS Office of Sustainability Transportation Unit general fund funding for state facilities

Various utility make-ready and charger incentive programs

Hydrogen Fueling Infrastructure

Currently, DSH has no plans to install hydrogen fueling infrastructure at its facilities. However, DSH is working closely with the Department of Finance (DOF) to ensure fueling and electrical infrastructure is built into the scope of future facilities projects, accounting for growth and compliance with future demand. Discussions with the California Department of Transportation (CalTrans) regarding shared infrastructure for hydrogen fueling will continue to be evaluated.

In addition, a hydrogen fueling station is available less than five miles from DSH-Coalinga. This has enabled this location to purchase fuel cell vehicles to meet ZEV goals.

Comprehensive Facility Site and Infrastructure Assessments

Site assessments are performed to establish the cost and feasibility of installing needed EV infrastructure. The table below lists the facilities that have been evaluated with Site Assessments.

Table 2.7: Results of Site Assessments

Facility Name	L1 Chargers with Current Electrical System	L2 Chargers with Current Electrical System	Total cost for Project using Current Electrical System	L1 Chargers with Electrical System Upgrades	L2 Chargers with Electrical System Upgrades
DSH-Atascadero	1	2	0	N/A	32
DSH-Coalinga	0	2	0	N/A	36
DSH-Metropolitan	0	18	0	N/A	59
DHS-Napa	0	7	0	N/A	48
Total	**1**	**32**	**0**	**N/A**	**175**

EVSE Construction Plan

As described previously, DSH will continue to work with DGS and DOF on all future projects to incorporate implementation of Electric Vehicle Supply Equipment (EVSE) standards and other infrastructure needs which will assist DSH in meeting future goals.

DSH will also continue to work with DGS Office of Sustainability Transportation Unit on turnkey EV charging projects at the facilities included in Table 2.6

- DSH-Atascadero currently has one Level 1 and two Level 2 chargers and anticipates adding 42 more
- DSH-Coalinga currently has two Level 2 chargers and anticipates adding 36 more
- DSH-Metropolitan currently has 18 Level 2 chargers and anticipates adding 63 more

- DSH-Napa currently has 7 Level 2 chargers and anticipates adding 50 more
- DSH-Patton currently has 3 Level 2 chargers and anticipates adding 65 more

DSH will continue to evaluate its existing parking lots, recommending installation of electric vehicle charging infrastructure where most cost-effective and appropriate. DSH anticipates installing 341 EV charging ports at the hospitals utilizing grant funding administered by DGS and within estimated construction timelines.

EVSE Operation

DSH plans to evaluate current DGS EVSE guidelines and policies to implement for departmental use. DSH Plant Operations and Hospital Administrators will work closely together with DSH Fleet and Asset Management Section (FAMS) to draft an enterprise-wide policy applicable to all DSH locations. Further, EVSE reporting requirements and data collection efforts will be established and implemented according to DSH fleet management policies and directives.

DSH EV chargers are used by state fleet and state employees' vehicles. EV chargers are purchased and installed by the hospitals as well as the DGS Office of Sustainability Transportation Unit. Although maintenance is limited on these charging units, DSH staff are responsible for the upkeep and repair of the equipment after the equipment warranty expires

CHAPTER 3 - ENERGY

Department Mission and Built Infrastructure

DSH's five facilities encompass nearly 6.2 million gross square feet of space in 832 buildings and roughly 2,600 acres of land. DSH continuously works to optimize and minimize energy use by improving the efficiency of mechanical equipment, facilities, and operations. DSH has been working with DGS and contracted ESCOs to conduct comprehensive energy audits at DSH facilities that will result in documented solutions for achieving energy cost reductions. ESCOs offer turn-key services for all phases of energy efficiency retrofit projects through a single contract and assume performance risks for installed measures.

Energy is supplied to most of the DSH facilities through the purchase of power from local electric companies. DSH-Napa is the exception, generating 90% of its electric power from its on-site cogeneration plant. Natural gas for the cogeneration plant is procured from either the DGS Natural Gas Services Program or a local gas company.

Table 3.1: Total Purchased Energy 2020

Purchased Energy	2003 Baseline Quantity		2020 Quantity		% Qty. Change
Electricity	179,856,224	kWh	64,240,514	kWh	-64%
Less EV Chging	-	kWh	-	kWh	-
Natural G	5,877,559	therms	5,615,086	therms	-4%

Table 3.2: Properties with Largest Energy Consumption

Building Name	Floor Area (ft2)	Site Energy (kBTU)	Source Energy (kBTU)	Source EUI (kBTU/ft2-yr)
ATASCADERO STATE HOSPITAL	903,748	129,546,740	234,435,250	334
COALINGA STATE HOSPITAL	1,190,689	131,048,026	299,606,215	338
METROPOLITAN STATE HOSPITAL	1,233,932	49,541,318	153,934,185	183
NAPA STATE HOSPITAL	1,565,915	366,273,883	420,210,493	264
PATTON STATE HOSPITAL	1,307,200	129,611,299	274,570,998	214
Total for Buildings in this Table	**6,201,484**	**806,021,266**	**1,382,757,141**	**---**
Total for all Department Buildings	**6,201,484**	**806,021,266**	**1,382,757,141**	**---**
% of Totals	**100%**	**100%**	**100%**	**---**

Beginning in 2020, and in response to the COVID-19 pandemic, DSH collaborated with engineering firms to evaluate HVAC systems statewide and provide corrective recommendations to improve air filtration and air ducting performance. Plant operations staff and the engineering firm completed various corrections to both facilitate the Testing, Adjusting, and Balancing (TAB) to address opportunities for improving system operations.

Below is a summarized list of specific energy conservation measures installed to date at each of DSH's facilities:

DSH - Atascadero:

- Upgrades to LED lighting
- Replacement of existing cooling towers (CT) with new water efficient CTs
- New Siemen's "Apogee" Building Automation System (BAS)
- Boiler controls and burner upgrades

DSH-Coalinga

- Upgrades to LED lighting
- New lighting control panels with timers that schedule on/off times in public areas and in-patient dorm rooms

DSH-Metropolitan:

- New high-efficiency Variable Frequency Drives (VFDs) for cooling tower fans
- Lighting retrofits (interior and exterior upgrades)
- High efficiency motors for Air Handling Units (AHU)
- Installation of new cool roofs on several buildings
- Boiler feed water pump VFDs
- Static pressure sensor controlling AHU VFDs
- Chiller with heat reclaim capabilities
- Boiler economizer
- Free cooling based on enthalpy, dry temperature and AHU reset temperature set point
- Rebuild or replace steam traps

DSH-Napa:

- Lighting retrofits (interior and exterior upgrades)
- Replacement of supply exhaust fan motors with energy efficient motors
- Installation of a new, more efficient liquid oxygen system
- Purchase of two new properly sized (20 horsepower) compressors for the turbines
- Turbine retrofits and upgrade to Turbotronics is underway

DSH-Patton:

- High efficiency motors for AHUs
- New high-efficiency VFDs for cooling tower fans
- Installation of high efficiency Air Conditioner (AC) compressors (TurboCore)
- Lighting retrofits (interior and exterior upgrades)
- Boiler retrofits
- Expanded Business Management System (BMS)
- Connection to city water - discontinued use of energy inefficient well pumps

DSH continues to monitor and actively track the effectiveness of its energy retrofit projects and the reduction of grid-based energy purchases for DSH buildings by utilizing the statewide data entries submitted to the Energy Star Portfolio Manager (ESPM) and in compliance with the following green policies:

- California Department of Technology's Policy 4819.31 related to power management practices
- Management Memo 14-07 - Standard Operating Efficiency Procedures
- Management Memo 14-09 - Energy Efficiency in Data Centers and Server Rooms
- Management Memo 15-04 - Energy Use Reduction and Reporting for New, Existing, and Leased Buildings

Future site upgrades are proposed annually in DSH's Five-Year Infrastructure Plan, which is a short- and long-range plan that identifies Capital Outlay and Deferred Maintenance/Special Repair project needs, as well as a planning schedule with funding requirements. Funding for projects is formally requested each year through the legislative budget process along with a list of prioritized projects, cost estimates, and justifications. Plant Operations, management, and hospital staff, along with Executive participation, submit the prioritized list of special repair and renovation needs to DSH headquarters for consideration. ESCO projects are also ongoing at each of the five hospitals, including identifying additional energy efficiency measures during the preliminary assessment.

Due to the size, cost, and complexity of most major renovation and construction projects, DGS is typically hired to manage the work efforts. Conversely, minor special repair and improvement projects will be retained by DSH under the purview of on-site facilities management and maintenance staff.

Zero Net Energy (ZNE)

State policies set forth the following milestones for state Zero Net Energy (ZNE) buildings:

- 2017 – 100% of new construction, major renovations, and build-to-suit leases beginning design after 10/23/2017 to be ZNE
- 2025 – 50% of total existing building area will be ZNE

Table 3.3 Zero Net Energy Buildings

Status of ZNE Facilities	Number of Facilities	Floor Area (ft^2)	% of Facilities Area
Facilities completed and verified	0	0	0%
Facilities in design or under construction	0	0	0%
Facilities proposed for before 2025 (but not yet in design)	0	0	0%
Additional existing facilities area within 15% of ZNE target EUI and have EE projects planned	0	0	0%
Totals for ZNE facilities by 2025	**0**	**0**	**0%**
Totals for all department facilities by 2025	**0**	**6,201,484**	
% ZNE by 2025	**0%**	**0%**	

DSH's ZNE goals are challenged due to the need for DSH facilities to operate 24 hours per day, 365 days per year and are dependent upon utility grids for power supplies.

Two facilities, DSH-Coalinga and DSH-Patton use utility grids coupled with renewable energy for their daily operations. While ZNE will not work with the existing patient buildings, DSH will attempt to implement ZNE solutions in other non-patient occupied buildings.

New Construction Exceeds Title 24 by 15%

All new state buildings and major renovations beginning design after July 1, 2012, must exceed the current California Code of Regulations (CCR) Title 24, energy requirements by 15% or more.

The California Energy Code is part 6 of the California Building Standards Code, which is Title 24 of the CCR. The goal of Title 24 is to ensure that building construction, system design, and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. These standards establish a minimum level of building energy efficiency for both residential and nonresidential buildings. A building can be designed to a higher efficiency level, resulting in additional energy savings. The following new buildings demonstrate DSH's progress in meeting the emergency requirements.

DSH-Napa - New Main Kitchen

Completed November 2017

Figure 5 - New Main Kitchen - Napa

The DSH-Napa New Main Kitchen project consisted of a new single-story 29,000 gross square foot central kitchen facility. The project scope included abatement and demolition of existing structures, site clearing and grubbing, earthwork, excavation, and underground utilities. Site improvements included landscape, irrigation, walks, curbs, gutters, and parking. The building is a concrete slab on a grade, steel structure, with plaster exterior and single ply roof with skylights. Special features include new kitchen equipment, high-capacity food storage racks, a large refrigerator, freezer walk-ins, and loading docks with overhead coiling doors. Finishes include epoxy flooring, ceramic tile, carpet tile, gypsum board, and acoustical ceilings. Additional features include a card key access system, Closed Circuit Television (CCTV), and a diesel power engine generator.

According to the code analysis in the construction documents, building design exceeded Title 24 by 10% and is rated "Silver" in Leadership in Energy and Environment Design (LEED).

DSH-Metropolitan - New Visitor Building

Completed August 2019

Figure 6 - New Visitor Building - Metropolitan

The DSH-Metropolitan New Visitor Building project consisted of a single-story, 3,904 gross square foot Visitor's Center building, over 4,500 linear feet of security fencing complete with lighting and camera systems, vehicular sally ports, an

enclosed recreational park area with restroom facilities, a parking lot for staff and visitors, as well as five new security posts along the improved perimeter fence. The Visitor's Center building contains two control rooms serving the sally ports, a large visiting room, several private visiting rooms, several restrooms for visitors and patients, as well as support spaces for equipment serving the Visitor's Center, and fence-line lighting and cameras.

The design was done with energy efficiency in mind. Wall insulations and windows meet energy code requirements for building envelopes while conforming to special security standards required for this site. The rooftop packaged air-conditioning unit specified exceeds the minimum required efficiency per Bureau of Energy Efficiency (BEE) section 110.2. Similarly, the lighting systems utilize the latest in LED technology, as well as sensors, dimmers, and timers to maximize energy savings. The installed indoor lighting system wattage exceeds the applicable Title 24 energy requirements by over 30%. The building is also equipped with solar tubes which direct sunlight into the rooms during daytime and reduce the need for lighting.

The outdoor fence security lighting utilizes efficient LED fixtures that exceed the efficiency of similar security lighting installations. The outdoor fixtures are equipped with photocells to ensure energy savings during daylight.

DSH-Patton - New Main Kitchen

Completed Sept. 2019

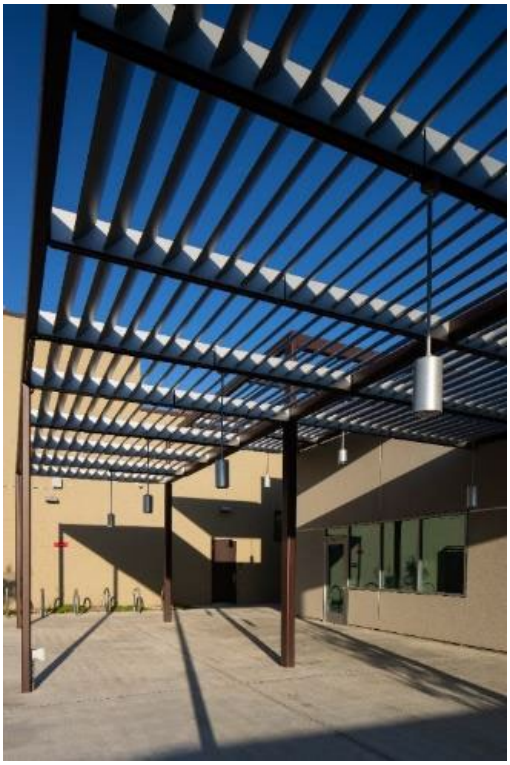


Figure 7- Patton Kitchen Shade Structure

The DSH-Patton New Main Kitchen project consisted of a new single-story 36,500 gross square foot Central Kitchen facility. With similar site improvements and amenities as the DSH-Napa New Main Kitchen, its design has exceeded Title 24 by 10% and has also achieved LEED Silver rating.

DSH-Metropolitan -Consolidation of Police Services

Figure 8 – Consolidation of Police Services - Metropolitan

The DSH-Metropolitan Consolidation of Police Services project consists of a new single-story 20,700 gross square foot Police Operations building. Site improvements consist of grading, paving for roads and parking, retaining walls, water distribution system, wastewater collection and disposal systems, storm drainage systems, erosion control measures, and electrical and communications distribution systems. This project also includes the construction of a new signalized intersection.

Table 3.4: New Construction Exceeding Title 24 by 15%

Buildings Exceeding Title 24 by 15%	Number of Buildings	Floor Area (ft2)
Completed Since July 212	3	69,400 Napa Kitchen Patton Kitchen Metropolitan Visitor Building
Under Design or Construcion	1	20,700 Metropolitan Consolidation of Police Services
Proposed Before 2025	N/A	N/A

*Infrastructure Master Plan (IMP) results will provide additional options for ZNE

Reduce Grid-Based Energy Purchased by 20% by 2018

DSH facilities follow guidelines specified in DGS Management Memo 14-07 regarding efficient energy management in state buildings during normal operations. DSH has implemented several energy-efficient projects to reduce plug load and consumption. Grid-based energy purchasing reduction has also

been achieved through the installation of LEDs, photovoltaic solar panels, and modernized HVACs in various buildings at its five hospitals. To further reduce DSH's dependency on grid-based energy, the following energy conservation measures have been incorporated into DSH's day to day operations:

- Designated Energy Coordinators for each facility are responsible for ensuring that DGS' standard operating efficiency procedures are communicated and carried out
- Facilities maintenance personnel shall install occupancy sensors appropriate to the room geometry and usage patterns of the space, wherever practical
- DSH strives to purchase the most energy-efficient ENERGY STAR rated equipment, considering Environmentally Preferable Purchasing (EPP) principles
    - DSH relies on Leveraged Procurement Agreement (LPA) contracts, pre-negotiated by the California Department of Technology (CDT)and DGS, that contain language regarding Energy Star or Electronic Product Environmental Application Tool (EPEAT) requirements
    - Energy Star and EPEAT certified products allow for easy selection of high-performance electronics that support DSH's Information Technology (IT) and sustainability goals, while meeting EPP and/or State Agency Buy Recycled Campaign (SABRC) requirements
- DSH's temperature set point for building heating and cooling systems are no higher than 68°F in winter and no lower than 78°F in summer.
- DSH maintenance personnel shall inspect and maintain ducts, air filters, and related hardware to maximize effectiveness of building systems at the lowest acceptable power use

Building Systems:

DSH facilities, except for DSH-Napa, utilize an Energy Management System (EMS) from Siemens software "Apogee", which integrates multiple building systems for ease of operations and monitoring (DSH-Napa has only one building [#99] with EMS).

Energy conservation measures offered with EMS include:

- All hospitals have Economizers which are controlled by the EMS system. The Economizers are installed on the AHUs which provide free cooling during low temperatures and regulate zones by sensing outdoor temperatures
- Most of the hospitals' HVAC systems are constant volume and very few places have Variable Air Volume (VAV) based systems
- Night flushing keeps windows and other passive ventilation openings closed during the day but open at night to flush warm air out of the building and cool thermal mass for the next day
    - Patient buildings are secured areas requiring all windows to remain closed during the night and cannot use night flush cycles
    - Because patient buildings are secured areas, HVAC systems in all buildings are designed to operate on a 24 hours per day, 7 days a week basis, 365 days per year and can use only economizers for free cooling

Other energy efficiency practices:

- DSH information technology data centers currently meet the guidelines listed in DGS Management Memo 14-09
- All DSH facilities must ensure the domestic, tempered hot water system is set between 105˚F and 120˚F due to licensing standards
    - Water temperatures are checked monthly by plumbing staff to ensure temperatures are being efficiently maintained within licensing requirements
    - These results are sent to DSH Health and Safety Officers for review and tracking
- All DSH facilities follow strict preventative maintenance programs when scheduling periodic equipment maintenance
    - For example, HVAC ducts, filters, and equipment are inspected and maintained on a regular basis, based on manufacturer recommendations, to maintain maximum effectiveness
- HVAC filters are replaced with Minimum Efficiency Reporting Value (MERV) 8 or better poly pads every six months
- Air Quality Management Districts (AQMD) requires that boilers are tested and calibrated for emission every three months and source tested every three years
- Boilers are inspected annually by the Department of Industrial Relations (DIR) Department of Occupational Health and Safety (Cal-OSHA) to ensure tubes and refractory components are in satisfactory condition
- Repairs are made as soon as possible to address any reported deficiencies

Information Technology

Compliance with the Governor's sustainability goals requires energy saving features on computers, copiers, and printers. Most computers' power management on DSH campuses are controlled using "Active Directory" group policies deployed to optimize power management settings.

- Approximately 95% of DSH's desktop computers have group policies in place that place the computer in a power saving mode (sleep) after a set amount of inactivity
- The remaining PCs are specifically set to not to power saving mode when inactive because they are running specific software related to safety and security or are monitoring vital information (i.e., terminals in sally ports for alarm systems)
    - All monitors and printers on location are set to auto-sleep when no signal is detected from the source
    - Energy efficiency strategies in DSH server rooms are comprised of sustained vendor-set temperatures on dedicated cooling systems which range between 73 degrees Fahrenheit to 81 degrees Fahrenheit
    - All new IT infrastructure must comply with Energy Efficient Ethernet (EEE) standards
    - 99% of DSH servers are virtual machines with new equipment going into the cloud or virtualized on an existing host server to maximize usage of machines processing power

Energy Use Intensity (EUI) expresses a building's energy use as a function of its size or other determined characteristics. According to research, the typical EUI value for hospitals varies from 65 to 256 kBtu/ft^2.

Table 3.3: Department-Wide Energy Trends

Year	Floor Area (ft2)	Total Source kBTU Consumption	Department Ave. Source EUI
Baseline Year 2003	6,195,651	1,534,516,398	234
2017	6,201,484	1,195,523,486	193
2018	6,201,484	1,568,160,775	253
2019	6,201,484	1,307,736,924	211
2020	6,201,484	1,328,317,874	214
% Change 2003-2020		**-13%**	**-8%**

All energy values reflected in Table 3.5 are grouped into a combined figure as each campus has one meter for the entire facility. Further, Table 3.5 shows DSH consumed 1,328,317,874 kBtu of electricity in 2020, compared to 1,534,516,398 kBtu in base year 2003, equating to a 13% electricity reduction.

Table 3.6: Summary of Energy Projects Completed or In Progress

Year Funded	Energy Saved (kBtu/year)	Floor Area Retrofit (ft2)	% of Department Floor Area
2018	Unknown	2,605,759	40%
2020	115,030,424	1,289,948	52%
2021	10,597,301	Unknown	65%
Total	**125,627,725**	**3,895,707**	**157%**

Future Energy Projects

A solar power plant is a utility-scale facility that converts sunlight into electricity, utilizing photovoltaics (PV) solar panels to absorb and convert sunlight into electricity. The primary purpose of a solar power plant is the wholesale or retail sales of generated electricity.

Solar PV Plants: Currently solar PV projects underway at four hospitals which will reduce grid load dependency:

DSH Atascadero: a 9-acre 1.4 MW ground mount system is in place. No future solar projects are planned for this facility.

DSH Coalinga: a 20-acre 2 MW canopy system is in the planning stage.

DSH Napa: a 9.4-acre 1 MW system is in place. No future solar projects are planned for this facility.

DSH Metropolitan: A 1.5 MW canopy system is currently in the feasibility phase and is planned to be installed in 2023.

ESCO Projects

DSH has the following energy conservation efforts in progress at each location:

DSH-Metro: The Investment Grade Audit is 90% complete. The comprehensive project includes lighting and lighting controls retrofit, HVAC retrofits, Kitchen equipment retrofits, BAS and Demand Management upgrades.

DSH-Atascadero: Johnson Controls completed a campus-wide audit to identify potential energy saving measures and completed the Investment Grade Audit. The Interior, exterior, and street lighting fixture upgrades to LED are currently in progress. Additional upgrades are as follows:

- Heat reclaim for 100% outside air to return to system for reuse
- Replace Constant Air Volume (CAV) controls with new Direct Digital VAV controls
- BAS controls
- Transformer replacement with more efficient units
- Replace AHUs currently using old refrigerant

DSH-Coalinga: PG&E completed a campus-wide Investment Grade Audit to further develop energy saving measures identified in the Preliminary Assessment phase. The interior, exterior, and street lighting fixture upgrades to LED are currently in progress. Additional upgrades are as follows:

- Retro-commissioning (RCx) of Central Plant and HVAC
- BAS controls expansion
- Sub-metering at building level (water and electricity)
- Refrigeration retrofits
- Boiler burner replacement/Pony Boiler addition
- Water side economizer
- AHUs –VFD and high efficiency filtration system
- Replace evaporative cooler with Direct Expansion (DX) AHU

DSH-Napa: Clark Energy Group (CEG) completed a campus-wide Investment Grade Audit to identify potential energy saving measures. The interior, exterior, and street lighting fixture upgrades to LED are currently in progress. Additional upgrades are as follows:

- Boiler upgrades
- Central Plant steam pressure reduction
- Steam trap & valve repair
- Steam system insulation
- CAV to VAV conversion

- Building controls strategies
- Domestic water fixture replacement

DSH-Patton: Enovity competed a campus-wide Investment Grade Audit to further develop energy saving measures identified in the Preliminary Assessment Phase. The interior, exterior, and street lighting fixture upgrades to LED are currently in progress. Additional upgrades are as follows:

- New chiller plant
- Multizone to VAV retrofit
- Cooling tower VFDs

Table 3.7: Energy Surveys

Year	Total Department Floor Area (ft2)	Energy Surveys Under Way (ft2)		% of Department Floor Area (ft2)	
		Level 1	Level 2	Level 1	Level 2
2014	6,566,291	0	292,148	0%	4%
2015	6,567,151	0	2,533,761	0%	38%
2016	6,163,303	0	611,157	0%	10%
2017	6,161,303	0	2,702,040	0%	43%
2018	**6,181,135**	**0**	**2,605,759**	**0%**	**42%**
2019	**6,181,135**	**0**	**450,000**	**0%**	**7%**
2020	**6,181,135**	**0**	**1,298,315**	**0%**	**21%**

Demand Response

To implement any Demand Response (DR) program, a thorough audit of the facilities infrastructure needs to be completed. These audits typically include investigations into electrical load capacity versus demand, HVAC systems and controls, plant operations, and other infrastructure components. Also taken into consideration are staff occupancy, patient care needs, and the governing policies and procedures that have an impact on the consumption of electricity.

DSH's five facilities have not had formal energy audits in the last five years and therefore do not currently participate in any DR programs. However, energy audits at all five hospitals are continuing as part of the ESCO projects ensuring future DR programs are addressed through the DSH Sustainability Workgroup discussions. The 24 hours per day, seven days per week, 365 days per year operational nature of the hospitals, combined with the many regulatory requirements and constraints, makes load-shedding difficult to implement without professional engineering and electrical system control upgrades. Additionally, the

age of most of the hospitals' current infrastructure and lack of ability to isolate non-clinical buildings and areas, are some are significant barriers to DSH participating in DR programs.

Figure 9 - Typical Sun Tracking Photovoltaic Array at DSH-Napa

Renewable Energy

DSH is progressing toward the Governor's sustainability goals with its two large solar PV plants at DSH-Coalinga and DSH-Patton. Below is a chart showing existing and future solar photovoltaic (PV) plants being planned at DSH facilities:

Table 3.9: On-Site Renewable Energy

Status	Number of Sites	Capacity (kW)	Estimated Annual Power Generation (kWh)	% of Total Annual DGS Power Use
On-Site Renewables in Operation or Construction	5	6,600	10,408,200	0
On-Site Renewables Proposed	5	9,000	14,193,000	0
On-Site Renewables Totals	10	15,600	24,601,200	0
Department-Wide ZNE-Targeted Facility & Energy Current & Proposed On-Site Totals	17		0	
Off-Site Renewable Totals	2	39,000	0	0

Off-Site Renewables Planned	0	0	0	0
Off-Site Renewables Combined Current & Planned	0	39,000	0	0
Current Combined On-Site and Off-Site Renewable Energy	**7**	**45,600**	**10,408,200**	**0**
Additional Planned On-Site and Off-Site Renewable	5	9,000	14,193,000	0

Table 3.9b: Renewable Energy (Solar PV Plants) Chart for DSH Facilities

DSH Facility	MW	kWh generated/year	Area (acres)	Existing or Future
DSH-Atascadero	1.4	2,273,278	9	Existing
DSH-Coalinga	2	5,148,774	14	Existing
DSH-Coalinga	3.15	9,585,342	20	Future (2023)
DSH-Metropolitan	TBD	N/A	9	Future (2023)
DSH-Napa	1	2,273,278	9.4	Existing
DSH-Patton	N/A	Non-operational	9.2	Existing
DSH-Patton	TBD	N/A	14	Future (2023)
Total	**7.55**	**26,702,724**	**84.6**	

Monitoring Based Commissioning (MBCx)

DSH has installed BMS systems in most of its facilities in buildings over 5,000 square feet. The facilities, in general, are proficient in the use of their BMS systems, except for the occasional issue of a sensor failure or controllers/detector not performing well. DSH-Napa will have some components of its Energy Management System (EMS) upgraded as a part of the DGS ESCO project.

Table 3.10: Planned MBCx Projects

Location	Floor Area (ft2)	EMCS Exists? (MBCx Capable, MBCx Difficult, No EMCS)	MBCx Projected Start	Projected Cost ($)
DSH-Atascadero	903,748	MBCx Capable	N/A	$0
DSH-Coalinga	1,185,312	No EMCS	N/A	$0

DSH-Napa	1,565,915	MBCx Capable	N/A	$0
DSH-Metropolitan	1,218,276	MBCx Difficult	N/A	$0
DSH-Patton	1,307,884	No EMCS	N/A	$0
Totals	**6,181,135**			**$0**

Financing

Various financing programs are available to DSH, including but not limited to:

- Capital Outlay and Control Section 6.10 Funds
- Agency Funded
- Power Purchase Agreement (PPA) for renewable energy projects
- Utility Provider On-Bill Financing
- Energy Services Company (ESCO) Performance Contracts
- GS $Mart Loans

Chapter 4-WATER EFFICIENCY AND CONSERVATION

This water efficiency and conservation report highlights the progress the Department has made toward meeting the Governor's goals. This report identifies successful accomplishments, ongoing efforts, and outstanding challenges.

California experiences the most extreme variability in yearly precipitation in the nation. In 2015, California had record low statewide mountain snowpack of only 5% of average and 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 close to becoming the wettest year in the Tulare Basin (set in 1968-69). 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.

Using water wisely is critical. The EOs and SAM sections listed previously demonstrate the connection between water and energy use, (the water-energy nexus), water and climate change, and water and landscaping. The impact of water uses by state agencies is not within the scope outlined in EOs, SAM sections or DGS management memos. These policies and guidelines do not address issues such as water runoff from landscaping and various work processes, the potential for water pollution or the benefits of water infiltration, soil health and nutrient recycling. 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.

Best Management Practices

Developing Best Management Practices (BMPs) statewide are ongoing to establish and maintain building water use efficiency. Water management plans are in place or being finalized at all DSH facilities. These plans will ensure consistent water quality testing.

Department Mission and Built Infrastructure

The built infrastructure of the five hospital facilities encompasses roughly 2,856.3 acres of land and 6.1 million gross square feet of space in 832 buildings.

DSH Facility Square Footage (Total Areas)

Facility	Total Square Footage
DSH-Atascadero	903,748
DSH-Coalinga	1,185,312
DSH-Metropolitan	1,218,276
DSH-Napa	1,565,915
DSH-Patton	1,307,884

Sustainable water management practices strategically align with DSH's mission as fiscal and environmental stewardship goals drive internal water conservation priorities.

Continuous improvement of water efficiency programs including development of strategies to maximize use of surface run-off, collection of rainwater, and preservation of treated domestic water for critical campus uses is a continuous goal for DSH. In addition, DSH continues to improve water efficiency in existing buildings through maintenance and retrofits, and by providing education and awareness on the need and benefits of proactive water conservation.

Water main systems are designed to provide adequate flows for domestic, commercial, and fire protection uses. Departmental water conservation measures also consider the various sources of water supply systems at DSH's five facilities:

DSH Water Conservation Measures by Facility

Hospital	Source
DSH-Atascadero	Uses well water at campus, no recycled water available
DSH-Coalinga	Buys potable and irrigation water from City of Coalinga
DSH-Metropolitan	Buys potable water from City of Norwalk and recycled water from the local sanitation district
DSH-Napa	Buys potable and irrigation water from City of Napa, including limited quantity of recycled water from Napa Sanitation district
DSH-Patton	Buys potable and irrigation water from local municipality

Table 4.1: 2020 Total Purchased Water

Purchased Water	Quantity	Cost ($/year)
Potable	474,590,464	$2,881,230
Recycled Water (Metro & Napa Only)	45,409,036	$ 249,301
Total	**519,999,500**	**$3,130,531**

Table 4.2: Properties with Largest Potable Water Use Per Capita

Facility Name	Area (ft2)	# of Facility Occupants	Total 2020 gallons	Total 2020 Irrigation in gallons (if known)	Total Gallons Per Capita
DSH-Atascadero	903,748	2,922	89,906,100	Unknown	30,769
DSH-Coalinga	1,190,689	3,253	61,050,764	Unknown	18,768
DSH-Metropolitan	1,233,932	2,377	137,039,496	Unknown	57,652
DSH-Napa	1,565,915	3,370	117,489,240	Unknown	34,863
DSH-Patton	1,307,200	3,793	114,513,900	Unknown	30,191
Total for Buildings in This Table	**6,201,484**	**15,715**	**519,999,500**	**Unknown**	**172,243**
Total for All Department Buildings	**6,201,484**	**15,715**	**519,999,500**	**Unknown**	**33,089**
% of Totals	**100%**	**100%**	**100 %**	**Unknown**	**521%**

DSH has been diligent in its efforts to conserve water usage at its facilities by using low flow fixtures and appliances where possible, through continued installation of new plumbing technologies in all renovated and new construction projects, and through prompt repair of building leaks. Examples of water efficiency measures commenced by DSH facilities include installation and use of the following:

- High efficiency, low-flush urinals and toilets
- Efficient low-flow shower heads
- Proactive leak detection and repairs
- Drip irrigation with smart controllers
- Shut off timers

All showers are equipped with timers to help with water reduction, and shower heads include a flow restrictor installed by the manufacturer. Aerators are also in use to control the amount of water that flows through the tap without affecting the water pressure in staff areas. However, aerators cannot be installed in patient areas due to ligature risk to patients. Anti-ligature items are currently being installed in patient areas as following the guidelines and requirements from The Joint Commission.

Table 4.3: Properties with Largest Landscape Area

Facility Name	Estimated Landscape Area (ft^2)
DSH-Atascadero	290,180
DSH-Coalinga	100,000
DSH-Metropolitan	1,218,276
DSH-Napa	390,139
DSH-Patton	1,307,884
Total Landscaping area for Facilities in This Table	**3,306,479**
Total Landscaping for All Department Facilities	**3,306,479**

Recycled water is mostly used for non-potable purposes such as agriculture, landscape, and irrigation. Other non-potable applications include its use in cooling water for power plants, toilet flushing, dust control, construction activities, and water features. Recycled water costs about half as much as potable water and its use helps preserve potable supplies and local water tables.

DSH is taking steps to utilize recycled water for landscape and irrigation purposes wherever available:

- DSH-Metropolitan makes optimal use of recycled water for maintenance of its grounds by utilizing over 45 million gallons annually
- DSH-Napa is currently connected to one of the five available meters that provide approximately 4,000 gallons of recycled water annually and relies on this recycled water for outdoor purposes

DSH will evaluate options for the design, installation, and operation of on-site recycled water systems at its remaining facilities as recycled water is made available by local municipalities and plumbed directly to DSH's facilities.

DSH's commitment to promote the Governor's water efficiency and conservation goals is further demonstrated by installing landscaped areas that incorporate drought resistant plants, drip irrigation, and walkways. DSH-Coalinga installed drought-tolerant plants and replaced lawns with drought resistant landscape to reduce water dependency.

Table 4.4: Department Water Use Trends

Year	Total Occupancy /year	Total Amount Used (Gallons/year)	% Change From 2010 Baseline	Per capita Gallons per person per day
Baseline Year 2010	**15,715**	**519,807,124**		**33,077**
2018	15,715	451,973,891	-13%	28,761
2019	15,715	477,993,596	-8%	30,416
2020	15,715	519,999,500	0%	33,089[2]
2022 Goal (15% reduction from 2020)		**441,999,575**		

As referenced in Table 4.4, DSH has been diligent in its efforts to conserve water usage at its facilities by ensuring water fixtures are equipped with low flow

2 DSH-Coalinga experienced challenges with its water system and experienced leaks that attributed to water usage

appliances where possible, by striving to continue installing new plumbing technologies in all renovated and new construction projects and promptly repairing building leaks.

Relevant strategies to minimize water use across DSH's built environment focus on the design, implementation, and evaluation of facilities and outdoor water efficiency practices and equipment such as the following:

- Water Management
- Proactive leak detection and repair
- Landscape practices
- Specialty use buildings, including patient treatment and housing facilities, central utility plants, laundry facilities, and main kitchens

Table 4.5: Total Water Reductions Achieved

Total 2020 Water Use Compared to 2010 Baseline	Total 2020 Amount Used (gallons per year)	Annual Gallons Per capita 2020
20% reduction achieved	0	0
Less than 20% reduction	519,999,500	33,089
Totals	**519,999,500**	**33,089**

DSH implemented a series of measures to mitigate drought challenges.

Landscaping measures:

- Assessed and modify irrigation of essential and non-essential areas
- Implemented minimal landscape irrigation practices to sufficiently irrigate and keep vegetation alive (i.e., multiple, short-duration watering at night)
- Lawn reduction/utilization of water-efficient landscaping
- Replaced sprinkler times with earth moisture sensing devices

Facilities Operation measures:

- Increase chill water temperature and reduce steam pressure (reducing make up water)
- Inspect all closed loop heating and cooling systems for leaks
- Plant Operations staff take a proactive approach to water conservation with regular inspections, maintenance, and repairs underground water services supply lines
- Replace tube and shell heat exchangers with instant heat exchangers
- Replaced faucets, shower heads, and toilets with low-flow fixtures as facilities progress through the anti-ligature project

Staff and Kitchen Measures:

- Staff numbers have been reduced by having certain nonessential staff work from home, thus reducing water consumption by less staff using bathroom facilities on site
- Kitchens have limited in-person dining and have been feeding patients on the units
    - This has resulted in a reduction in dish washing as paper products are used in this process
    - This saves on both fresh-water usage and soft water production which has a high-water consumption for regeneration of soft water systems

DSH is exploring funding via the California State Water Conservation Grant administered by the Department of General Services Sustainability team. This grant program will allow DSH to purchase needed water conservation tools, such as water meters and irrigation controllers, to allow DSH to work towards reducing the pressure on the state's water table.

Tracking water project savings and trends for DSH is extremely difficult due to the lack of water meters at the hospital facilities. Acquiring financing to obtain water meters via the California State Water Conservation Grant isa critical step forward in DSH's water management plans.

General Water Management

DSH continues to practice general water management by:

- Tracking monthly water use manually
- Checking leak indicators on water meters when water is not in use
- Reliance on DGS water use tracking data derived from utility bills
- General water management by pursuing water conservation projects
- Drought water landscape: general reduction of water usage as mandated by the State
- Installation of low flow water fixtures and/or meters

Leak Detection and Repair

DSH hospital staff perform monthly visual leak detection surveys on all water use fixtures:

- Plumbing fixtures are (i.e., toilets, urinals, sinks) routinely visually inspected on a rotating Preventative Maintenance (PM) schedule
    - In the interim, staff are responsible for reporting leaking, damaged, or clogged fixtures via the Work Order system, or by calling Plant Operations directly
- Faucets are checked for proper aerators (kitchen faucets 2.2 gpm and lavatory faucets 0.5 gpm) and aerators or laminar flow devices are installed, if necessary
- Showerhead flow rates are checked and new showerheads that use no more than 2.0 gpm with trickle flow controls are installed, if necessary

Kitchens

- Replacing any broken or damaged dishwasher racks and run dishwasher only when full to maximize capacity
- Checking all equipment water temperatures and flow rates against the manufacturer recommendations
    - Use the recommended minimum temperature and flow to maximize savings
- Turning off the continuous flow used to wash the drain trays of the coffee/milk/soda beverage island and clean thoroughly, as needed

- Adjusting ice machines to dispense less ice if ice is being wasted
- Reducing the flow to dipper wells (troughs) for ice cream, butter scoops, and other frequently used utensils
- Presoaking utensils and dishes in basins of water, rather than in running water
- Do not using running water to melt ice in bar sink strainers
- Not using running water to defrost food
- Not allowing water to flow unnecessarily

Laundry Facilities

- Running washer only when full to maximize capacity
- Setting water level and water temperature appropriately according to the load

Table 4.6: Summary of Indoor Water Efficiency Projects Completed 2014-2020 or In Progress

Year Completed	Water (Gallons/yr.) Saved	Number of Indoor Water Efficiency Projects Completed	Cost Savings per Year
2014	0	0	$-
2015	0	0	$-
2016	26,572,582	0	$-
2017	20,000,000	0	$-
2018	19,670,000	0	$-
2019	345,290	2	$1,115.00
2020	0	0	$-
2021	0	0	$-

Building Heating and Cooling Systems BMPs

DSH has adopted the following measures included in its Maintenance and Preventive Maintenance program, and safety practices to save water and energy:

- Staff has the required expertise and knowledge to perform daily visual inspections to detect leaks in the system

    - Shut-off valves are tested annually to confirm that they close and do not leak
    - The entire fuel system is inspected for leaks and repairs
- Visual inspections for leaks in steam traps and steam lines and needed repairs are performed by facility engineers
- Boiler tuning is done annually by an outside contractor as part of the NFPA 99 and is a requirement of The Joint Commission (TJC)
- The proper insulation on steam and condensate return piping and central storage tanks is visually inspected
- Water treatment, to prevent scale and corrosion, is included in annual checks of boiler water chemistry and tested annually by an outside contractor
- The routine inspection on condensate pumps is visually inspected
- Tube surfaces are cleaned on both side and fire side of the boiler to maximize system energy efficiency
- The adjustment of boiler and cooling tower blowdown rate, to maintain Total Dissolved Solids (TDS) levels, are required for daily monitoring of the feed water quality to ensure low levels of TDS
- The existing air conditioning systems are water cooled air and are to be replaced with air-cooled systems as part of the Capital Outlay budget process
- The existing EMS gathers and organizes information for the operating staff to act and reduce energy waste

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	0	0
2015	0	0
2016	5,520	128
2017	0	0
2018	0	0
2019	0	0
2020	0	0

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

Year Funded	Water (Gallons/yr.)	Estimated Annual Cost Savings	Total Number of Projects per Year
2014	0	$-	0
2015	0	$-	0
2016	0	$-	0
2017	20,000	$2,000	0
2018	19,670	$1,800	0
2019	0	$-	0
2020	0	$-	0

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)
2014	-	-	-
2015	-	-	-
2016	7,800	100,000	100,000
2017	20,000	100,000	100,000
2018	19,670	98,000	98,000
2019	-	-	-
2020	-	-	-

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 must 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 required to have their own contingency plans in place for their building and landscaping water use 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.

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)
5	0	0

The DSH Health and Safety team developed a comprehensive three-phase plan in the event of a water shortage:

PHASE I (≤ 10% conservation)

- Initiate Department wide messaging via email and Everbridge notification system
  - Notify staff of the proclamation and link to the official document
  - Provide recommendations to reduce water use and promote conservation

        - Shut off faucet while washing hands, etc.
        - Encourage staff to promptly report all water leaks so repairs can be conducted in a timely and efficient manner to minimize waste
        - Eliminate use of water to wash down hardscaped surfaces such as concrete and asphalt
        - Limit washing of vehicles to the minimum necessary
        - Reduce overall use of water for both production and clean up in all kitchen and dining areas
    - Utilize Therapeutic Community meetings to share information with patients and include tips to reduce water use
        - Shut off faucet when brushing teeth or washing hands
        - Reduce shower times if possible
- Initiate Water Conservation Campaign
    - Post water conservation flyers near sinks and faucets

PHASE II (≤ 20% conservation)

If water reduction targets are not met in Phase I of this plan, DSH shall implement the following measures.

- Assess and modify irrigation of essential and non-essential areas
- Implement deficit landscape irrigation practices to sufficiently irrigate and keep vegetation alive (i.e., multiple, short watering at night)
- The Executive Director issues a moratorium to all departments to reduce water consumption (See recommendations in Phase I)
- Lawn reduction/utilize water-efficient landscaping

PHASE III (≤ 20-30% conservation)

All prohibitions and restrictions noted in Phase 1 and Phase 2 shall be in effect.

- There shall be no outdoor use of water at any time, except the minimal amount by handheld hose equipped with a shut-off nozzle. If no further water reduction can be made without compromising patient care and facility needs, an exemption will be requested.

No DSH Facilities are in critical groundwater basins.

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 2022	Number of clothes washers to be replaced	Number of garbage disposals to be replaced.	Number of pre-rinse valves to be replaced
675	99	100	323	35	0	10

Building Inventories Summary

As a result of the hospital-wide building inventory, a total of 1,242 items were identified as needing replacement. DSH-Napa recorded the greatest need, followed DSH-Metropolitan and DSH-Atascadero. The aggregated total replacement cost is $1,387,000. The financing will be primarily covered by ESCO at DSH-Napa, and the remaining facilities will utilize possible grant funding from DGS.

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
25,687,424	0	0	15,000	346,000

Summary of Irrigation Hardware Inventory

A total of 668,989 items were identified as needing replacement as a result of the hospital-wide irrigation hardware inventory. DSH-Metropolitan recorded the greatest need, followed DSH-Patton. DSH will leverage the California Water Conservation grant program funding stream to provide the necessary funding to fulfill the irrigation hardware needs of the hospitals.

Table 4.13: Summary of Irrigation Hardware Inventory

Number of separate meters or sub-meters needed	Number of irrigation controllers required with weather or soil moisture adjustment and flow sensing capabilities needed.	Number of backflow prevention devices needed.	Number of flow sensors to be purchased and installed	Number of automatic rain shut-off devices needed	Number of new pressure regulators needed.	Number of new hydrozones needed.	Number of new valves needed.	Number of filter assemblies needed.	Amount of drip irrigation needed (area covered SF)	Number of booster pumps needed	Number of rotary nozzles or other high efficiency nozzles needed
123	945	20	200	180	20	3000	300	0	661296	5	2900

Landscaping Hardware Maintenance BMPs

DSH follows Executive Order B-29-15, Model Water Efficiency Ordinance (MWEO), that mandates statewide water reductions to make the state more resilient to drought.

DSH facilities, where appropriate, replaced the landscape with native plants and ground covering with desert rock, as well as using water as follows:

- Traffic patterns are clearly identified with use of drought tolerant plants and ground covering to reduce the use of water
- DSH is in the process of performing an irrigation audit that includes reviewing the following items:
  - Inspection of irrigation systems
  - System test with distribution uniformity
  - Precipitation rates
  - Deficiencies in the system
  - Preparation of an irrigation schedule to shut down the system during precipitation
- Facilities report usage of recycled water against savings goals
- All facilities, except for DSH-Coalinga, use recycled water provided by the local Water District for landscape watering
  - DSH-Coalinga replaced ground covering with desert rock
  - Plants were reduced and converted to drought tolerant species
  - DSH-Napa uses limited amounts of recycled water
- Backflow prevention devices are maintained and inspected annually
- Inspections for leaks in the irrigation systems, run-offs, standing water, and over/under usage are monitored daily
- Facility landscapes are maintained by in-house personnel

- Drought tolerant plants and/or climate appropriate plants meet the water ranking of low or very low per the region requirements established by the California Department of Water Resources
- DSH follows the amount of annual applied water established by the Public Utilities requirements for new landscape projects or replanting
- DSH uses the Water Use Classification of Landscape Species (WUCOLS) when selecting plants based on the region and water needs

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.

Table 4.14: Summary of Living Landscape Inventory

Landscape >500Sq. ft.)	Turf (Sq. ft.)	Number of historical sites or memorials	MWELO landscape area (Sq. Ft.)	Climate appropriate landscape area (Sq. Ft.)
3,306,497	150,000	3	0	296

Large Landscape Water Use

Currently, irrigation is being metered in conjunction with potable water. All hospitals track and report water usage on an Excel spreadsheet based on monthly utility bills.

Historically, Plant Operations staff have been planting drought tolerant native species whenever possible and will continue this practice.

Table 4.15: Summary of Large Landscape Inventory and Water Budget

Number of Facility Sites/Locations with > 20,000 sq. ft. of Landscaping	Total Landscape Area all Facilities	Total Water Budget all Facilities	Total EPA Water Sense or Irrigation Association Certified Staff
5	3,306,497	0	0

Table 4.16 Summary of Completed Living Landscaping Water Efficiency Projects

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.)
0	0	0	0	661,296

Monitoring, Reporting and Compliance

The following is a summary of water monitoring at DSH:

- At DSH-Napa, domestic and irrigation water is metered together because the City of Napa only supplies potable water
- All hospitals track and report water usage on an Excel spreadsheet based on monthly utility bills
- Water efficiency is monitored by DGS within the ESPM system as mandated by the state

CHAPTER 5 - GREEN OPERATIONS

Greenhouse Gas (GHG) Emissions

Energy Efficiency

New buildings and major renovations beginning design after July 1, 2012, shall exceed Title 24 energy requirements by 15% or more. The goal of Title 24 is to ensure that building construction, system design, and installation achieve energy efficiency and preserve both outdoor and indoor environmental quality. These standards establish a minimum level of building energy efficiency for both residential and nonresidential buildings. A building can be designed to a higher efficiency level, resulting in additional energy savings.

DSH's five hospitals encompass nearly 6.2 million gross square feet of space in 832 buildings and roughly 2,600 acres of land. DSH carefully manages the GHG emissions generated by its facilities and equipment while continuously working to optimize and minimize energy use. DSH has been working with DGS and contracted ESCOs to conduct comprehensive energy audits of DSH facilities that will result in documented solutions for achieving energy cost reductions. ESCOs offer turn-key services for all of phases of energy efficiency retrofit projects through a single contract and assume performance risks for installed measures.

DSH has implemented energy efficiency projects to reduce plug load and consumption. Grid-based energy purchasing reduction is achieved through the installation of LEDs, photovoltaic solar panels, and modernized HVACs in various buildings at the five hospitals. Below is a summarized list of specific energy conservation measures installed to date at each of DSH facilities:

DSH - Atascadero:

- Energy Management Systems (EMS)
- Lighting upgrades to LED
- Replacement of existing cooling towers (CT) with new water efficient CTs
- Boiler controls and burner upgrades

DSH-Coalinga

- Lighting upgrades to LED
- New lighting control panels with timers that schedule on/off times in public areas and in-patient dorm rooms

DSH-Metropolitan:

- New high-efficiency Variable Frequency Drives (VFDs) for cooling tower fans
- Lighting retrofits (interior and exterior upgrades)
- High efficiency motors for Air Handling Units (AHU)
- Installation of new cool roofs on multiple buildings
- Boiler feed water pumps VFD
- Static pressure sensor controlling AHU VFDs
- Free cooling based on enthalpy, dry temperature, and AHU reset temperature set point
- Rebuild or replace steam traps

DSH-Napa:

- Lighting retrofits (interior and exterior upgrades)
- Replacement of supply exhaust fan motors with energy efficient motors
- Installation of a new, more efficient liquid oxygen system
- Installation of two new properly sized (20 horsepower) compressors for the turbines
- Turbine retrofits and upgrade to Turbotronics is underway

DSH-Patton:

- High efficiency motors for AHUs
- New high-efficiency VFDs for cooling tower fans
- Lighting retrofits (interior and exterior upgrades)
- Boiler retrofits

DSH will continue to monitor and actively track the effectiveness of its energy retrofit projects and its reduction of grid-based energy purchases for buildings by utilizing the statewide data entries submitted to ESPM and compliance with the following sustainability policies:

- California Department of Technology Policy 4819.31 related to power management practices
- Management Memo 14-07 - Standard Operating Efficiency Procedures

- Management Memo 14-09 - Energy Efficiency in Data Centers and Server Rooms
- Management Memo 15-04 - Energy Use Reduction and Reporting for New, Existing, and Leased Buildings

DSH is participating in regional demand response programs to obtain financial incentives for reducing peak electrical loads when called upon. These programs will be explored and considered to the extent that cost-effectiveness and assurances are in place to avoid adversely affecting hospital operations and patient care.

On-Site Renewable Energy

DSH is committed to making strides toward meeting the Governor's sustainability goals for reducing greenhouse gas emissions by 40% in 2030 by increasing its reliance on renewable energy. DSH is promoting the use of renewable, clean energy throughout DSH facilities by installing additional ground mounted solar units and construction of solar PV canopies in parking lots in all facilities. New or major renovated buildings over 10,000 square feet shall use clean, on-site power generation and clean back-up power supplies, if economically feasible.

Facilities with available open land are implementing large scale PV solar generation plants through various financing methods, including third party power purchase agreements (PPAs). Under these agreements, the solar provider installs solar power systems using third-party financing, then sells the renewable electricity generated by the solar panels at a competitive cost to DSH.

- DSH-Napa has a 1MW ground mounted solar canopy array and the energy savings are now reflected on the utility bills.
- DSH-Atascadero has a 1.2MW ground mounted solar canopy array that is now up and running.
- Currently, DSH is installing a 1MW ground-mounted solar array in DSH-Metropolitan and a 3.5MW solar array in DSH-Coalinga.

These on-site renewable energy projects have enabled the department to decrease its GHG emissions from 3,354,006 pounds of carbon dioxide (C02) in 2012 to 2,604,261 pounds in 2018, representing a reduction of 22.4% in six years.

Purchased Renewable Energy

DSH purchases electricity generated by the on-site solar plants at its DSH-Atascadero, DSH-Coalinga, and DSH-Patton facilities under agreements signed

with DGS and third-party vendors who operate and maintain the plants. Additionally, DSH recently entered a PPA for DSH-Napa and the new on-site solar generation system was operational by the end of 2019.

DSH is on target to expand its statewide solar energy production by 4.35 MW by the end of 2021.

Fuel Efficient Vehicles

DSH continues to decrease its consumption of fossil fuels. These savings can be attributed to new fuel-efficient vehicle technologies and the increased availability of electric and hybrid vehicles on statewide contracts. In Fiscal Year 2019-20, DSH retained a total of ten traditional hybrids and fifteen battery electric vehicles (BEV) in its fleet inventory. DSH purchased a total of six BEV cargo vans from the 2019-2020 FAP and will continue to make every effort to replace internal combustion engines with more eco-friendly options when feasible.

Zero Emission Vehicles (ZEV)

DSH has exceeded the requirements stated in Executive Order B-16-12; over 25% of the requested replacement light duty vehicles (LDV) are ZEV and PHEV. DSH has also exceeded the 50% pure ZEV requirement with the purchase of the following Battery Electric Vehicles (BEVs):

- six cargo vans
- one bus
- one heavy duty truck

Agencies must also develop the infrastructure to support increased public and private sector use of ZEVs. Below is a summary that details the measures taken to date by DSH hospitals to meet these goals and future areas of improvement:

- DSH-Atascadero utilizes four-wheel drive light-duty trucks and two ZEV vehicles for maintenance and repair of the buildings and patrolling the facility's vast rural grounds
    - These vehicles rarely go off-grounds and DSH is evaluating whether a BEV light-duty truck is available with suitable off-road features and durability to replace its traditional fossil-fuel powered trucks
- DSH-Coalinga has five PHEVs for the motor pool department to be used for mail, delivery, and transportation services, and one PHEV for OPS motor pool that is made available to the Camp San Luis Obispo (SLO) officers

    - Fleet fuel cell vehicles may also be used for transportation of employees to and from trainings, meetings, employee recruitment events, workshops, or other business-related travel
- DSH-Metropolitan owns eight ZEVs and five PHEVs
    - These vehicles are primarily used for administrative and motor-pool operations
    - ZEV vehicles are ideal for on-grounds usage where frequent idle run times are incurred, such as vehicles used to provide patient and staff shuttle services
- DSH-Napa staff currently have two BEVs, used to transport pharmaceutical and physician staff to and from patient occupied facilities
    - Two additional ZEV vans were purchased and acquired in 2020
    - Plans are in place to replace four existing vehicles each year over the next three consecutive fiscal years with PHEVs, in addition to the two current BEVs operated on campus
- DSH-Patton utilizes its fleet similarly to DSH-Metropolitan
    - One ZEV vehicle is utilized for on-grounds transportation and patient/staff shuttle services between its two separate and secured treatment areas

ZEVs are currently available on statewide commodity contracts in the sub-compact, compact, mid-size sedan, and mini-van vehicle classes. There are currently 44 vehicles in DSH's fleet that are eligible for replacement in vehicle classes for which ZEVs are available on state contract. DSH is planning to purchase a total of 20 ZEVs in the next five years. The expanded range of green vehicles available by state contract, ease of access to charging infrastructures, and reduced maintenance costs compared to vehicles using fossil-fuels, will continue to increase DSH's investments in eco-friendly green vehicles.

Biofuels

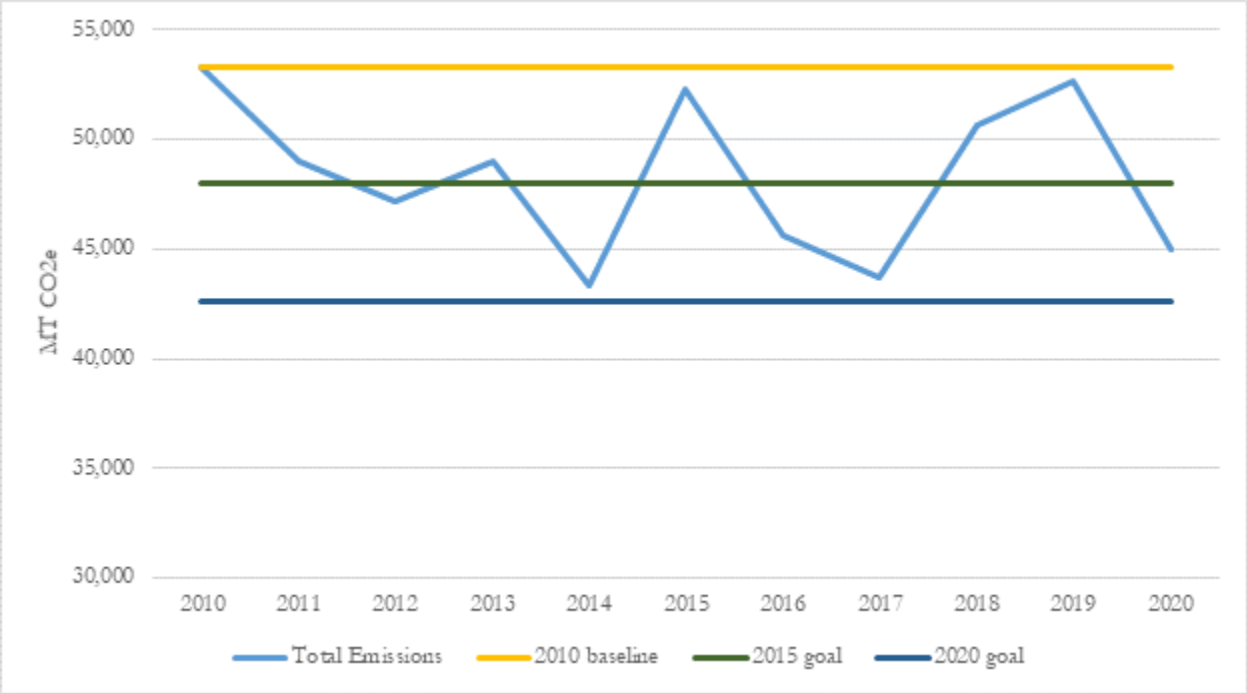
DSH does not own or operate any biofuel vehicles in the fleet.

DSH has achieved a collective 66% reduction in GHG emissions in the usage of gas, purchased electricity, and vehicles since 2010 as reported in Table 5.1

Table 5.1: GHG Emissions since 2010

Emissions Source	2010 Baseline	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	% Change since Baseline
Natural gas	29,963	26,169	25,200	27,717	24,845	28,050	27,546	26,365	35,156	43,552	28,888	**0%**
Vehicles	1,274	1,651	1,262	1,377	962	1,048	1,198	1,334	1,374	1,550	1,631	**28%**
Purchased Electricity	22,071	21,201	20,729	19,910	17,514	23,147	16,892	16,017	14,106	7,567	13,453	**-39%**
Total	53,282	49,020	47,191	49,003	43,321	52,245	45,636	43,716	50,536	52,669	44,972	**-16%**

Graph 5.1: GHG Emissions since 2010



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. The following new buildings were designed to exceed Title 24 by 10 to 15%:

DSH-Napa - New Main Kitchen

Completed November 2017

The DSH-Napa New Main Kitchen project consists of a new single-story, 29,000 gross square foot central kitchen facility. The project scope included abatement and demolition of existing structures, site clearing and grubbing, earthwork, excavation, and underground utilities. Site improvements included landscape and irrigation, walks, curbs, gutters, and parking. The building is a concrete slab on grade, steel structure, with plaster exterior and a single-ply roof with skylights. Special features include new kitchen equipment, high-capacity food storage racks, large refrigerator, and freezer walk-ins, and loading docks with overhead coiling doors. Finishes include epoxy flooring, ceramic tile, carpet tile, gypsum board, and acoustical ceilings. Additional features include a card key access system, CCTV, and diesel power engine generator.

According to the Code Analysis in the Construction Documents, building design exceeded Title 24 by 10% and is rated "Silver" in Leadership in Energy and Environment Design (LEED).

DSH-Metropolitan - New Visitor Building

Completed August 2019

The DSH-Metropolitan New Visitor Building project consists of a single-story, 3,904 gross square foot Visitor's Center building, over 4,500 linear feet of security fencing complete with lighting and camera systems, vehicular sally ports, an enclosed recreational park area with restroom facilities, a parking lot for staff and visitors, as well as five new security posts along the improved perimeter fence. The Visitor's Center building contains two control rooms serving the sally ports, a large visiting room, several private visiting rooms, several restrooms for visitors and patients, as well as support spaces for equipment serving the Visitor's Center, and fence-line lighting and cameras.

The design was done with energy efficiency in mind. Wall insulations and windows meet energy code requirements for building envelopes while conforming to special security standards required for this site. The rooftop packaged air-conditioning unit specified exceeds the minimum required efficiency per Bureau of Energy Efficiency (BEE) section 110.2. Similarly, the lighting systems utilize the latest in LED technology, as well as sensors, dimmers, and timers to maximize energy savings. The installed indoor lighting system wattage exceeds the

applicable Title 24 energy requirements by over 30%. The building is also equipped with solar tubes which direct sunlight into the rooms during daytime and reduce the need for lighting.

The outdoor fence security lighting utilizes efficient LED fixtures that exceed the efficiency of similar security lighting installations. The outdoor fixtures are equipped with photocells to ensure energy savings during daylight.

DSH-Patton - New Main Kitchen

Completed September 2019

The project consisted of a new single-story, 36,500 gross square foot central kitchen facility. With similar site improvements and amenities as the DSH-Napa New Main Kitchen, its design exceeded Title 24 by 10% and achieved LEED Silver rating.

Table 5. 2: New Construction since July 1, 2012

Facility Name	LEED Certification Type & Level Achieved	Commissioning Performed (Y/N)
DSH-Napa – New Kitchen	LEED-NC Silver	Y
DSH-Patton – New Kitchen	LEED-NC Silver	Y
DSH-Metropolitan – Newitchen	LEED-NC Gold	Y
DSH-Metropolitan – Newisitor Building	None	N

LEED for Existing Buildings Operations and Maintenance

The U.S. Green Building Council's LEED program consists of several rating systems that provide guidance on how to adopt green-design measures and measure compliance levels. Current LEED point systems are in place for existing buildings to establish current performance levels and identify improvements. Measures taken to date to achieve LEED Existing Building Operations and Maintenance (EBOM) certification across DSH facilities have been limited due to competing facility repair needs.

For example, DSH's Atascadero, Napa, Metropolitan, and Patton facilities have several buildings well over 60 years old that exceed 50,000 gross square feet. Given the age of its structures and infrastructure, estimates to conduct LEED-

EBOM surveys at DSH facilities are costly and could exceed millions of dollars to complete. Most of DSH's buildings are too old to effectively meet LEED requirements. The cost of meeting requirements in most cases would likely exceed the cost to design, build, and occupy a new sustainably designed building.

Based on its aging infrastructure, DSH has extensive capital improvement needs including seismic retrofits, security improvements, fire-life-safety upgrades, infrastructure replacement, and new construction projects. DSH, however, is working with DGS, through their ESCO program, to conduct energy audits at its five campuses for identification of potential retrofit projects which will help boost the energy performance at all DSH facilities.

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
0	0	0

Indoor Environmental Quality

New Construction and Renovation

Agencies are to comply with the requirements of Management Memo 14-05, which ensures healthy indoor environments for occupants of new and major renovated buildings by implementing relevant and practical CALGreen code Indoor Environmental Quality (IEQ) measures.

IEQ relates to the livability conditions inside a facility that encompass air quality, access to daylight and views, acoustic conditions, and thermal comfort.

DSH has extensive capital improvement needs, including seismic retrofits, security improvements, fire-life-safety upgrades, infrastructure replacement, and new construction projects. Achieving significant advancement toward IEQ measures hinges of the Department's ability to pursue new construction and major renovation projects to replace older infrastructure and expand capacity. DSH has undertaken a statewide Infrastructure Master Plan to evaluate the performance and suitability of DSH's 832 buildings for efficient continued use. The Facility Condition Assessments currently being developed will identify and

prioritize future development plans at each of the five hospitals and offer sustainable design recommendations for maximizing IEQ.

DSH currently facilitates quality IEQ through high-quality designs, construction, and its operating and maintenance practices. For example, DSH is currently in the process of planning roof replacement projects at DSH-Metropolitan, DSH-Atascadero, and DSH-Napa, including an upgrade of the affected air handling units (AHU). CALGreen and all applicable IEQ requirements have been factored into the plans and specifications of these projects.

IEQ standards are also prerequisites to achieving LEED certification, and DSH will factor in CALGreen and commissioning requirements as standard considerations for new construction and renovation projects. For example, the IEQ measures that meet the Volatile Organic Chemical (VOC) content limits specified in CALGreen are incorporated into construction specifications for new projects and a component of DSH's Five-Year Capital Outlay plan, including:

- Adhesives
- Fabrics
- Sealants
- Caulking
- Paints
- Coatings
- Aerosol paints
- Carpet systems
- Carpet cushions
- Wall panels
- Resilient flooring
- Thermal insulation
- Acoustical ceilings
- Composite wood products

Furnishings

Employee comfort, health, and work performance goes hand in hand IEQ. Furniture affects IEQ through the availability of ergonomics, the air contaminants or toxins produced, and its adaptability to absorb organizational churn. DSH promotes sustainable workplace standards by incorporating furniture that is adjustable and flexible enough to support multiple tasks and users. Furniture layouts are intended to optimize daylight, views, and air flow for occupants, while

furniture/fabric selections focus on products that allow DSH to earn points towards future LEED certification by using the following:

- Low VOC emitting materials
- Recycled content
- Local or regional materials
- Forest Stewardship Council (FSC) certified wood products

DSH's practices rely on the DGS "Buying Green Guide" for information, tools, and tips on the state's best practices related to the procurement of green products and services. The DSH designated Procurement and Contracting Officer (PCO) is responsible for confirming DSH's statewide compliance with the DGS EPP program and all other state contracting guidelines and statutes that govern the acquisition process, including but not limited to, the California Environmental Quality Act (CEQA) guidelines, executive orders, and industry best-practices.

Cleaning Products

Eco-friendly cleaning products and services play a critical role in DSH's Green Building Cleaning program. SAM Section 1825.4 requires agencies to use indoor products and materials that emit little or no harmful chemicals and meet Green Seal (GS) Standard GS-37 related to "Cleaning Products for Industrial and Institutional Use", including general-purpose, restroom, glass, carpet cleaners, and biologically active cleaning products used for routine cleaning.

DSH practices rely on EPA recommendations, the DGS EPP "Buying Green" guidelines, and Department of Toxic Substances Control (DTSC) "Safer Consumer Practices" for assistance in meeting environmental green cleaning performance standards and understanding eco-labels. All products are checked against the Green Seal criteria to ensure compliance before purchase. DSH hospitals also ensure safe, convenient, and secure spaces are created for storage of housekeeping chemicals.

DSH remains an active participant in DGS' Sustainable Purchasing Stakeholder Forum to ensure DSH policies and procedures contribute to future LEED certification, are strategically aligned with industry best practices, executive orders for green cleaning, and State EPP goals.

Cleaning Procedures

Green cleaning procedures minimize the environmental and health concerns associated with conventional cleaning practices. Cleaning products can also contribute to indoor air quality problems as VOCs evaporate and are circulated through the building's ventilation system.

DSH also recognizes that its standard operating procedures must be effective to protect vulnerable building occupants, especially during the COVID-19 pandemic. The development of requirements for staffing and training of maintenance personnel must be appropriate for the needs of the building and comply with California Code of Regulation (CCR), Title 8 Section 3362 related to the standards for sanitation.

Provisions for continuous improvement are critical as procedures, processes, and housekeeping manuals at all DSH facilities must consider the following:

- Building exterior and site maintenance programs (including reviewing plans for preventing water intrusion and managing hazardous spills/incidents)
- Efficient and optimized use of energy and water
- Purchase of sustainable cleaning equipment
- Purchase of environmentally preferred products
- Waste stream management
- Integrated pest management
- Ongoing IEQ and LEED goals
- Green cleaning best practices
- Promoting hand hygiene and availability of hand sanitizers

HVAC Operation

DSH facilities operate 24 hours per day, seven days per week, 365 days per year. DSH relies on its Plant Operations teams to ensure heating, ventilating, and air-conditioning (HVAC) systems are compliant with the provisions of SAM 1825.4 and operate as design-intended, to:

- Prevent infectious disease transmission
- Maintain comfortable indoor climates among patient occupied areas and staff workspaces
- Prevent premature equipment failure
- Avoid poor IEQ and increased energy and maintenance costs

AHUs are central air conditioners that handle the air supplied into the buildings by the ventilation ductwork. Most units operate with minimum outdoor air as allowed for energy efficiency per Title 24 section 120 related to energy efficiency and Cal OSHA's Title 8 regulations, section 5142 related to minimum building ventilation. Energy Management Systems (EMS) are also installed at each of DSH's facilities, which ensures that minimum outdoor air requirements, set per design criteria, are provided in unison with exhaust and return air ratios.

Maintenance is scheduled at various intervals for different equipment depending on manufacture's recommendations. HVAC ducts, filters, and auxiliary equipment are routinely inspected and maintained. Periodic duct cleaning also ensures prevention of microbial growth. Dampers and actuators are checked during regularly scheduled inspections along with heat exchangers. Most DSH facilities contract out for maintenance of the cooling towers, the water chemistry, and control of microbial growth. Additionally, all DSH facilities have Building Automation Systems (BAS) in place, which monitor facility-wide HVAC systems and components as part of the program.

In 2020, DSH executed a statewide contract for mechanical engineering services to perform walk-throughs of mechanical rooms in all Patient Housing Building HVAC systems and develop reports. Testing, adjusting, and balancing (TAB) technicians took readings of all HVAC equipment and analyzed each mechanical system. The information in these reports will be reviewed and assist in the development of a plan to ensure that Patient Housing Building HVAC systems at all five hospitals are equipped to handle required airflows to accommodate COVID-19 patients and help prevent the spread of the virus.

Integrated Pest Management

The key elements of DSH's pest management strategies rely on standard operating procedures that focus on the following proactive measures:

- Regular site inspections to determine the types and infestation levels of pests
- A record-keeping system to document trends and patterns in pest outbreaks
- Establishment of action plans for specific pests
- Preventive measures as the primary means of pest control
- Criteria to identify the least-toxic material to be used
- Regular evaluation to determine the effectiveness of the program

DSH's Integrated Pest Management (IPM) program preferentially requires non-chemical approaches. Higher-tiered pesticides are used only after monitoring indicates they are needed (according to established guidelines and treatments) to remove the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

DSH-Coalinga and DSH-Metropolitan rely on Vector Control Technicians (VCT) to manage IPM programs at some of its facilities. VCTs are civil service classifications that hold a professional license issued by the California Structural Pest Control Board which requires IPM compliance and continuing education. VCTs train maintenance staff and contractors on identification, treatment, and prevention of pests, techniques for establishing and maintaining a written program, and instituting green practices using IPM preferred techniques.

Table 5.4: Pest control contracts

Pest Control Contractor	IPM Specified (Y/N)
DSH-Atascadero - Pestmaster Services, Inc.	Y
DSH-Napa - EagleShield Pest Control, Inc.	Y
DSH-Patton - A Tovar Termite and Pest Control	Y

Waste and Recycling Programs

- All recycling efforts are examined with by the recycling teams at each hospital. DSH utilizes Govdeals to recycle items and reduce material going into the landfill. We have contracts for recycled items, such as metal, e-waste, organic food waste and textiles. We also have a mattress and pillow recycle contract
- At each hospital, reports regarding tonnage are compiled by using the waste and recycle billing reports from contracted vendors.

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

Location	Per Capita Baseline	Per Capita 2019	Per Capita 2020	Total Waste 2019	Total Waste 2020	% Change from 2019/2020
DSH-Atascadero	2.1	4.15	5.81	548.26	685.73	+25%
DSH-Coalinga	2.1	9.36	9.62	1451.75	1532.40	+5%
DSH-Metropolitan	2.1	12.24	11.49	1337.43	1172.24	-12%
DSH-Napa	2.1	8.62	6.42	1489.85	1000.33	-33%
DSH-Patton	2.1	7.46	7.02	1443.67	1318.27	-9%

- Waste and slop bins are picked up weekly or bi-weekly by the vendors. As standards change and contracts are due, the language is incorporated into the new contract.
    - All DSH hospitals are meeting the target standards

Recycling

DSH facilities makes every effort to recycle items such as beverage containers, glass, paper products, plastics, etc.

- **DSH-Atascadero**
    - Utilizes a hauling company for recycled paper, cardboard, plastics, miscellaneous metals, and organics
    - E-Waste and toner cartridges are recycled by PIA
    - GovDeals is utilized to sell unused or end of life surplus property to avoid being discarded into the landfill
    - Mattress and pillows are recycled
    - All towels, washcloths, blankets, and sheets are given to Plant Operations to be utilized as rags

- 100% of all remaining textiles are recycled
- Rendering is recycled
- Hazardous waste is picked up and hauled away
- Office supplies and property are re-utilized throughout the facility
- Standard language is used to purchase goods to vendors providing the recycle content of items

- **DSH-Coalinga**
  - Contracts are in place to pick up e-waste and hazardous materials
  - Automobiles are sent to state auctions
  - Major equipment is sent to DGS for sale online
  - Items no longer needed are sent to other facilities or schools
  - Mattresses are recycled

- **DSH-Metropolitan**
  - Surplus property is used whenever feasible
  - Equipment is reutilized internally or General Services either recycles or donates items to be used elsewhere
  - Records are stored and archived electronically
  - Boxes, pallets, and packing materials are reused by warehouse staff throughout the facility
  - Retreaded tires and used vehicle parts are used whenever price and availability are comparable
  - Recycled content products are used, and suppliers are required to certify the minimum post-consumer recycled content

- **DSH-Napa**
  - Recycling program in place to divert e-waste and hazards to the appropriate recycling centers
  - Blue recycle bins are set up throughout the facility to collect paper materials to be recycled regularly
  - Towels from the laundry department are recycled into cleaning rags for janitorial staff
  - Materials exchange is promoted by reusing and checking with State surplus prior to purchasing
  - Procurement consults with the Property department for available furniture prior to purchasing
  - Emphasis is on obtaining green products that meet the recycle percentage requirement
  - State Agency Buy Recycle Campaign (SABRC) information is reported on FI$Cal for all purchases that contain recycle materials

DSH-Patton

- Collection sites and contracts with outside service providers are utilized for collection, recycling, and disposal
- Universal waste items such as electronic devices, microwaves, batteries, and fluorescent lightbulbs are disposed by the e-waste contractor
- Hazardous wastes, including medical and pharmaceutical waste, antifreeze, cooking oil, and motor oil, are collected and disposed of by outside contractors

One of the biggest barriers affecting DSH hospitals' ability to recycle materials has been the COVID-19 pandemic. Many companies utilized by the hospitals ceased the pick-up of materials, forcing the facilities to utilize outside contractors.

- **DSH-Atascadero**
  - Continue to research recyclers for food soiled paper for disposable trays for the dining areas
  - Paper trays, bowls, and cups increased drastically in 2020 due to COVID as all patients were served 3 meals per day for approximately 8-9 months in their units rather than in dining area
  - PIA ceased pick-up of e-waste and toner cartridges

- **DSH-Coalinga**
  - The location of the hospital makes it difficult to find vendors to bid or come out to the facility
  - Staff needed to properly sort, and separate recyclable or disposable materials is limited
  - Resource Management needs better oversight

- **DSH-Metropolitan**
  - Seek best practices from other hospital recycling programs consistent with SB 1383 including exploration of equipment and staffing resources to support organic waste recycling.

- **DSH-Patton**
    - Local solid waste contractors have not provided a reasonable solution or cost benefit to reuse or repurpose these types of materials such has motor oil, anti-freeze, cooking oils, etc.

Organics Recycling

DSH abides by AB1826 (Chesbro, Chapter 727, Statues of 2014), which requires that state agencies arrange for recycling services for the following types of organic material:

- Food Waste
- Green Waste
- Landscape and pruning waste
- Non-hazardous wood waste
- Food-soiled paper

This law requires that each state agency recycle organic material on or by the following dates based on number of materials generated:

- 8 or more cubic yards of organic material per week – April 1, 2016
- 4 or more cubic yards of organic material per week – January 1, 2017
- 4 or more cubic yards of solid waste per week – January 1, 2019
- 2 or more cubic yards of solid waste per week, if statewide disposal of organic waste is not decreased by half – January 1, 2020

Note: Solid waste means trash, recycling, and organics. This is different than AB 341, which is trash only.

Hazardous Waste Materials

- Exchange, re-use
- DSH goal is to reduce trash to be sent to landfills, incinerators, or the ocean
- DSH uses the Materials Exchange network. It is a free service that links organizations that have reusable goods they no longer need to those who can use them
- For re-use and recycling, several methods are used:
    - Incineration
    - Recycling - materials put into recycling bins get a new purpose after being processed

    - DSH provides blue bins for recycling of paper, lithium battery, glass and metal, gallon jugs, magazines, and plastic
    - Dead plants, fruit and vegetable scraps can be recycled through decomposing
    - Sanitary landfill
- Food Service
- DSH Food Services uses food storage bags made of food-safer silicone instead of plastic containers and durable handheld and bulk containers, pallets, shipping racks, and others related items intended to be re-used
- The procedure, process, and criteria to determine what types of food service packing are reusable takes into consideration different food diets required by patients

Material Exchange

DSH uses state-offered reutilization programs, managed and maintained by DGS, to promote the exchange and reuse of unwanted or surplus materials and fleet assets. 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, the reduction of greenhouse gas emissions, purchasing costs, and disposal costs.

Waste Prevention/Reuse

The state-offered programs in this section support DSH as (a) waste prevention: actions or choices that reduce waste and prevent the generation of waste in the first place; and (b) reuse: using an object or material again, either for its original purpose or for a similar purpose, without significantly altering the physical form of the object or material.

Training and Education

DSH-Atascadero

- Hospital General Services Administrator (HGSA) II and Housekeeping supervisors educate staff on how to separate recycling
- Vendor and procurement information is included as standard language when purchasing goods and services
- Recycling meetings are held to discuss logistics and recycling efforts
- Staff Appreciation BBQ is used as a recycling event for all water bottles, soda cans, organic food waste, and cardboard to promote recycling

DSH-Coalinga

- Education is provided to staff on how the benefits of recycling
- Suppliers know how important it is to use recycled materials and that, as a state agency, it helps them to get more agencies to buy from them

DSH-Metropolitan

- Dedicated recycling staff
- Signage (signs, posters, labels for recycling bins)
- Employee training
- Adequate number and condition of receptacles
- Web page - intranet and internet
- Distribution of brochures, flyers, newsletters, publications, newspaper articles/ads
- Automated Procurement Training Tracking System
- Staff Recycled-Content Procurement training
- Requirements in place for the Recycled-Content Product Certification for all purchases

DSH-Napa

- The recycling receptacles and signage at the facility clearly indicate the separation of products that can, or cannot, be recycled
- Staff have attended the CalRecycle webinar to gain knowledge of current recycling regulations
- Dedicated staff in place to collect recyclable materials and organizes them for recycling
- Procurement staff have business contracts with vendors who are able to provide green products and services

DSH-Patton

- All collection receptacles are in areas where maximum collection of recyclables is achieved
- All receptacles are clearly marked with either a designated color or signage stating the type of recyclables accepted in each container

Foodservice Items

DSH foodservice operations currently include cook/chill systems to ensure that food is delivered and served within health and safety standards.

Environmentally Preferable Purchasing

Reducing Impacts

DSH is committed to reducing the environmental impact of goods and services purchased. DSH's designated PCO is responsible for promoting statewide compliance with the DGSEPP and all other state contracting guidelines that govern the procurement process, including but not limited to, the California Environmental Quality Act (CEQA) guidelines, executive orders, other policies and standards.

DSH is committed to reducing the environmental impact of the goods and services purchased statewide. DSH promotes EPP by purchasing items that are cost effective, competitively priced, and primarily made with post-consumer recycled content as reflected in Tables 5.5. Table 5.6 details departmental efforts to buy paint, IT goods, janitorial supplies and cleaners, paper products, desk lamps, office equipment, and toner cartridges under EPP guidelines. In addition, DSH utilizes the DGS "Buying Green Guide" for information, tools, and tips on the state's best practices related to the procurement of green products and services.

Measure and Report Progress

Executive Order B-18-12 and the Green Building Action Plan directs agencies to use environmentally preferable products when compared with competing goods that serve the same purpose whenever they are applicable, perform well, and are cost-effective per Public Contract Code 12400. DSH facilities are vigilant in reviewing purchases and, when appropriate, buyers direct the selection of postconsumer content products. Additionally, DSH is buying recycled products in bulk to meet hospitals' emergent needs, further promoting EPP compliance. Each DSH facility individually tracks the reportable and compliant dollars for State Agency Buy Recycled Campaign (SABRC) category items purchased by on-site maintenance personnel and other hospital staff.

To date, the top commodities procured for hospital usage are:

- PC desktops/printers/copiers
- Paper

- Recycled paint
- Paper products

For continuous improvement opportunities, DSH will conduct an analysis of all its acquisition activities to identify environmental, social, and economic impacts by purchasing category. This future spending analysis will enable DSH to prioritize strategies to improve sustainable purchasing practices. DSH will further incorporate EPP in its statewide procurement processes by resolving any technical barriers, negative perceptions of purchasers, and end-users of green products. Statewide policies and standard operating procedures will be developed that are aligned with this goal.

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

Product Category	SABRC Reportable Dollars	SABRC Compliant Dollars	% SABRC Compliant
Antifreeze	$ 30,075.90	$ 28,687.90	95.4%
Compost and Mulch	$ 0.00	$ 0.00	-0-
Glass Products	$ 20,949.48	$ 20,949.48	100.0%
Lubricating Oils	$ 34,662.19	$ 34,662.19	100.0%
Paint	$ 10,877.42	$ 10,323.50	94.9%
Paper Products	$ 632,794.42	$ 511,159.05	80.8%
Plastic Products	$ 979,781.04	$ 714,917.02	73.0%
Printing and Writing Paper	$ 527,728.35	$ 442,491.33	83.8%
Metal Products	$1,885,358.28	$1,706,640.21	90.5%
Tire Derived Products	$ 131,254.77	$ 130,980.60	99.8%
Tires	$ 36,484.09	$ 36,484.09	100.0%

Table 5.7: Commodities categories with the greatest Potential to Green

Commodity	2020 Total Spend ($)	2020 % EPP Spend (%)	EPP Target (%)
Paper	$527,728.35	83.8%	100%
Recycled Paint	$ 10,877.42	94.9%	100%
Paper Products	$632,794.42	80.8%	100%

Sustainability Development and Education

Total Number of Employees Assigned as Buyers: **38**

Table 5.8: Buyers who have completed EPP Training

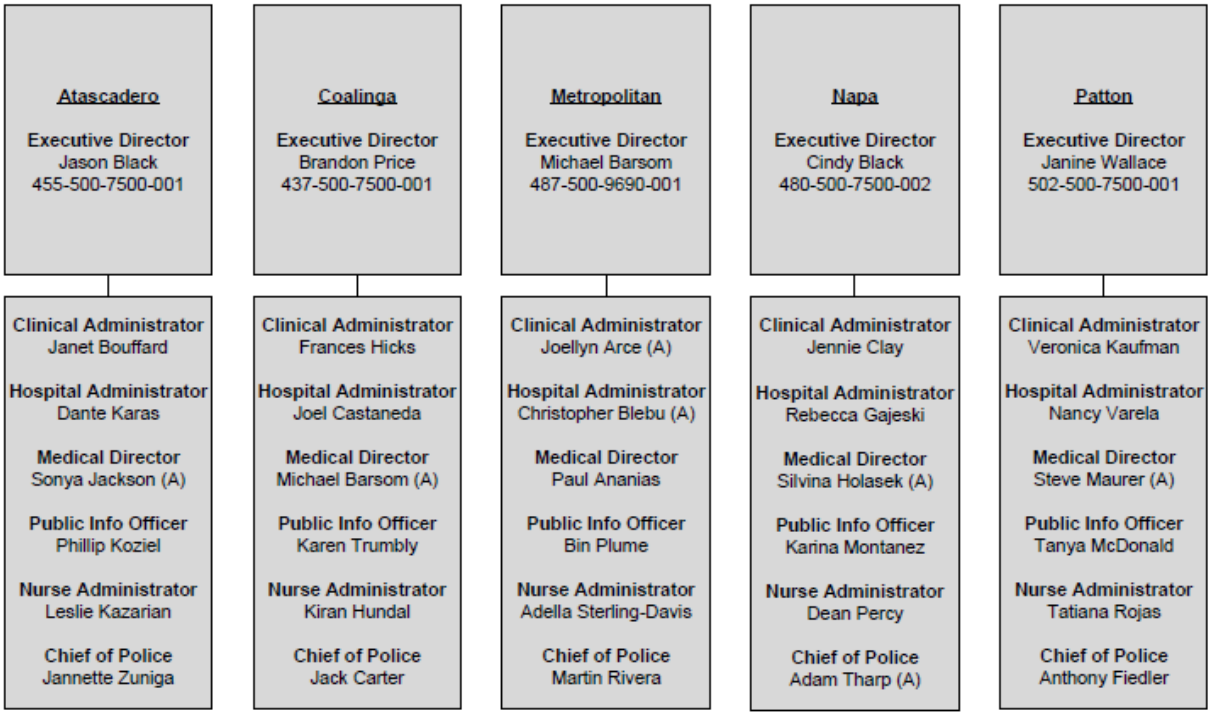
CalHR Classification	Total Number of Buyers	% Completing EPP Training	Commitment to have buyers complete EPP training (%)
Office Technician/Staff Services Analyst/Associate Governmental Program Analyst	Atascadero: 16 Coalinga: 1 Metropolitan: 5 Napa: 6 Patton: 5 Sacramento: 1	Atascadero: 1 Coalinga: 0 Metropolitan: 0 Napa: 0 Patton: 100% Sacramento: 0	100
Management Services Technician	Metropolitan: 1	Metropolitan: 0	100
Registered Nurse	Atascadero: 1	Atascadero: 0	100
Dental Assistant	Atascadero: 1	Atascadero: 0	100
Assistant Hospital Administrator	Patton: 1	100%	100

Location Efficiency

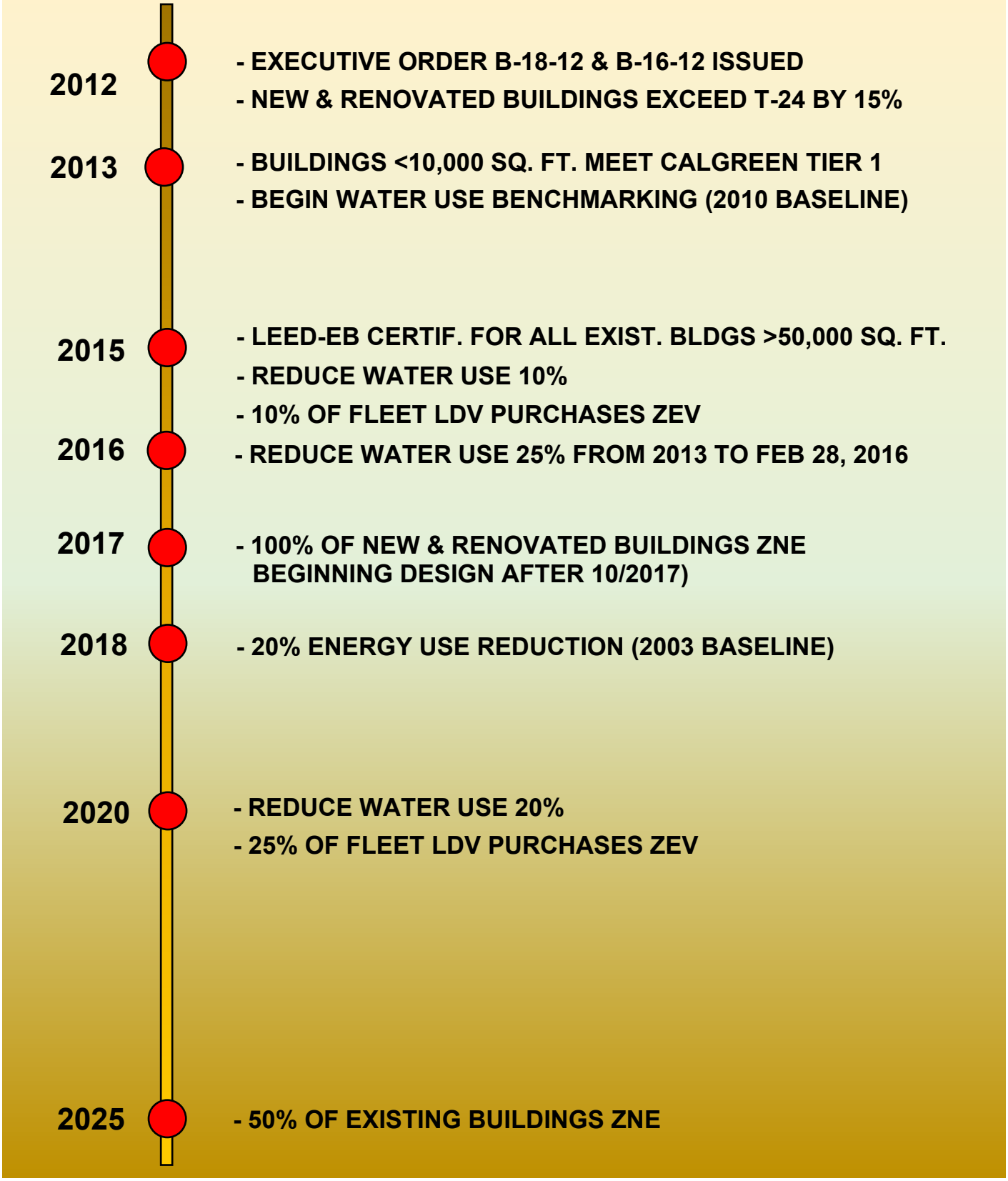
Does not apply to DSH.

Appendix A – Sustainability Leadership

Department of State Hospitals
STATE HOSPITALS
January 1, 2022



Appendix B - Sustainability Milestones &Timeline



Appendix C – Roadmap Checklists

1 - Climate Adaptation Roadmap Checklist

Policy References: Executive Order B-30-15

Executive Summary:

☐ Summary of status and actions underway to meet sustainability objectives related to climate adaptation.

☐ Include summary of changes from previous roadmap.

(This executive summary can be a paragraph in a single, comprehensive executive summary including all roadmap chapters if combined into one document.)

Past Performance:

- ☐ Describe how screening process will integrate facility operations and planning processes
- ☐ Describe approach and steps taken to integrate climate considerations in planning and investment, and how this will address changes
- ☐ Use Cal-Adapt to collect data and characterize anticipated climate change
- ☐ Report Top 5 facilities most affected by changing temperature in Table 1.2a
- ☐ Discuss how temperature and extreme heat events affect your facilities and operations, and what facilities and regions are most affected
- ☐ Describe strategies to reduce impacts of changing temperatures
- ☐ Describe ways you could employ natural infrastructure to reduce risks of climate change
- ☐ Report facilities located in disadvantaged communities in Table 1.5 and discuss how these facilities can interact with the community or serve as a resource

☐ Report facilities located in urban heat islands in Table 1.4

☐ Describe whether these facilities have large parking lots or impervious surface

☐ Describe actions that can be or are being taken to reduce urban heat island affect at these facilities

Future Planning:

☐ Report five facilities that will experience the largest increase in extreme heat events in Table 1.1

☐ List facilities most impacted by projected changes in precipitation in Table 1.5, and describe strategies to reduce these impacts

☐ Identify facilities at risk from rising sea levels in Table 1.6

☐ Discuss actions that can be taken to minimize risks of sea level rise

☐ List facility climate risks in Table 1.10

☐ Identify new facilities anticipating future extreme heat events in Table 1.10

☐ Discuss how new facilities siting, design, construction and operation are accounting for these changing conditions

☐ Report new facilities and disadvantaged communities and urban heat islands in Table 1.11

☐ Describe how climate change will affect useful life of each planned facility

☐ Verify the integration of a Climate Change Plan into department planning in Table 1.12

☐ Verify the engagement and planning processes in Table 1.13

☐ Report if climate change is integrated into funding programs in Table 1.14

☐ Describe what climate impacts are of most concern to your facilities and plans, and how department will track how they are changing

☐ Describe which office or branch will develop a policy to integrate climate change into infrastructure, how it will prioritize, and when the policy will be completed

2 - Zero-Emission Vehicle Roadmap Checklist

Policy References: EO B-18-12, EO B-16-12, 2016 ZEV Action Plan

Executive Summary:

- ☐ Summary of status and actions underway to meet sustainability objectives related to fleet operations and Zero Emission Vehicles.
- ☐ Include summary of changes from previous roadmap.

(This executive summary can be a paragraph in a single, comprehensive executive summary including all roadmap chapters if combined into one document, signed by the department executive director.)

Department Fleet Status:

- ☐ Describe fleet composition and uses
- ☐ Edit Graph 2.1 to reflect Department fleet vehicle composition
- ☐ Edit Graph 2.2 to reflect Department light duty vehicle fleet composition
- ☐ Edit Graph 2.3 to reflect Department medium and heavy-duty vehicle fleet composition

Past Performance:

- ☐ Report all prior year Total Purchased Fuel in Table 2.1
- ☐ Describe any successes or challenges encountered by your department as it seeks to incorporate ZEVs into its portfolio
- ☐ Report on department light duty fleet eligible for replacement in Table 2.2
- ☐ Report recent and planned light duty ZEV fleet additions in Table 2.3
- ☐ Report on facilities with parking and whether hosting fleet vehicles & modify Graph 2.2 to reflect this

Future Planning:

- ☐ Identify facilities with the most urgent need for EV charging in Table 2.4

- ☐ Describe department's engagement with utility and other funding programs for EVSE's and infrastructure
- ☐ List any hydrogen fueling stations that could serve as any primary refueling stations for fleet vehicles, and any plans to install hydrogen refueling infrastructure at department facilities
- ☐ List site and infrastructure assessment results for ZEV parking in Table 2.5
- ☐ Describe plan to design, bid, construct and activate EVSE infrastructure
- ☐ Describe department's operation plan for EVSE infrastructure and how it will collect and report EVSE use data and maintain equipment
- ☐ Identify department stakeholders for ZEVs and EVSE efforts in Appendix

3 - Energy Efficiency Roadmap Checklist

Policy References: EO B-18-12, MM 14-07, MM 14-09, MM 15-04, MM 15-06, MM 17-04

Executive Summary:

☐ Summary of status and actions underway to meet sustainability objectives related to energy use and efficiency.

☐ Include summary of changes from previous roadmap.

(This executive summary can be a paragraph in a single, comprehensive executive summary including all roadmap chapters if combined into one document, signed by the department executive director.)

Department Energy Status:

☐ Describe mission of your department

☐ Describe built infrastructure supporting department mission that consumes energy (electricity, natural gas, propane, etc.). Include number and total square footage of department facilities.

☐ Complete summary of actions and timeframes to meet requirements (can be bullet points)

Past Performance:

☐ Report 2020 Total Purchased Energy in Table 3.1

☐ List department properties with largest energy consumption in Table 3.2

☐ Describe any successes or challenges encountered by your department and solutions as it seeks to achieve energy efficiency

☐ Identify specific challenges to achieving ZNE, T-24+15%, reducing grid-based energy, demand response, renewable energy, or monitoring-based commissioning

☐ Describe department's 5-year capital improvement program

☐ List department zero net energy buildings in Table 3.3 and department's plans to achieve ZNE at 50% of building portfolio area

☐ Report department wide energy trends in Table 3.5

☐ Report yearly energy surveys in Table 3.7

☐ Discuss energy survey status and efforts over past 5 years

Future Planning:

☐ Describe efforts to reduce plug loads and comply with energy standard operating procedures

☐ List status of new buildings exceeding Title 24 by 15% in Table 3.4, and describe strategy for ensuring this minimum level of efficiency in future

☐ Identify department energy projects in Table 3.6

☐ Identify department demand response in Table 3.8

☐ Describe demand response programs available, and positive or negative experiences or lessons learned, and department benefits for participation

☐ Discuss steps department is taking to implement DR in more buildings

☐ Identify department on-site renewable energy in Table 3.9

☐ Discuss proposed increases in on-site renewable energy

☐ Report department planned Monitoring-Based Commissioning (MBCx) projects in Table 3.10

☐ Summarize department's MBCx experience, challenges, successes, and whether MBCx is incorporated as required, or plans to implement

☐ Discuss how energy efficiency Best Management Practices have been implemented, how they were institutionalized, and quantify repairs and replacements with estimated energy savings, if possible.

☐ Describe department steps to finance energy goals and requirements, and what programs it us using

4 - Water Efficiency and Conservation Roadmap Checklist

Policy References: Executive Order B-37-16

Executive Summary:

☐ Summary of status and actions underway to meet sustainability objectives related to water efficiency and conversation.

☐ Include summary of changes from previous roadmap.

(This executive summary can be a paragraph in a single, comprehensive executive summary including all roadmap chapters if combined into one document.)

Past Performance:

☐ Describe built infrastructure supporting department mission that consumes purchased water. Include number and total square footage of department facilities.

☐ Report all 2020 Total Purchased Water in Table 4.1

☐ List department properties with largest water use per capita in Table 4.2

☐ List facilities with largest landscape areas in Table 4.3

☐ Describe any successes or challenges encountered by your department, and solutions as it seeks to achieve water efficiency and conservation

☐ Report department wide water use trends in Table 4.4

☐ Report total water reductions achieved in Table 4.5

☐ Describe major water efficiency project over past five years or underway

☐ Identify indoor water efficiency projects in Table 4.6

☐ Identify boilers and cooling systems projects in Table 4.7

☐ Identify landscaping hardware water efficiency projects in Table 4.8

☐ Identify living landscaping water efficiency projects in Table 4.9

Future Planning:

- ☐ Report the number of buildings with urban water shortage contingency plans and in critical groundwater basins in Table 4.10, and discuss steps to reduce water use in those facilities
- ☐ Identify building inventory interior fixture needs in Table 4.11
- ☐ Summarize water using boilers and cooling systems inventory in Table 4.12
- ☐ Identify irrigation hardware inventory in Table 4.13 and discuss how replacements will occur
- ☐ Identify living landscape inventory in Table 4.14 and discuss results
- ☐ Identify large landscape inventory and water budget, as well as certified staff in Table 4.15
- ☐ Discuss how water conservation Best Management Practices have been implemented, how they were institutionalized, and quantify repairs and replacements with estimated water savings, if possible.

5 - Green Operations Roadmap Checklist

Policy References: Executive Order B-18-12

Executive Summary:

☐ Summary of status and actions underway to meet sustainability objectives related to green operations

☐ Include summary of changes from previous roadmap.

(This executive summary can be a paragraph in a single, comprehensive executive summary including all roadmap chapters if combined into one document.)

Past Performance:

☐ Report GHG Emissions since 2010 in Table 5.1 and update Graph 5.1 to reflect department emissions trend

☐ Describe any successes or challenges encountered by your department as it seeks to achieve GHG Emission reductions, and how various strategies contribute

☐ Explain which actions your department has taken that had the largest impact on GHGe

☐ Identify newly constructed buildings since July 1, 2012 and LEED level achievement in Table 5.2 and list number of buildings eligible as well as have achieved LEED for Existing Buildings and Operations in Table 5.3.

☐ Report state agency buy recycled campaign 2016 performance in Table 5.5 and describe your department's efforts to increase green commodities

☐ Report the lowest smart location score leases in Table 5.9 and describe the department's measures to improve location efficiency scores

Future Commitment:

☐ Discuss how your department implements efficiency measures to meet Energy Star targets and to achieve LEED EBOM for buildings >50,000 sw. ft. Describe steps to achieve these and goal dates.

- ☐ **D**iscuss the steps taken to ensure new construction incorporates the IEQ provisions of CalGreen, and ensures IEQ is considered and incorporated into products, cleaning, and HVAC operation

- ☐ Identify pest control contracts in Table 5.4 and discuss the steps taken to incorporate IPM into all contracts and practices

- ☐ Describe department efforts to reduce waste and recycle

- ☐ Describe department efforts to reduce environmental impacts through purchases of goods and services

- ☐ Identify commodities categories with the greatest potential to green in Table 5.6 and describe your department's efforts to increase green commodities

- ☐ List buyers who have completed EPP Training in Table 5.7 and discuss available training and certifications buyers may have beyond the basic training courses

- ☐ List new leases and their smart location scores in Table 5.8 and describe the department's measures to improve location efficiency scores

- ☐ Describe how you will achieve greener operations and how many GHGe reductions your department will need to achieve its goal

Appendix D – Acronyms

Customize to include organizations and acronyms within your specific department

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 E - 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:

- Provisioning services are the products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources, and medicines

- 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

- Habitat services provide living places for all species and maintain the viability of gene-pools

- 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% of California's energy use is related to water use with nearly 10% 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 F – 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	
Brent Houser	Deputy Director, Administrative Services Division
Nicole Hicks	Chief Operating Officer
Robert Horsley	Chief of Business Management Branch
Eric Ballinger	DSH Sustainability Coordinator
DSH Hospitals	All Hospital Administrators

Understanding Climate Risk at Planned Facilities	
Brent Houser	Deputy Director, Administrative Services Division
Nicole Hicks	Chief Operating Officer
Shannon Martin-Guzman	Statewide Facilities Manager, FPCM
Debi Nishimoto	Senior Architect, FPCM
DSH Hospitals	All Hospital Administrators

Integrating Climate Change into Department Planning and Funding Programs	
FPCM	FPCM (Sacramento) and All Plant operations and Project Management Representatives
DSH Hospitals	All Plant Operations and Project Management personnel

Measuring and Tracking Progress	
FPCM	FPCM and all Plant Operations

Zero Emission Vehicles

Incorporating ZEVs Into the Department Fleet	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)
DSH-Patton	Raymond Saenz (Automotive Pool Manager I)

Telematics	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)
DSH-Patton	Raymond Saenz (Automotive Pool Manager I)

Public Safety Exemption	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)
DSH-Patton	Raymond Saenz (Automotive Pool Manager I)

Outside Funding Sources for ZEV Infrastructure	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)
DSH-Patton	Raymond Saenz (Automotive Pool Manager I)

Hydrogen Fueling Infrastructure	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)

Comprehensive Facility Site and Infrastructure Assessments	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)
DSH-Patton	Raymond Saenz (Automotive Pool Manager I)

EVSE Construction Plan	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)
DSH-Patton	Raymond Saenz (Automotive Pool Manager I)

EVSE Operation	
DSH- Sacramento	Victor Gutierrez (SSM I)
DSH-Atascadero	Deborah Pippinger (Utility Shops Supervisor)
DSH-Coalinga	John Wilson (Automotive Pool Manager I)
DSH-Metropolitan	Manuel Salas (Automotive Pool Manager II)
DSH-Napa	Karrie Hubbenette (Automotive Pool Manager II)
DSH-Patton	Raymond Saenz (Automotive Pool Manager I)

Energy

Zero Net Energy (ZNE)	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM Unit)
DSH-Patton	Edward Sousa (CPO III)
DSH-Sacramento	Patty Sturdivant (Associate Construction Analyst)

New Construction Exceeds Title 24 by 15%	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM Unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Reduce Grid-Based Energy Purchased by 20% by 2018	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM Unit)
DSH-Patton	Edward Sousa (CPO III)
DSH-Sacramento	Patty Sturdivant (Associate Construction Analyst)

Demand Response	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM Unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Renewable Energy	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM Unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Monitoring Based Commissioning (MBCx)	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM Unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Financing	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM Unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Water Efficiency and Conservation

Indoor Water Efficiency Projects in Progress First initiative	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Boilers and Cooling Systems Projects in Progress	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Landscaping Hardware Water Efficiency Projects in Progress	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Living Landscaping Water Efficiency Projects In Progress	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Buildings with Urban Water Shortage Contingency Plans In Progress	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Green Operations

Greenhouse Gas Emissions	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Building Design and Construction	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Debi Nishimoto (Senior Architect)

LEED for Existing Buildings Operations and Maintenance	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Indoor Environmental Quality	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Integrated Pest Management	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Environmentally Preferable Purchasing	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Paul Bernal, SSMII Acquisitions

Waste and Recycling	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Shannon Martin-Guzman, Staff Services Manager II

Location Efficiency	
DSH-Atascadero	Eric Glau (CPO III)
DSH-Coalinga	Greg Clark (CPO III (A))
DSH-Metropolitan	Leroy Richards (CPO I)
DSH-Napa	Kristen Brown (Facility Manager) / Stacy Heirs (PM unit)
DSH-Patton	Edward Sousa (CPO III)
DSH- Sacramento	Patty Sturdivant (Associate Construction Analyst)

Appendix G – Sustainability Requirements & Goals

Governor Edmund G. Brown Jr. 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 H – 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% with ZEVs, and by 2020 to ensure at least 25 % 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% 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% below 1990 levels by 2030 and reaffirms California's intent to reduce GHG emissions to 80% 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 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% reduction in GHG by 2030 and 80% reduction by 2015.
- **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% reduction or displacement by Jan. 1, 2012 and a 20% reduction or displacement by Jan. 1, 2020.

- **AB 75** – Implement an integrated waste management program and achieve 50% 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% reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020, a 75% reduction by 2025, and 20% 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% of state-owned parking spaces by 2022. It also advances the ZEV procurement target to 50% 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% improvement in the Smart Location Score of new leases compared to the average score of leased facilities in 2016.

Table G-1: Background References and Applicable Roadmap Chapters

	Climate Adaptation	ZEV	Energy	Water	Green Operation
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 I - List of Tables & Graphs