Sustainability Roadmap 2018-2019

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

California Department of Corrections and Rehabilitation

Edmund G. Brown Jr., Governor

Department of Corrections and Rehabilitation Sustainability Roadmap 2018-2019

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STATE OF CALIFORNIA
DEPARTMENT OF CORRECTIONS AND REHABILITATION
Sustainability Roadmap 2018-2019

The "**responsible party**" is the individual or entity that controls, manages, or directs the entity and the disposition of the entity's funds and assets.

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EXECUTIVE SUMMARY

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The Governor, the California State Legislature, and various regulatory agencies have established requirements in executive orders, statutes, regulations, and/or policies, which together direct California State Agencies to operate their respective programs in environmentally sustainable ways. Sustainability efforts as established in California include the following general initiatives:

- Greenhouse Gas Emissions (GHGe) Reductions
- Climate Change Adaptation
- Building Energy Efficiency and Conservation
- Indoor Environmental Quality (IEQ)
- Water Efficiency and Conservation
- Waste Reduction and Recycling
- 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

The California Department of Corrections and Rehabilitation (CDCR) is the largest State agency in total facility size, number of personnel, and percentage of the State's general fund among all agencies under the purview of the Executive Branch. CDCR operates all State adult prisons and juvenile facilities, oversees a variety of community correctional facilities, and supervises all adult and juvenile offenders, including adults released to parole supervision. The CDCR vision is to end the causes and tragic effects of crime, violence, and victimization in our communities. The CDCR mission is to improve public safety through law enforcement that provides for the safe and secure incarceration of the State's most serious and violent felons, and to provide parole supervision and develop and implement rehabilitative strategies to successfully reintegrate these offenders back into their communities.

CDCR employs over 56,000 persons and maintains infrastructure for 34 State-owned adult institutions, 3 juvenile facilities, 6 facilities in "warm shutdown" (minimal operations/no inmates), and a training academy housing cadets. Its facilities include over 49 million square feet of State-owned building space on over 24,000 acres of land statewide. These statistics have established CDCR as the largest California State agency under the Executive Branch as measured by both its number of employees and building infrastructure. Additionally, CDCR leases approximately 1.8 million square feet for its administration needs and contracts for an additional 489,000 square feet for a private correctional facility.

CDCR's building portfolio on average is nearly 50 years old, with its two oldest facilities being more than 100 years old. A large majority of CDCR's facilities need substantial repairs or upgrades to maintain their usability and system efficiencies, particularly in the areas of energy, gas, and water consumption. A host of energy efficiency and other energy-related projects have been completed over the years to reduce the overall consumption of electricity and natural gas, with a number of additional projects planned in the next two years to help improve this performance. At the same time, CDCR has been the leader among all State agencies in reducing grid-based energy purchasing and expects to achieve a goal of 100 megawatts (MW) of solar/wind installations by 2020. Similar reductions have been made in water efficiency and conservation with a dramatic reduction of water consumption by 42 percent compared to the 2003 baseline. Other sustainability efforts such as waste reduction and recycling, green construction, and greening of CDCR's fleets clearly show CDCR's leadership role and Department-wide commitment to operating in a sustainable manner. This consolidated report outlines the efforts achieved through December 2017 and those that are planned in the 2018-2019 time period. Additional information on CDCR Sustainability efforts can be found at http://www.green.ca.gov/Buildings/department/CDCR.

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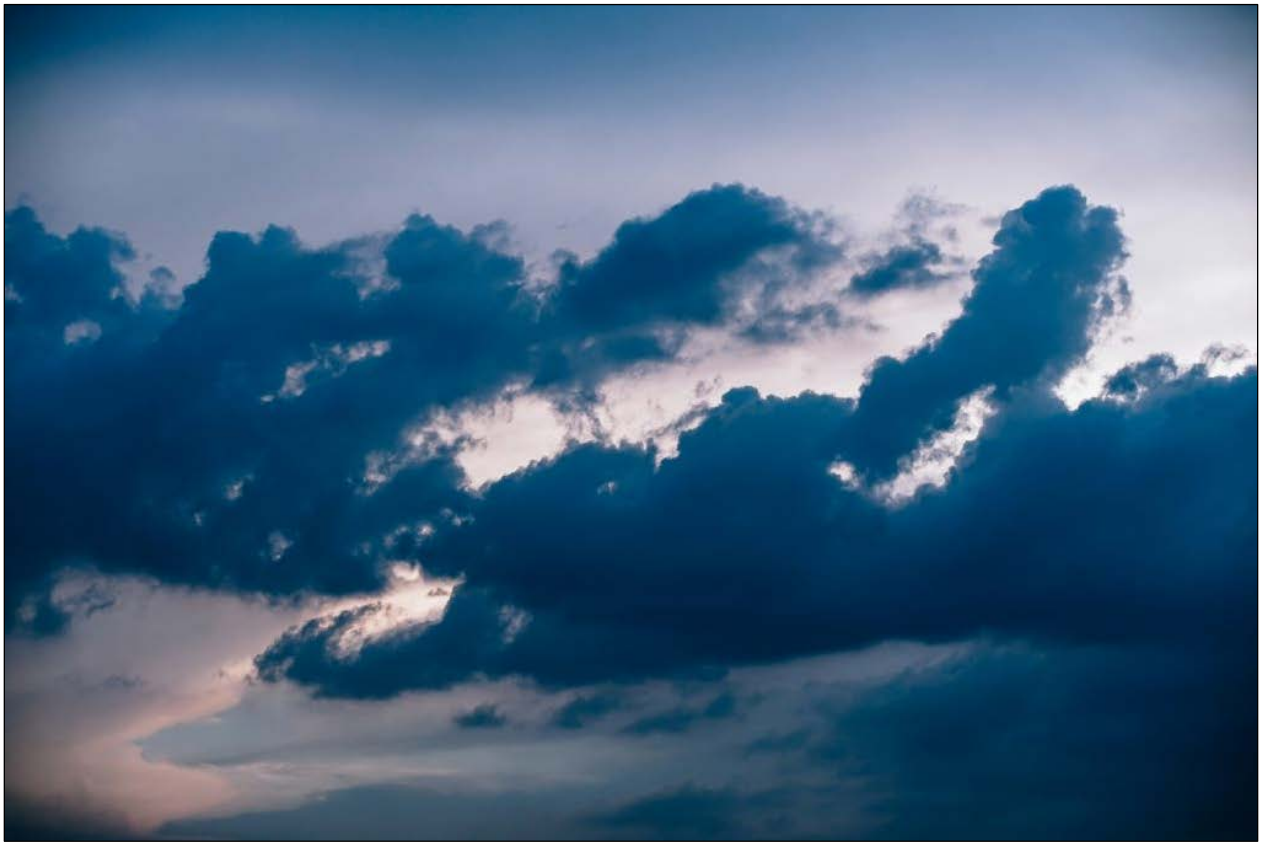
CHAPTER ONE

CLIMATE CHANGE & ADAPTATION



CHAPTER 1: CLIMATE CHANGE & ADAPTATION - OVERVIEW

The State of California has determined that climate change is a serious challenge facing California and has enacted executive orders and legislation aimed at addressing the challenge. A significant number of CDCR facilities are located in climate zones that experience extreme heat or cold in summer and winter months and an equally significant number are located in remote locations that may suffer from monsoonal rains, wildfires, depletion of local water supplies, or similar climate-related concerns. In recognition of CDCR's vast footprint, the Department became an innovator in sustainability to alleviate both the adverse effects of a changing climate on the operations of CDCR but also to establish a leadership position in environmental stewardship. One of its earliest efforts was to install solar arrays at one of its prisons in 2006 to reduce carbon emissions, a prototype installation to test and later install at many more sites. By 2008, CDCR created a unit within the Division of Facility Planning, Construction and Management (FPCM) dedicated to its growing renewable energy and sustainability program. This unit, together with other key stakeholders has worked to implement substantial changes to CDCR operations and has and will continue to identify the potential effects of climate change and pursue efforts to prevent or mitigate them.

FIRST CALIFORNIA STATE AGENCY
To measure carbon emissions in partnership with the Climate Registry

The Department has already incorporated climate action planning into its required *Annual Master Plan* and *Five Year Infrastructure Plans* for the last several years. In fact, beginning in 2007, CDCR undertook an ambitious effort as the first California State agency to measure its carbon emissions and report on these emissions in partnership with The Climate Registry. The Climate Registry was established in 2007 by states within the US and the Canadian provinces. It is currently governed by a Board of Directors comprised of senior officials from 41 US states, the District of Columbia, 13 Canadian provinces and territories, 6 Mexican states, and 4 native sovereign nations. The Climate Registry is a nonprofit GHGe registry for North America that provides organizations with the tools to help them calculate, verify, report, and manage their GHGe in a publicly transparent and credible way. The information gathered from this analysis was used to guide the Department in various resource efficiency and emission reduction strategies since that time.

CDCR also began the preparation of an Environmental Impact Report (EIR) for a Climate Action Plan (CAP) in 2016 that, when completed, will provide guidance in project-level impacts related to climate change for CDCR's facility portfolio and identify potential climate adaptation strategies that could be implemented to address these increased risks and improve the resilience of CDCR facilities and operations in the future. The CAP will be developed utilizing reference documents and measurement tools, including but not limited to the following: online Cal-Adapt tool, reference guides such as California Natural Resources Agency *Safeguarding California Plan* and associated Implementation Action Plans, California Environmental Protection Agency *Preparing California for Extreme Heat Guidelines and Recommendations,* and

the California Coastal Commission Sea Level Rise Policy Guidance. It is CDCR's expectation that this CAP will eventually provide a blueprint by which CDCR can manage its climate risks and provide greater specificity and actionable strategies than are currently laid out in this Chapter of CDCR's Sustainability Plan. Additionally, when combined with CDCR's other ambitious efforts in sustainability; CDCR anticipates its CAP will help the Department continue to address the challenges and opportunities in improving its operations in an environmentally sustainable manner.

I. CLIMATE CHANGE & ADAPTATION GOALS

The Governor has issued numerous executive orders directing sustainable State operations. The Order relevant to climate adaptation is:

Executive Order B-30-15

Executive Order (EO) B-30-15 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 GHGe reduction target of 40 percent below 1990 levels by 2030, and reaffirmed California's intent to reduce GHGe by 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous State agencies to develop plans and programs to reduce emissions. It also directs State agencies to take climate change into account in their planning and investment decisions and employ life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives. State agencies are directed to prioritize investments that build climate preparedness and reduce GHGe, prioritize natural infrastructure, and protect the State's most vulnerable populations.

Legislative Direction

Several pieces of legislation were signed in 2015-2016 that codified several elements of the EO. These include the following:

- Assembly Bill 1482 (Gordon, 2015): Requires the California Natural Resources Agency (CNRA) to 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 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).
- Senate Bill 2800 (Quirk, 2016)[1]: Requires State agencies to take the current and future impacts of climate change into planning, designing, building, operating, maintaining,

1 SB 2800 (quirk) passed in 2016 requires, among other things, that state agencies take into account the current and future impacts of climate change when planning, designing, building, operating, maintaining and investing in state infrastructure

and investing in State infrastructure. The 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).

State Resources and Guidance Documents

California has invested significant resources in understanding the risks of climate change to the State and 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.
- **Building 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. Each assessment has included development of projections of climate impacts on a scale that is relevant to State planning (i.e., downscaled climate projections). This data is available through Cal-Adapt, an online data visualization and access tool.

II. CLIMATE CHANGE ADAPTATION

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

- Infrastructure and Capital Outlay Projects
- Economic Analysis
- Development of Strategic and Functional Plans
- Permitting
- Purchasing and Procurement
- Guidance Development
- Regulatory Activity
- Outreach and Education

This chapter of the Sustainability Roadmap will focus on the first three of these activities, and follows the guidance created by the Technical Advisory Group developed under EO B-30-15 to assist State Agencies to complete this task.

Climate Change Risks to Facilities

For all infrastructure, it is important to assess the risk that a changing climate poses to an asset or project (e.g., sea level rise or increasing daily temperatures). It is also important to recognize

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

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

1. What is the lifetime of the facility, planned project or plan?
2. Could it be affected by changing average climate conditions or increases in extreme events over its lifetime?
3. What is the consequence of that disruption?
4. Will that disruption affect vulnerable populations, critical natural systems, critical infrastructure, or other assets?
5. Will that disruption cause irreversible effects or pose an unacceptable risk to public health and safety?

The effects of climate change can be described in terms of primary exposure to various physical changes in the climate and environment caused by global climate change such as temperature, precipitation, and sea level rise, as well as stresses experienced by facilities as a result of these exposures (e.g., reduced water supply, impacts on structures from erosion and sea level rise, increased frequency and duration of heat waves). These vary considerably from region to region within California.

The application by CDCR of this screening process will depend upon the type of project planned. First, it is worth noting, new and renovation projects planned for CDCR follow the requirements of CALGREEN and, where appropriate, executive order initiatives for Leadership in Energy and Environmental Design[2] (LEED®) and Zero Net Energy (ZNE) construction. The Department also developed uniform standards and guidance documents for its project architects and engineers to ensure these initiatives were met. Its own Design and Construction Policy Guidelines outlines, among other things, requirements to consider and mitigate GHGe, improve energy and water efficiency, improve indoor air quality, implement on-site renewable generation, utilize environmentally preferable construction materials, and develop on-site electric vehicle charging stations. As of December 2017, CDCR has completed 60+ LEED-certified facilities and is in the design phase of its first project specifically designed to achieve ZNE. Projects designed to be LEED-certified and ZNE, by their very nature, will have features that will reduce both the project's carbon footprint and also be more reflective of existing climate conditions that may restrict the design and/or include features that are more adaptive to the climate.

In the case of planning for a Capital Outlay Project, the need for these projects is identified in the Department's Five-Year Plan that is updated each year and submitted to the Department of Finance for funding consideration. Individual projects are submitted as Capital Outlay Budget

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[2] USGBC® and LEED® are trademarks owned by the U.S. Green Building Council and are used with permission

Change Proposals (COBCPs) for legislative consideration and approval. The planning process for each submittal and the COBCP document itself will incorporate a specific section that addresses the above questions. Most often, these projects will not include a newly constructed prison but rather smaller new or renovated structures on an existing prison site. However, when a new prison is required due to operational needs, CDCR first evaluates the ability to build upon its existing footprint to minimize the impact of new construction on the environment. This has been the case for the last ten years of construction by the Department. Additionally, all project impacts, including emissions, waste, and natural habitat impacts, are already studied as required by the California Environmental Quality Act (CEQA). In that endeavor, CDCR has preserved over 800 acres of wildlife breeding/foraging habitats and funded the restoration or creation of nearly 2,500 acres of natural habitat and farmland, resulting in over 3,300 acres to be held in perpetuity by natural resource agencies, land conservancies, or other reputable environmental stewardship organizations.

Other CDCR infrastructure projects are funded through an annual support appropriation to address critical repairs or in some cases, through utility rebates, grants or loans. CDCR maintains more discretion over these types of projects, but they still contain all or most of the above environmental components and will similarly ensure the climate screening questions outlined above are incorporated into its review process.

Beyond infrastructure repairs and capital improvements, CDCR's operations also include a number of other operational areas that have been impacted or could be impacted by the effects of climate change. CDCR's leased portfolio is located in communities throughout California and is managed by the Department of General Services (DGS). CDCR has encouraged DGS to identify new lease opportunities that meet the same sustainability goals as CDCR promotes for its State-owned portfolio and presumes that DGS will now include these climate screening criteria in new site searches on CDCR's behalf. Additionally, CDCR manages an extensive fleet of approximately 3,600 owned vehicles and 1,800 leased vehicles. The Department has worked with DGS to replace a portion of its fleet with Zero Emission Vehicles (ZEV), has already installed electric vehicle charging stations at a few locations with more planned in the near future depending upon grant or funding availability, and is replacing its conventional diesel with renewable diesel. CDCR is also actively recycling and purchasing recycled materials and other environmentally preferable products for use in its facilities. The Department also includes in its construction and rehabilitative programs a curriculum aimed at educating its offenders about sustainability initiatives, including climate change impacts. These efforts will be described in other chapters of this Roadmap.

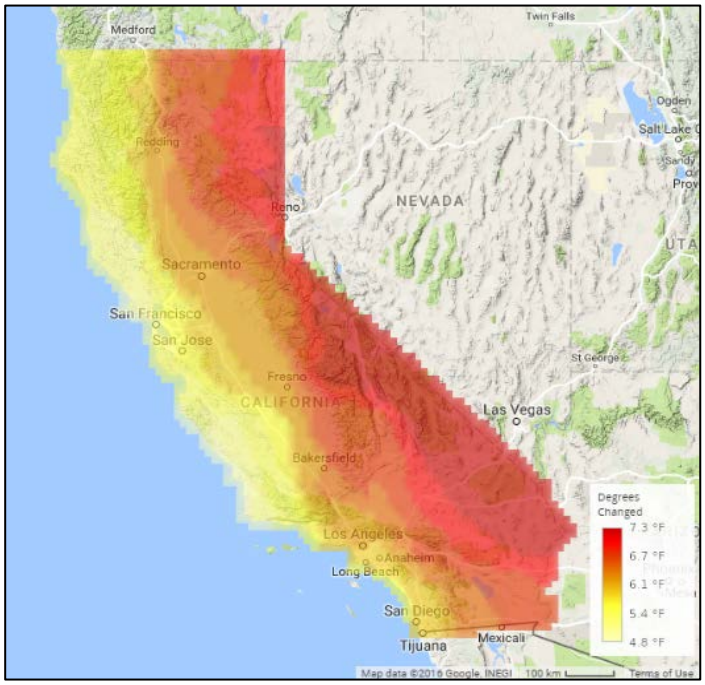
105 ENERGY EFFICIENCY PROJECTS
Have yielded a combined GHGe reduction of 68,888 metric tons per year

Understanding Climate Risk to Existing Facilities

Risk from Increasing 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.

Figure 1- Cal-Adapt 2016 Temperature Forecast



According to the Intergovernmental Panel on Climate Change (IPCC), global average temperature is expected to increase by 0.3 to 4.8˚C (0.5 to 8.6˚F) by the end of the 21st century, depending on future GHGe scenarios (IPCC 2014). In California, average temperatures are also likely to increase significantly with a projected increase of approximately 1.5˚C (2.7˚F), above 2000 averages, by 2050. And depending on emission levels, increase 2.3 to 4.8˚C (4.1 to 8.6˚F), above 2000 averages, by 2100 under a higher emissions scenario (CEC 2012:2-3). The anticipated increase in average temperatures may also be characterized by extreme heat events such as more frequent and longer-lasting heat waves. Higher increases in temperature will be more prominent further inland and closer to desert regions. The map **(Figure 1)** shows the forecasted increase in annual average temperatures in California between a baseline time period (1961-1990) and the end of the century (2070-2099) (Cal-Adapt 2016). The Region Map **(Figure 2)** illustrates the location of CDCR's facilities throughout the state. This map clearly depicts the far-reaching range of locations and, as such, the different climate zones these facilities are located in.

Table 1- Top 5 Facilities Most Affected by Changing Temperature (Degrees Fahrenheit)

Facility Name*	Annual Mean Maximum Temperature (1961–1990)	Annual Mean Maximum Temperature (2031–2060)	Annual Mean Maximum Temperature (2070-2099)	Annual Mean Minimum Temperature (1961–1990)	Annual Mean Minimum Temperature (2031–2060)	Annual Mean Minimum Temperature (2070-2099)
CAL	88.09	88.50	96.91	56.71	62.17	66.67
ISP	87.19	92.04	96.30	58.74	64.27	68.89
CEN	87.64	93.76	96.19	56.84	62.00	66.32
CVSP	86.77	85.35	95.89	49.66	63.75	68.38
CRC	78.94	74.03	87.50	50.54	55.26	59.29

* Sorted data by Estimated Max Temp 2070 – 2099

Figure 2- CDCR Facilities and Climate Impact Regions

ID	FACILITY	CLIMATE IMPACT REGION
1	California Correctional Center, Susanville	North
2	High Desert State Prison, Susanville	North
3	Pelican Bay State Prison, Crescent City	North Coast
4	San Quentin State Prison San Quentin	Bay Area
5	California State Prison, Solano	Bay Area
6	California Medical Facility	Bay Area
7	California Men's Colony, San Luis Obispo	Central Coast
8	Correctional Training Facility	Central Coast
9	Salinas Valley State Prison, Soledad	Central Coast
10	Central California Women's Facility, Chowchilla	Central Valley
11	Valley State Prison for Women, Chowchilla	Central Valley
12	Deuel Vocational Institution	Central Valley
13	California State Prison, Sacramento	Central Valley
14	Folsom State Prison	Central Valley
15	California Correctional Institution, Tehachapi	Central Valley
16	Wasco State Prison-Reception Center, Wasco	Central Valley
17	Kern Valley State Prison	Central Valley
18	North Kern State Prison, Delano	Central Valley
19	Avenal State Prison	Central Valley
20	California Substance Abuse Treatment Facility/State Prison, Corcoran	Central Valley
21	California State Prison, Corcoran	Central Valley
22	Pleasant Valley State Prison, Coalinga	Central Valley
23	California Health Care Facility	Central Valley
24	Sierra Conservation Center, Jamestown	North Sierra
25	Mule Creek State Prison	North Sierra
26	Richard J. Donovan Correctional Facility, San Diego	South Coast
27	California State Prison, Los Angeles County	South Coast
28	California State Prison, Centinela	Desert
29	Calipatria State Prison	Desert
30	Ironwood State Prison, Blythe	Desert
31	Chuckawalla Valley State Prison, Blythe	Desert
32	California Rehabilitation Center, Norco	Desert
33	California Institution for Women Corona	Desert
34	California Institution for Men, Chino	Desert

Source: CDCR 2017 adapted by Ascent Environmental

CDCR Facilities and Climate Impact Regions

The above **Table 1** reflects those prisons that are projected to experience the highest estimated annual maximum temperatures in the year 2070 – 2099. In addition to changing average temperatures, climate change will increase the number of extreme heat events across the State. **Table 2** reflects those prisons with the highest forecasted extreme heat events as measured by the Extreme Heat Threshold. It is not surprising to see that four out of five facilities are represented on both **Table 1** and **Table 2**.

Table 2- Five Facilities that Will Experience the Largest Increase in Extreme Heat Events

Facility Name*	Extreme Heat Threshold (EHT)	Average number of days above EHT (1961-1990)	Average number of days above EHT (2031-2060)	Increase in number of days above EHT by mid-century	Average number of days above EHT (2070-2099)	Increase in Average number of days above EHT by end of century
CVSP	114.1	4.2	17	12.8	29	24.8
ISP	114.1	4.2	17	12.8	29	24.8
CAL	112.9	4.3	23	18.7	39	34.7
CEN	112.5	4.2	19	14.8	32	27.8
WSP	106.2	4.3	22	17.7	29	24.7

*Sorted data by Extreme Heat Threshold

The nature of CDCR's operations dictates the need for very sturdy shell construction (i.e., concrete, concrete block, metal framing, and structural steel) that has a typically longer lifecycle than other types of construction (i.e., wood framing, etc.). CDCR structures tend to withstand the harsh effects of solar rays, wind and rainstorms, and even fire events because of these materials. However, many of the critical support systems contained within and around these structures remain susceptible to climate conditions. Approximately half of the CDCR adult correctional facilities are in areas of the State that have moderate to high summer temperatures. This includes several correctional facilities in the eastern and southeastern deserts, the lower San Joaquin Valley, Antelope Valley, and Inland Empire. Accordingly, CDCR has had long experience in the adaption of the operation of prisons in areas with periods of high daily temperatures. CDCR has traditionally used evaporative cooling for the majority of inmate housing and program areas, which can provide little relief in extreme heat events; only a small portion of each facility typically has refrigerated cooling. However, all facilities regardless of their cooling systems are required to have a heat plan protocol to help reduce the harm to staff and the offender population from extreme conditions.

When cooling systems have outlived their useful life and require replacement and/or upgrading, the Department is increasingly converting to centralized chiller systems that provide more efficient and effective cooling. As an example, a project to replace all of the evaporative cooling with a centralized chiller is expected to proceed to construction in 2018 and will serve the cooling needs of both Ironwood State Prison (ISP) and Chuckawalla Valley State Prison (CVSP), both of which are listed in **Table 1** and **Table 2** on the previous page. This is also one of the Department's first ZNE designed projects. CDCR is also introducing improved cooling systems in its Health Care space and a myriad of housing units serving the CDCR offender population with medical and/or mental health treatment needs. The Department is

also addressing the need to improve the livability of prisons in desert and southern Central Valley locations by adding insulation to its roofing systems as they are replaced to help reduce interior daytime temperatures. CDCR is already working on plans to replace a significant portion of its roofs in need of repair within the next five years.

While increased heat will add challenges to the operations of 30+ year old buildings in deserts and other similar terrain, it will also accelerate deterioration of building systems – especially mechanical systems - if repairs/renovation projects are delayed or deferred. Unfortunately, due to historic funding shortages, CDCR's backlog of deferred maintenance has continued to increase, delaying the replacement or repair that could bring needed upgrades and efficiencies. CDCR continues to seek supplemental funding to replace archaic mechanical systems with more energy efficient systems.

Increased temperatures also add to both water and electricity demands. The effect of increased temperatures on water availability was pronounced during the drought years of 2013-2017 and CDCR took steps to reduce its water use through both operational (conservation) practices and installation of water efficiency measures, exceeding the 25 percent statewide conservation goal set by the Administration. In the case of electrical demands, CDCR established a Demand Response Program in concert with investor owned utilities in 2002 that created a framework through which CDCR can reduce its consumption needs to allow other utility customers to stay connected; the periods of time when this program is of greatest need is during the peak summer months. Part of CDCR's ability to reduce its load during these times and even throughout the year can be attributed to its extensive construction of on-site renewable generation. Currently, CDCR has over 34 Megawatts (MW) of solar generation and is in design or construction at several locations, for a planned total of approximately 125 MW of renewable generation by the close of 2020. These solar installations have assisted CDCR in substantially reducing its total carbon footprint.

Figure 3- Cool Roofs at CHCF

Other sustainability measures incorporated into CDCR projects to assist with temperature impacts beyond LEED and ZNE efforts include its Cool Roof program **(Figure 3)** designed to minimize on-site heat buildup, the installation of solar parking canopies and cool (reflective) pavements to help reduce the heat island effect in CDCR parking facilities, and the installation of misting systems at several Health Care facilities to help mitigate temperature issues during outside recreation hours.

Risk from Changes in Precipitation

Table 3- Facilities that will be Most Impacted by Projected Changes in Precipitation (Inches)

Facility Name	Annual Mean Maximum Precipitation (1961–1990)	Annual Mean Precipitation (2031–2060)	Percent Change by mid-century	Annual Mean Precipitation (2070–2099)	Percent change by end of century
PBSP	4.92	0.0000614	-99.9988%	0.0000615	-99.9988%
SQ	2.07	0.000028	-99.9986%	0.0000309	-99.9985%
FSP/SAC	1.66	0.0000211	-99.9987%	0.0000218	-99.9987%

Only a few existing State prisons are located in settings where increased precipitation could affect ongoing operations and/or the physical safety of the prison facilities. Correctional facilities in Los Angeles, Riverside, and San Joaquin Counties are situated close to major drainage systems that conduct storm water to local collection systems. If climate change results in more intense rainfall events in these or other adjacent watersheds, CDCR will need to potentially improve drainage systems in and near each facility to prevent storm water runoff, intrusion, and erosion. In addition, while the above **Table 3** indicates only three prisons that will experience increased precipitation, several more prisons are impacted by already high precipitation levels in their respective climate zone. The impacts from 2017's historical precipitation was widespread among CDCR facilities, with several facilities not listed above inundated with severe rains and accompanying winds that caused roofs to fail and water intrusion in parking and drive areas, making navigation to and around the prison difficult. Since a substantial portion of CDCR's infrastructure, particularly its roofing systems, needs replacement, high precipitation levels will continue to exacerbate operations until repairs or replacements can be made. Even if improvements within CDCR facilities are made, the lack of companion improvements in the surrounding community can adversely affect operations. Large transportation routes inundated with water have the potential to shut off access for extended periods of time, posing safety hazards to staff and the public trying to access the institutions or worse, transporting ill persons to needed hospitals. Other outside systems that provide CDCR with the continuity of operations can be severely impacted. Two circumstances the Department had to deal with in the aftermath of the storms of 2017: the potential breach of flood levees surrounding and protecting two of its prisons and the potential spillover of reservoirs on CDCR property that became inundated with rainwater. It will be essential that CDCR work with its local partners to ensure that they are aware of and investing as necessary in climate preparation strategies to mitigate excess precipitation.

Changes in precipitation related to a warming climate are, more often than not, going to lead to reduced precipitation as was experienced in the State's recent multi-year historic drought. As a result of reduced rainwater influx, nearly every region within California experienced some level of reduced groundwater and potable water supply availability. Even prior to the drought, proactive steps were taken by CDCR in 2007 to reduce its water consumption in recognition that some of its facilities were located in regions with limited water supplies. However, in response to these water shortages and prolonged drought conditions, CDCR immediately implemented additional water rationing and conservation at all of its facilities in accordance

with Executive directives. CDCR developed a statewide Drought Action Plan and required each institution to develop a site-specific plan as well. Each institution selected a Water Conservation Manager (WCM) to lead Drought Task Force Teams. Each WCM worked closely with their water suppliers and with the Department of Water Resources to ensure coordination, especially at the institutions located in critical groundwater basins. The WCMs also worked with CDCR's FPCM to ensure water shortage contingency plans were in place. Despite the recent drought having ended, the Department continues to emphasize water conservation and pursuit of water conservation retrofits to reduce its reliance on both potable and non-potable supplies.

CDCR requires all construction sites to have a Storm Water Pollution Prevention Plan for implementation and compliance with the National Pollution Discharge Elimination System General Permit. Each facility also has a Sewer System Management Plan in place to help manage and mitigate storm water runoff. During the design and construction of the California Health Care Facility (CHCF), CDCR incorporated landscape elements (bioswales) to remove silt and pollution from surface runoff water, which will also facilitate recharge of groundwater to reduce climate impacts on groundwater supply **(Figure 36)**. In another of its facilities, CDCR installed a permeable paved parking lot that also allowed surface water to percolate through the asphalt and into the water table below to recharge the table and avoid water runoff. There are still opportunities under consideration for rain catchment systems in facilities with high precipitation levels to capture and redistribute excess rain. The Climate Action Plan (CAP) under development will be addressing these same issues pertaining to flood, storm water runoff and landslides, including risks, adverse effects and other relevant issues with more specificity.

Risks from Sea Level Rise

Increasing global temperatures are contributing to rising sea levels. Rising sea levels will result in an inundation of water to coastal areas and increased flooding due to storm surges. The California Ocean Protection Council (OPC) has issued guidance for State Agencies on what range of sea level rise to consider. The Guidance document provides the following estimates of sea level rise for the California Coast, which are based on a study by the National Academy of Sciences.

An accompanying OPC resolution recommends that departments base analyses on estimates of sea level rise in the upper two-thirds of the range.

Global climate change is already contributing to sea level rise, which is projected to continue at increasing rates as warming continues. Along California's coastline, the average sea level rose approximately seven inches during the 20th century (CEC 2012). Assuming sea level rise along the California coast continues to track global trends, projected sea levels along the State's coastline south of Cape Mendocino are expected to increase from 12 to 61 cm (5 to 24 in.) by 2050, and 42 to 167 cm (17 to 66 in.) by 2100, as compared to 2000 levels **(Table 4)**. North of Cape Mendocino, geologic forces are causing much of the land to uplift, resulting in a slower projected rate of sea level rise than California's coastline to the south. Between 2000 and 2100, sea level north of Cape Mendocino is projected to rise approximately 10 to 143 cm (4 to 56 inches) (California Ocean Protection Council [OPC] 2013).

Table 4- Projected Sea Level Rise along the California Coast

Time Period	North of Cape Mendocino	South of Cape Mendocino
2000 - 2030	-4 to 23 cm (-0.13 to 0.75 ft)	4 to 30 cm (0.13 to 0.98 ft)
2000 - 2050	-3 to 48 cm (-0.1 to 1.57 ft)	12 to 61 cm (0.39 to 2.0 ft)
2000 - 2100	10 to 143 cm (0.3 to 4.69 ft)	42 to 167 cm (1.38 to 5.48 ft)

Accelerating sea level rise, especially at the increasing rates projected for the 21st century, may result in the loss of substantial areas of coastal land area. Erosion and inundation from rising sea levels would threaten structures, roads, and other supporting infrastructure located along the coastline and at nearby low elevations.

According to Cal-Adapt data, there are no CDCR correctional facilities that are at risk from rising sea levels; however, CDCR has identified two of its three correctional facilities situated near coastal zones, Deuel Vocational Institution (DVI) and San Quentin State Prison (SQ), which it believes could be impacted by sea level rise and potential flooding along the coastline and delta. San Quentin is situated on a low bluff on the shoreline of San Francisco Bay and has experienced erosion of its protective seawall over the years. An improvement project fortifying its walls was completed several years ago to fortify this structure. Changes in sea level could result in destruction of some support areas outside of the main prison grounds and the influence of storm waves could require further remediation of the existing perimeter seawall. Sea level rise could also disrupt major transportation routes, such as State Route 580 and U.S. Highway 101, which are main thoroughfares for inmate transport, visitor trips, employee commutes, and vendor deliveries. CDCR's DVI prison in San Joaquin County and Pelican Bay State Prison (PBSP) in Del Norte County are located in coastal zones; however, both prisons are well inland of tidal influence and are situated at base land elevations (20-70 feet) above sea level. While these prisons are not currently considered at risk of sea rise, CDCR remains cognizant of the potential for seawater rise influences and will continue to evaluate the risks associated with these locations.

Natural Infrastructure to Protect Existing Facilities

As described above, climate change may increase the risks of impacting institutional operations and some of the strategies mentioned above serve to guard against these risks. For example, planting additional trees to reduce heat island impacts is an appropriate mitigation consideration for new projects. Reducing the heat island effect within a prison yard is also under way, as the Department has completed several gardens inside prison walls with more planned. These gardens are also meant to be therapeutic and provide vital rehabilitation skills and will serve to help educate our offender population about the value of preserving the natural environment. Other natural infrastructure solutions to combat against the effects of climate change included assisting with the funding of levee improvements to widen and raise an existing earthen levee protecting two of CDCR's prisons in the Central Valley that were at risk of flooding during last year's historic rains.

Understanding the Potential Impacts of Facilities on Communities

CDCR facilities are often located in remote rural locations where their presence is significant in terms of population, footprint, and/or as an economic driver in that location. Climate change

that could lead to a prison closure could potentially cripple the economic stability of some of these areas. Some prisons' infrastructure systems (i.e., water, wastewater) either take the burden off local municipalities to serve CDCR populations or in turn provide water or wastewater supplies and services to the greater community. Ensuring that proper planning for CDCR operations needing or providing these services from or to the community is essential in minimizing disruption to that community. As mentioned earlier, CDCR has created a substantial renewable portfolio that reduces reliance on the electricity grid as one key area in which CDCR can mitigate its operational effects and the effects climate change will have on operations within its local communities.

Vulnerable Populations

It is recognized that certain populations are more susceptible to the effects of changing climate conditions and will have less capacity to recover from changing average conditions and more frequent and severe extreme events. Vulnerable populations can include people living in poverty; people with underlying health conditions; incarcerated populations; linguistically or socially isolated individuals; communities with less access to healthcare or educational resources; or communities that have suffered historic exclusion or neglect.

CDCR's incarcerated population is in many ways reflective of the population at large. A significant number of its offenders have either mental or medical health issues and those often include learning disabilities. They are more likely to have experienced some neglect prior to being housed with CDCR. Some of these individuals may be prescribed medications that do not react well with extreme heat conditions. Because these individuals are within the care and custody of CDCR, the unique needs and circumstances of this population are addressed as part of the standard offering of services, including provision of food, housing and education, or as part of their case management plan for those with mental and medical health needs. Once released and/or paroled, these same individuals may once again be subject to risks other vulnerable population's experience. However, CDCR is trying to combat this cycle of vulnerability by emphasizing rehabilitation and employment-building skills during incarceration. These efforts are intended to reduce the chances of an offender reoffending and returning to prison, but also are intended to provide the means to live in a self-sustaining manner after they have served their sentence.

CDCR staff and inmates have also recognized that the community at large, and particularly within proximity to some of our prisons, may struggle with issues of poverty, incarcerated parents, mental health issues and the like, and have volunteered thousands of hours and raised substantial sums of money to assist these vulnerable populations in dealing with a myriad of issues affecting their quality of life.

Disadvantaged Communities

California is required to invest resources in Disadvantaged Communities (DACs). DACs are identified using CalEnviroScreen, a tool that ranks census tracts based on a combination of social, economic, and environmental factors. While it does not capture all aspects of climate vulnerability, it is one tool that is available, and does include several relevant characteristics. In many cases, DACs are more likely to suffer damage under changing climate conditions,

including extreme events. It is recognized that the Department's facilities located in these communities can contribute or alleviate the vulnerability of these communities.

Table 5- Facilities Located in Disadvantaged Communities

Facility Name	CalEnviroScreen Score	Is it located in a disadvantaged community? Yes/No
CHCF	96-100%	Yes
KVSP	96-100%	Yes
NKSP	96-100%	Yes
NCYCC	96-100%	Yes
CCWF	91-95%	Yes
VSP	91-95%	Yes
ASP	76-80%	Yes

As evidenced in **Table 5**, several CDCR facilities are located within a DAC as identified by the CalEnviroScreen. In total, approximately 19 percent of the Department's total institutional portfolio is located in a DAC. As mentioned above and earlier, many of CDCR's facilities are located in remote and/or rural areas, which by and large, suffer from a lack of investment by large corporations more traditionally located in urban settings, thus having a corresponding impact on property values. CDCR is often the largest employer within the region. To ensure local residents were afforded the opportunity to obtain employment with CDCR, its last three major construction projects included contract language that required the construction firm to prioritize local hiring to build the projects. Additionally, CDCR's Division of Administrative Services held both job recruitment and procurement fairs to provide additional opportunities for local residents to find employment or provide services. These on-site hiring fairs have continued at facilities throughout the State. CDCR also has Mutual Aid agreements with local first responder organizations to assist as needed in public service emergencies. Additionally, the Department provides community work crews comprised of inmates that will assist local partners with needed cleanup and infrastructure repairs.

Figure 4- Solar Parking Canopies at RJD

There may still be other avenues for CDCR to pursue in working with these communities, particularly in light of climate change. These opportunities will continue to be evaluated in future projects and planning efforts.

Urban Heat Islands

Urban heat islands are areas with localized spikes in temperature, which impact human health, increase pollution, and increase energy demand. Urban heat islands occur during the hot

summer months in areas with higher percentages of impervious surface and less vegetation. This is likely in areas with large parking lots, dense development, and lower tree density and shading. Urban heat islands can be reduced through tree planting and greening measures, cool roofs (e.g., lighter roofing materials that reflect light), cooler pavements, and other measures.

Table 6- Top Five Facilities Located in Urban Heat Islands (Sorted by highest UHII)

Facility Name	Located in an urban heat island (yes/no)
CRC	Yes
CIM	Yes
CIW	Yes
CMF	Yes
SOL	Yes

The nature of CDCR facilities is such that large portions of the property are covered in paved areas and structures. A typical prison can include up to 1,000 acres and housing upwards of 4,000-6,000 inmates, not including a staffing figure between several hundred to more than 1,000 employees at a given site.

As mentioned earlier, CDCR has already undertaken a number of measures to ensure that the heat island effect is reduced, through such design features as solar-equipped parking canopies **(Figure 4)**, cool pavements and cool roofs, and additional vegetation. Reductions to heat islands have also included installing more energy efficient systems that consume less energy and installing renewable generation that relies solely on solar power and eliminates carbon emissions. More of these efforts will be implemented in the near future, and with the Department's Zero Net Energy policy, all new projects are to be planned as ZNE.

An analysis of statewide effects of climate changes pertaining to extreme heat and local heat islands including risks, adverse effects, and issues that are relevant to the Department's existing facilities as well as potential climate adaption strategies shall be included in the CAP.

Understanding Climate Risk to Planned Facilities

CDCR is not contemplating a significant expansion of its footprint in the near future. For any new projects proposed in the Governor's Budget, the Department's Design and Construction Policy Guidelines establishes minimum siting requirements to avoid or mitigate adverse effects of extreme climate conditions (i.e., floods, heat, wind, snow, and drought). Factors to be considered include:

- Avoid sites in coastal/deltaic settings where an increase in sea level, coastal erosion or other coastal hazards could result in deterioration of the building and support areas of the new facility. Avoidance of areas that could be affected by increases in sea level is preferred over sites that would require levees and other similar hydraulic barriers. (Reference: State of California Sea Level Rise Guidance).

- Avoid sites prone to extreme heat and/or the potential for the heat island effect. Implement strategies to reduce the heat island effect due to climate change; cool roof systems, cool pavements (reflective or permeable), parking canopies, and increased trees and vegetation when feasible. (Reference: Preparing California for Extreme Heat Guidance and Recommendations).
- Avoid sites within a mapped 100-year floodplain and/or sites in the pathway of watersheds that might be subject to increased periods or magnitude of seasonal storm events including monsoonal/hurricane events. Also, avoid placement of new facilities in close proximity to levee and/or storm water channels that may eventually be determined inadequate due to the increasing frequency and/or magnitude of rainfall events. Where feasible, avoid sites that require construction of stand-alone levee systems and/or storm water channels to prevent site inundation. (Reference: Department of Water Resources Statewide Flood Management Program).
- Avoid sites situated within areas of chaparral plant communities, coniferous forest, and/or mature landscaping that may pose the risk of catastrophic wild fires and/or would be difficult to protect from wild fires. (Reference: California Department of Forestry and Fire Protection's Fire and Resource Assessment Program).
- Avoid sites that, due to unique terrain and/or topographic setting, present solar exposure in excess of that typical of the respective climatic area and/or potentially expose new structures to excessive wind levels, dry lightning, snow, or other extreme weather conditions. (Reference: California Office of Emergency Services State Hazard Mitigation Plan).

As new facilities are planned, this information will be evaluated along with other information CDCR uses in its decision-making process and any impacts will be evaluated and addressed as appropriate. The CAP currently under development will serve as an overall framework for this effort.

Natural Infrastructure Solutions for Planned Projects

EO B-30-15 directs agencies to prioritize natural and green infrastructure solutions. Natural infrastructure is the "preservation or restoration of ecological systems or the utilization of engineered systems that use ecological processes to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but need not be limited to, flood plain and wetlands restoration or preservation, storm water management, 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)).

The majority of past sites used for construction of new and/or expanded correctional facilities did not contain significant natural resources such as wetlands, old growth forests, critical habitat for endangered species, etc. However, when such resources are present, CDCR typically provides appropriate direct or indirect mitigation. For example, because of the unavoidable loss of grassland habitat at an expansion site on the Richard J. Donovan Correctional Facility in south San Diego County, the Department secured 35 acres of burrowing owl habitat conservation credits.

CDCR has implemented a number of natural infrastructure solutions to mitigate the environmental impacts of its projects, some of which were described above. Earlier projects have funded and planned wetlands restoration or preservation projects such as the installation of bioswales at the California Health Care Facility in Stockton or, more recently, wetlands avoidance and restoration at a construction site completed in 2016.

CDCR also provides for the long-term protection of sensitive and/or declining wildlife species that may be lost due to the operation of the lethal electrified fencing used within the secure perimeter of many State prisons. In conformance with the Department's Habitat Conservation Plan, habitat that will serve to maintain and/or enhance the target sensitive wildlife species is acquired in non-profit conservation banks approved by State and Federal wildlife regulators.

In instances where CDCR projects are unable to fully avoid effects to natural resources, off-site mitigation is typically implemented through purchase of conservation credits within various habitat preserves. In addition to mitigation required for the direct effects of new or expanded facilities, the Department also secures habitat to compensate for the loss of wildlife as a result of its perimeter security systems. Through the later program, CDCR has preserved over 800 acres of wildlife breeding/foraging habitats and sensitive ecosystems through direct land acquisition, funding conservation easements, purchasing mitigation credits at state/federal agency approved mitigation banks, and has funded the restoration/creation of nearly 2,500 acres of various natural habitats and farmland; this approximately 3,300 acres is held in perpetuity by natural resource agencies, land conservancies or other reputable environmental stewardship organizations.

Integrating Climate Change into Department Planning and Funding Programs

Full Life Cycle Cost Accounting

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

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

Unlike more traditional real property that may have an identified timeline of between 30-50 years, often coincident with either its financing scheme or the life of its major systems, CDCR does not consider its existing correctional facilities to have a specific end of life term. While the majority of existing State correctional facilities have been built since 1985, the Department currently has two correctional facilities over 125 years old yet remain serviceable for inmate housing and programs. CDCR is able to continue operation of the entire span of historic and contemporary facilities through periodic upgrades/replacements of infrastructure, housing units, and program support areas. The design standards of all renovation projects, and for

replacement/expansion projects, are the requirements of the State Building Code and, if feasible, additional commitments that exceed these standards such as those of the Leadership in Energy and Environmental Design program.

For all third-party energy conservation/generation projects, such as new on-site photovoltaic installations, CDCR performs life cycle costing to account for all costs related to construction, operation, maintenance, and disposal at the end of the useful life of a structure. Economic metrics used for energy efficiency projects include; Simple Payback, Return on Investment, Life Cycle Cost Analysis, Savings to Investment Ratio, Net Present Value, and Internal Rate of Return. CDCR leverages a formal partnership with California's Investor Owned Utilities to identify and implement energy efficiency projects that utilize rebates and zero percent loans to realize cost savings.

Table 7- Integration of Climate Change into Department Planning

Plan	Have you integrated climate?	If no, when will it be integrated?	If yes, how has it been integrated?
Climate Action Plan in development process	Yes - In progress	N/A	See below

Table 8- 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?
Climate Action Plan in development process	As necessary	TBD	Yes

Funding of Projects to Reduce Climate Risks

State agencies are required to pursue all available financing and project delivery mechanisms to achieve executive order goals and mandates including, but not limited to: State revolving loan funds, utility On-Bill Financing (OBF), Power Purchase Agreements (PPAs), Green Seal (GS) $Mart, Energy Service Contractors, or other available programs.

CDCR has been successful in fulfilling many of the State mandates of energy efficiency and sustainability by seeking out various funding opportunities as they become available. CDCR is proactive in promoting additional funding opportunities by participating in policy discussions on topics such as OBF and On-Bill Repayment (OBR).

CDCR has utilized and will continue to explore multiple funding opportunities for projects that aid in climate adaptation including GS $Mart loans, OBF, Municipal utility company loan and incentive programs, American Recovery and Reinvestment Act (ARRA) loans, Energy Conservation Assistance Act (ECAA) loans, Department of Water Resources loans and grants, and Solar or Wind PPAs.

Measuring and Tracking Progress

For the last several years, CDCR has incorporated climate action planning into its *Five Year Infrastructure Plan*. Carbon emissions data has been tracked since 2007. The Department also regularly reports its electricity consumption data into an Energy Star Portfolio, where its progress can be tracked on a public-facing website. Additionally, CDCR executed an agreement in 2016 with an environmental consulting firm to prepare a Climate Action Plan (CAP) to analyze statewide climate change effects as they relate to CDCR facilities and operations. CDCR's consultant is required to identify potential climate adaption strategies that could be implemented to address increased risks and improve the resilience of CDCR facilities and operations. The consultant will use existing guidance and tools including, but not limited to, the following: online Cal-Adapt tool, reference guides such as California Natural Resources Agency *Safeguarding California Plan* and associated Implementation Action Plans, California Environmental Protection Agency *Preparing California for Extreme Heat Guidelines and Recommendations,* and the California Coastal Commission Sea Level Rise Policy Guidance. The CAP will also provide a GHGe inventory, emissions reduction plan, and a comprehensive analysis of the environmental effects of the potential adoption of measures that would further reduce GHGe to contribute to the statewide goal of reducing the long-term potential for climate change. Upon completion, the CAP will serve as a guideline along with required activities under the California Environmental Quality ACT (CEQA) for CDCR when making new facility investment decisions that may have environmental impacts.

CDCR recognizes the importance of understanding the current and future impacts of climate change in the State when planning, designing, building, operating, maintaining, and investing in correctional facilities and infrastructure. Proactive planning for future climate change is necessary for resiliency and protection of the Department's assets, as well as providing a better use of resources, improving self-sufficiency, and maximizing the efficient use of fuel, water, and other resources while carrying out the CDCR mission and vision.

CHAPTER TWO

GREEN OPERATIONS

CHAPTER 2: GREEN OPERATIONS - OVERVIEW

CDCR has been a major force within State government in accomplishing the objectives set forth in EO B-18-12 for State buildings, including energy efficiency projects and GHGe reduction efforts such as using clean on-site power generation, solar photovoltaic, and wind power generation. Through third-party Solar Power Purchase Agreements (SPPA), CDCR has completed 16 on-site renewable solar generation projects at 12 institutions totaling 33.6 megawatts (MW AC). CDCR recently awarded nine solar projects and is in the process of awarding 10 more, which will provide an additional 54 MW of solar energy. CDCR also awarded three wind turbine projects that will provide 4 MW of renewable wind energy. CDCR's statewide renewable energy portfolio is positioned to exceed 125 MW by the end of 2020.

34 MW/yr GENERATED BY RENEWABLE POWER

125 MW/yr solar and wind power projected by 2020

CDCR has managed the design and construction of 60 new buildings that have achieved U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Certification of a Silver level or higher. In addition, CDCR occupies eight LEED-certified leased buildings. CDCR has identified an additional eight projects that will be designed to meet or exceed the LEED Silver certification standards. There are also over 150 Health Care Facility Improvement Program (HCFIP) sub-projects currently being constructed that are designed to meet CALGREEN standards. Finally, CDCR has identified several potential Zero Net Energy (ZNE) building projects that are currently in design as new construction or are in the certification process.

CDCR's emphasis on "building green" has also carried through into its operations. The Department has established a number of green practices throughout its facilities. Examples include:

- Improved waste diversion and enhanced waste reduction and recycling,
- Maintenance methods aimed at improving indoor air quality such as enhanced filtration,
- Establishing less toxic methods to control pests though integrated pest management practices, and
- Utilizing environmentally preferred purchasing methods for typical purchases such as office supplies and cleaning products to ensure goods and services meet stringent standards.

Planned installations of electric vehicle charging stations will enable staff to use emission-free vehicles in their daily commutes and when combined with on-site renewable generation, will help to improve air quality.

These programs and partnerships, along with CDCR efforts overall have led to an 11 percent decrease in grid-based energy purchases and a 24 percent decrease in the overall Energy Usage Index (EUI) rate since 2003, despite a 17 percent increase in total institutional square footage.

From August 2014 through December 2017, CDCR has diverted approximately 23,000 tons or organic waste from landfills. CDCR has exceeded the 10 percent entity-wide GHGe reduction goal set by Governor Brown in 2015 and is on track to meet the goal of a 20 percent reduction by 2020.

Through the continued efforts of CDCR's programs, projects, and objectives, the Department is on track to meet or exceed the overall GHGe, energy, and renewables goals and objectives set forth by the Administration and its own ambitious sustainability agenda, including being a leader in advancing and meeting the goals and objectives of EOs B-18-12 and B-16-12.

I. GREEN OPERATIONS GOALS

The Governor and legislature have directed state agencies to prioritize sustainability efforts within their respective departmental operations. The orders and legislation relevant to green operations described in this roadmap, as well as policy guidelines aimed at implementing these directives, are:

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 lowering GHGe, 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.

Executive Order B-16-12

EO B-16-12 directs State agencies to integrate zero emission vehicles (ZEVs) into their vehicle fleet and to develop the infrastructure to support an increased public and private sector use of ZEVs. Specifically, it directs State agencies replacing fleet vehicles to exchange at least 10 percent with ZEVs, and by 2020 to have fleets comprised of at least 25 percent ZEVs.

Executive Order B-30-15

EO B-30-15 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 GHGe reduction target of 40 percent below 1990 levels by 2030 and reaffirms California's intent to reduce GHGe to 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions.

Assembly Bill 4

Assembly Bill (AB) 4 was 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 non-recycled products, and submit plans for meeting the annual goals for purchasing recycled content products.

SGC Resolution on Location Efficiency

Location efficiency refers to the GHGe 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 Strategic Growth Council to achieve a 10 percent improvement of the Smart Location Score of new leases compared to the average score of leased facilities in 2016.

State Administrative Manual & Management Memos

The following Management Memos (MM) currently impose requirements for green operations on the department under the Governor's executive authority:

- MM 15-04: Energy Use Reduction for New, Existing, and Leased Buildings - This MM provides direction to all State agencies to reduce and to report energy use in: new building design and construction, major alterations and additions (new buildings and renovations), existing state-owned buildings (existing buildings), and new and renegotiated state building leases (building leases).
- MM 15-06: Building and Grounds Maintenance and Operation - This MM provides State building and facility managers with practices and procedures to achieve operational efficiencies and resource conservation measures for: Integrated Pest Management (IPM), Drought Moratorium, Landscaping Practices, and Maintenance of Building Exteriors, Roofs, Hardscape, and Exterior Painting.
- MM 14-05: Indoor Environmental Quality: New, Renovated, and Existing Buildings - This MM announces policy and provides direction to State agencies that build, lease, and operate State buildings, on reducing indoor pollutant levels and ensuring healthful indoor environments for occupants in new, renovated, leased, and existing State buildings, as directed in Governor's EO B-18-12 and the *Green Building Action Plan*.
- MM 14-07: Standard Operating Procedures for Energy Management in State Buildings - This MM amends the Standard Operating Efficiency Procedures regarding efficient energy management in State buildings during normal operations, as specified in EO B-18-12 and the *Green Building Action Plan*.

II. GREEN OPERATIONS REPORT

Greenhouse Gas Emissions

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

GREENHOUSE GAS EMMISSIONS
Reduced by 27% since 2010

CDCR is on track to meet the 20 percent goal by 2020 based upon the 2010 baseline. However, CDCR had previously set a 2007 baseline and based upon that has already exceeded the 20 percent goal by

almost 10 percent despite a 17 percent increase in total institutional square footage. CDCR will continue to strive for further reductions and plans to achieve them through the efforts described below.

Energy Efficiency

CDCR has engaged in a collaborative effort through the California Investor-Owned Utilities (IOU)/CDCR Energy Efficiency Partnership Program to improve energy efficiency since 2008. As of December 2017, CDCR has completed 105 energy efficiency projects that have yielded a combined GHGe reduction of 68,888 metric tons per year and an annual cost savings of $8,450,670.

CDCR will continue to utilize energy efficiency projects to reduce GHGe. Looking beyond 2017, CDCR has identified 70 future energy efficiency projects. These projects are expected to provide annual cost savings of $1,601,611 and additional GHGe reductions of over 9,500 metric tons per year.

On-Site Renewable Energy

Through third-party Solar Power Purchase Agreements (SPPA), CDCR has completed 16 on-site renewable solar generation projects at 12 institutions totaling 33.6 megawatts (MW AC).

CDCR recently awarded 20 solar projects, which will provide an additional 53 MW of solar energy. CDCR also awarded three wind turbine projects that will provide 5.6 MW of renewable wind energy, the only California state agency with plans to install wind energy.

Figure 5- Solar Array at PVSP

CDCR will continue to utilize renewable energy projects to reduce GHGe and is currently considering 7 additional institutions for solar installations for an additional 33 MW of renewable energy generation. CDCR's statewide renewable energy portfolio is positioned to exceed 125 MW by the end of 2020 as shown in **Table 9**.

Table 9- CDCR Renewable Energy Portfolio

Institution	Completed Solar (MW)	Awarded/In Construction Solar (MW)	Future Planned Solar (MW)	Wind Generation (MW)
ASP	0	0	8.00	0
CAL	0	5.00	0	0
CCI	2.33	4.00	0	0
CCWF	2.50	2.00	0	0
CEN	0	5.00	0	0
CHCF/NCYCC	0	0	5.00	0

Institution	Completed Solar (MW)	Awarded/In Construction Solar (MW)	Future Planned Solar (MW)	Wind Generation (MW)
CIW	0	1.00	0	0
CMC	0	3.50	0	0
CMF	0	0	3.00	0
COR	5.00	0	0	0
CTC	0	0	1.00	0
CTF	1.00	2.00	0	1.85
CVSP	4.94	3.00	0	0
DVI	0	0	8.00	0
FSP/SAC	0	1.30	0	0
ISP	5.00	2.00	0	0
KVSP	0	3.00	0	0
LAC	2.00	2.40	0	1.85
MCSP	0	2.00	0	0
NKSP	5.00	0	0	0
PVSP	1.22	2.00	0	0
RJD	0	3.00	5.00	0
SCC	0	0	3.00	0
SOL	1.13	3.00	0	0
SVSP	2.00	3.50	0	1.85
VCYF	0	1.50	0	0
VSP	0	2.15	0	0
WSP	1.50	2.00	0	0
Totals	*33.6*	*53.4*	*33.0*	*5.6*
Grand Total	**125.6**			

Purchased Renewable Energy

To date, CDCR has relied on the use of renewable energy produced on-site due to its substantial landholdings but is considering purchasing renewable energy from other providers (Sacramento Municipal Utility District and Marin Clean Energy) for institutions where land constraints are present to increase its total energy delivered through renewable resources. However, CDCR is participating in three Community Choice Aggregate programs; San Quentin is enrolled in Marin Clean Energy's Light Green program receiving 50 percent renewable energy, SVSP and CTF are enrolled in Monterey Bay (MB) Community Power's MB Choice program receiving 100 percent renewable energy and LAC is enrolled in Lancaster Choice Energy receiving 38 percent renewable energy.

Fuel Efficient Vehicles and Zero Emission Vehicles

CDCR's light-duty fleet has increased the number of fuel-efficient vehicles over the last several years. As of December 2017, CDCR has 653 traditional hybrid vehicles, 47 plug-in hybrids vehicles and eight battery electric vehicles (BEV) as shown on the website State of California

Green Fleet. The Department is availing itself of utility companies' grant programs and other funding sources to install the requisite charging infrastructure and has already installed charging stations at several prisons with more planned based on available funding.

In addition to the State-owned fleet, CDCR conducted a statewide survey of employees at its institutions to determine the interest level in installing charging stations for the employee and public parking lot. The results showed favorable support for this infrastructure and CDCR is currently evaluating these options.

Looking forward, fuel-efficient vehicle purchases will continue to increase per the Department's Fleet Acquisition Plan, and opportunities to support other non-fleet vehicles with charging needs will continue to be explored and implemented as the need increases and/or resources permit.

Biofuels

CDCR operates a number of vehicles, equipment, and buildings systems that rely on diesel fuel. The Department has recently increased its renewable diesel and other biofuel purchases where feasible and will continue to explore additional opportunities to increase the Department's usage. For example, in 2016, CDCR purchased over 32,000 gallons of renewable diesel. As of December 2017, CDCR has purchased over 175,000 gallons of renewable diesel, an increase of almost 550 percent.

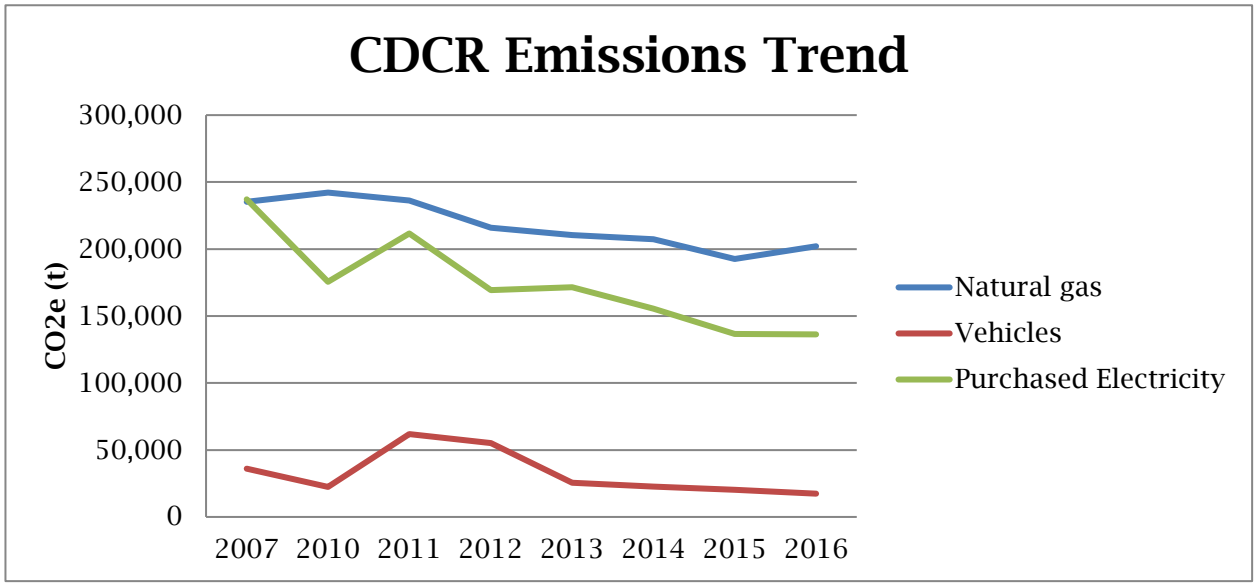
All of the above efforts in combination and others discussed in this report have led to substantial reductions in the Department's carbon footprint. **Table 10** and below show the GHGe reductions that CDCR has realized since 2007.

Table 10- GHG Emissions Since 2007

	Natural Gas	Vehicles	Purchased Electricity	Total
2007 Baseline	235,247	36,122	237,127	508,46
2010 Baseline	242,165	22,414	175,570	440,150
2011	236,345	61,861	211,632	509,839
2012	215,931	55,144	169,331	440,405
2013	210,379	25,424	171,434	407,237
2014	207,314	22,582	155,553	385,449
2015	192,601	20,222	136,501	349,324
2016	202,194	17,381	136,289	356,584
Percent Change since 2007 Baseline	-14.05%	-51.89%	-42.54%	-29.87%

Percent Change since 2010 Baseline	-16.51%	-22.46%	-22.38%	-18.99%

Graph 1- GHG Emissions Since 2007



Building Design and Construction

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

Since July 1, 2012, CDCR has 14 LEED BD+C certified new construction projects (including the MCSP Level II Dorm Complex project completed in 2016) involving 59 buildings plus an additional four leased buildings (totaling 11 with Gold and 51, Silver ratings). Additionally, CDCR has renovated one existing building and leases two others, which earned LEED ID+C Silver certifications.

All new buildings and renovations built since July 1, 2012 and the associated LEED level achieved, along with post-construction commissioning (Cx) completed or planned, are listed in **Table 11** below.

Table 11- New Construction Since July 1, 2012

Project Name	LEED Level Achieved	Commissioning Performed (Y/N)
CIW - 45-Bed Mental Health Crisis Facility	1 Building, LEED BD+C Silver, 2013	Y
SAC - Enhanced Outpatient Program	1 Building, LEED ID+C Silver, 2013	Y
CMF - 64-Bed Mental Health Crisis Facility	1 Building, LEED BD+C Silver, 2013	Y

Project Name	LEED Level Achieved	Commissioning Performed (Y/N)
CMF - Enhanced Outpatient Program	1 Building, LEED BD+C Silver, 2013	Y
COR - ASU Enhanced Outpatient Program	1 Building, LEED BD+C Gold, 2014	Y
LAC - ASU Enhanced Outpatient Program	1 Building, LEED BD+C Gold, 2014	Y
CMC - 50-Bed Mental Health Crisis Facility	1 Building, LEED BD+C Gold, 2014	Y
SAC - Psychiatric Services Unit	1 Building, LEED BD+C Gold, 2014	Y
SVSP - Enhanced Outpatient Program	1 Building, LEED BD+C Gold, 2014	Y
CHCF - Materials Service Center	1 Building, LEED BD+C Gold, 2014	Y
CHCF - Central Utility Plant	1 Building, LEED BD+C Gold, 2014	Y
CHCF - Various	31 Buildings, LEED BD+C Silver, 2014	Y
DNCA - Enhanced Outpatient Program	1 Building, LEED BD+C Silver, 2015	Y
DNCA - Material Unit Transfer	1 Building, LEED BD+C Silver, 2015	Y
MCSP - Level II Dorm Complex	12 Buildings, LEED BD+C Silver, 2016; 2 Buildings, LEED BD+C Gold, 2016	Y
RJD - Level II Dorm Facility	In Progress, Goal of LEED BD+C Silver	Cx Planned
ISP - Central Chiller Plant	In Progress, Goal of LEED BD+C Silver	Cx Planned
CCC - HCFIP (Sub-project 4)	In Progress, Goal of LEED BD+C Silver	Cx Planned
CMC - HCFIP (Sub-project 4)	In Progress, Goal of LEED BD+C Silver	Cx Planned
CMC - HCFIP (Sub-project 6)	In Progress, Goal of LEED BD+C Silver	Cx Planned
FSP - HCFIP (Sub-project 3)	In Progress, Goal of LEED BD+C Silver	Cx Planned
SAC - HCFIP (Sub-project 3)	In Progress, Goal of LEED BD+C Silver	Cx Planned
SOL - HCFIP (Sub-project 1)	In Progress, Goal of LEED BD+C Silver	Cx Planned
CIM - 50-Bed Mental Health Crisis Facility	In Progress, Goal of LEED BD+C Silver	Cx Planned
RJD - 50-Bed Mental Health Crisis Facility	In Progress, Goal of LEED BD+C Silver	Cx Planned

State agencies, such as CDCR, are required to implement mandatory measures and relevant and feasible voluntary measures of the California Green Building Standards Code (CALGREEN), Part 11, related to indoor environmental quality (IEQ) that are in effect at the time of new construction or alteration and shall use adhesives, sealants, caulks, paints, coatings, and aerosol paints and coatings that meet the volatile organic chemical (VOC) content limits specified in CALGREEN.

CDCR supports the implementation of EO B-18-12, LEED, CALGREEN Tier 1, and commissioning requirements by ensuring those requirements are clearly laid out for new construction projects. The Department's standard Architect and Engineering Contract of Services includes language mandating the incorporation of Governor's EO B-18-12, including the *Green Building Action Plan*, and requiring compliance with CALGREEN Code. In addition, CDCR's Sustainable Design Guidelines (Design Criteria Guidelines Manual – Volume II – Appendix J) provides additional information outlining the requirements for LEED Silver certification for new and major renovations >10,000 square feet (sf), commissioning for new construction and renovations >5,000 sf with an Energy Usage Index (EUI) of 50 kBTU/sf or larger, and for all new construction and renovations >10,000 sf.

Figure 6- California Health Care Facility

Several projects, currently in construction, have completed a Green Building Compliance Report during the Schematic Design Phase which details how each of the requirements of EO B-18-12, including the *Green Building Action Plan*, are proposed to be implemented. This report has only recently been required by CDCR of its consultants for new construction. It includes LEED requirements and a preliminary scorecard together with commissioning requirements for all buildings >5,000 sf. This report also includes a CALGREEN checklist which describes how projects need to comply with the mandatory requirements and which voluntary Tier 1 requirements are relevant and feasible together with the requirements for documentation to be provided by the contractor to demonstrate compliance at the end of the project.

CDCR provides design consultants with Standard Design Document (SDD) specification sections that are available for use on a project. The SDD specifications already include the requirements for LEED submittals and certification as part of *Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS*. CDCR's standard sustainable design specification has been edited to include the general requirements and procedures for compliance with CALGREEN on certain projects. This specification requires the maintaining of a comprehensive LEED and CALGREEN file electronically with verification documentation for each LEED and CALGREEN measure. In addition, modifications to *Sections 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL* and *01 81 22 INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY* were updated to include CALGREEN requirements. CDCR also has two specification sections that address recycled content, which require the contractor to track and report recycled-content products for procured materials and submit Waste Reduction Reports.

Incorporating Indoor Environmental Quality (IEQ) Provisions of CALGREEN Tier 1

CDCR's sustainable guidelines help designers understand the project requirements in relation to sustainability. CDCR's sustainable guidelines state that all relevant and feasible voluntary measures from Divisions A4.5 and A5.5 of the California Green Buildings Standards Code should be implemented.

Voluntary measures for Tier 1 for IEQ CALGREEN include increased testing of indoor air quality, more stringent formaldehyde requirements, VOC limits and verification for acoustical ceilings and wall panels, use of entryway systems and isolation of pollutant sources, increased air filtration (MERV 11), additional lighting and thermal comfort controls, increased consideration for additional daylight and view requirements, no hydrochlorofluorocarbons (HCFCs), and requirements for hydrofluorocarbons (HFCs). Mandatory Tier 1 measures include additional requirements for resilient flooring and thermal information together with verification of code compliance.

Figure 7- IEQ Monitoring During Construction at PVSP

As discussed previously, some projects currently in construction have completed a Green Building Compliance Report during the Schematic Design Phase. Specific updates made to *Sections 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS* and *01 81 22 INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY* also support the IEQ provisions of CALGREEN Tier 1 to include no additional formaldehyde, VOC limits and verification for acoustical ceilings and wall panels, thermal insulation improvements and verification and building flush-out. These were the CALGREEN Tier 1 measures identified for the program as being relevant and feasible. Tier 1 measures that were identified as not feasible in a correctional environment included entryway systems, daylight, and views requirements. CDCR will continue to explore Tier 1 measures that can be incorporated in select buildings that are not correctional in nature and/or are outside of the secure perimeter in future projects.

LEED for Existing Buildings Operations and Maintenance (LEED O+M)

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

CDCR staff has identified 23 buildings over 50,000 sf that will require LEED O+M certification. However, there are multiple challenges in achieving this goal:

- The United States Department of Energy, which established the Energy Star program, does not have established energy star criteria for correctional facilities. Without this, CDCR cannot achieve any energy star rating and hence a LEED O+M designation. This requires a change at the federal level, which CDCR intends to pursue along with other state correctional agencies.

- USGBC LEED O+M Minimum Energy Performance Prerequisite requires that each building's energy use must be metered for a full 12 months of continuous operation. CDCR institutions commonly have only one utility meter for the entire institution so building sub-meters must first be installed.
- The cost of installing these sub-meters must be planned over multiple fiscal years.
- CDCR also utilizes high-security protocols for information systems that must be coordinated with any data transmissions from the new sub-meters.

However, despite these challenges, CDCR is working closely with an Energy Service Company, institution staff, and CDCR's Enterprise Information Services staff and has begun the process of installing sub-meters at select buildings with others planned in the future.

Table 12- LEED for Existing Buildings and Operations

Number of Buildings over 50,000 sf and eligible for LEED O+M	23
Number of Building over 50,000 sf that have achieved LEED O+M	3 in process
Percentage of buildings over 50,000 sf required to achieve LEED O+M that have achieved it	0

Moving forward, CDCR will continue to install building sub-meters at the remaining 20 LEED O+M eligible buildings based upon funding availability. Additionally, CDCR includes the installation of building sub-meters in the design of all new construction and rehabilitation projects, which will facilitate future LEED O+M certification.

Indoor Environmental Quality (IEQ)

When accomplishing Alterations, Modifications, and Maintenance Repairs, and when relevant and feasible, State agencies shall implement the mandatory and voluntary measures of the California Green Building Standards Code (CALGREEN), Part 11, related to indoor environmental quality. Indoor Environmental Quality must also be maintained by using low-emitting furnishings, cleaning products and cleaning procedures.

New Construction and Renovation

To ensure healthy indoor environments for occupants, CDCR's Sustainable Design Guidelines (Design Criteria Guidelines Manual – Volume II – Appendix J) require relevant and feasible voluntary measures from Divisions A4.5 and A5.5 of CALGREEN, which relate to Environmental Quality. As laid out above, steps have been taken to improve the process for ensuring voluntary measures related to IEQ are implemented in all building projects by including specific requirements which relate to IEQ in the specifications. These requirements include requiring submittals for product data indicating VOC content for adhesives and sealants applied inside the weatherproofing barrier, paints and coatings, and applied on-site. They also include the requirements

for VOC limits for adhesives, sealants, caulks, paints, coatings, flooring systems, thermal insulation, and acoustic panels.

FPCM plans to implement additional steps by December 31, 2018 to institutionalize the use of these standards including:

- Updating the standard specifications used on all new construction and major renovation projects to incorporate CALGREEN submittal/calculation requirements.
- Updating standard specifications used on all new construction and major renovation projects to require a Construction Management Plan be completed together with outside airflow monitoring.
- Requiring a Green Building Compliance Report for all new construction and major renovation detailing compliance with EO B-18-12 and the inclusion of LEED/CALGREEN checklists (as applicable).
- Requiring local air quality at the project site to be reviewed and appropriate level of filtration recommended as per the Green Building Compliance Report.
- Requiring the CALGREEN checklist to be included in each package of drawings. At 100 percent Construction Documents (CDs), this checklist shall include reference to plan sheets/specifications or attached calculations where the compliance can be checked.
- CDCR performing design review at 100 percent CDs to verify the CALGREEN checklist is complete and submitted with plans.
- CDCR performing design review at 100 percent CDs to verify CALGREEN calculations/submittals are provided as per specification requirements.
- Requiring A/E to update the CALGREEN checklist following comments received and re-submits for sign-off.
- Requiring the contractor to update the CALGREEN checklist following comments received and re-submits for sign off.

CDCR also maximizes daylighting in new construction when feasible by providing a direct line of sight to the outdoors via windows, skylights, and clerestory glazing in 90 percent of all regularly occupied areas, as well as using top-lighting, side-lighting, light shelves, reflective room surfaces, various means to eliminate glare, and photo sensor controls where feasible. This can be a challenge in correctional facilities but design teams should ensure these methods are incorporated for all areas where possible.

Figure 8- Clerestory Windows at SAC

Furnishings

Per MM 14-05, office furniture and seating is required to comply with either:

- DGS' Purchasing Standard and Specifications (Technical Environmental Bid Specification 1-09-71-52, Section 4.7) or
- The American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) Standard 189.1-2011 (Section 8.4.2.5).

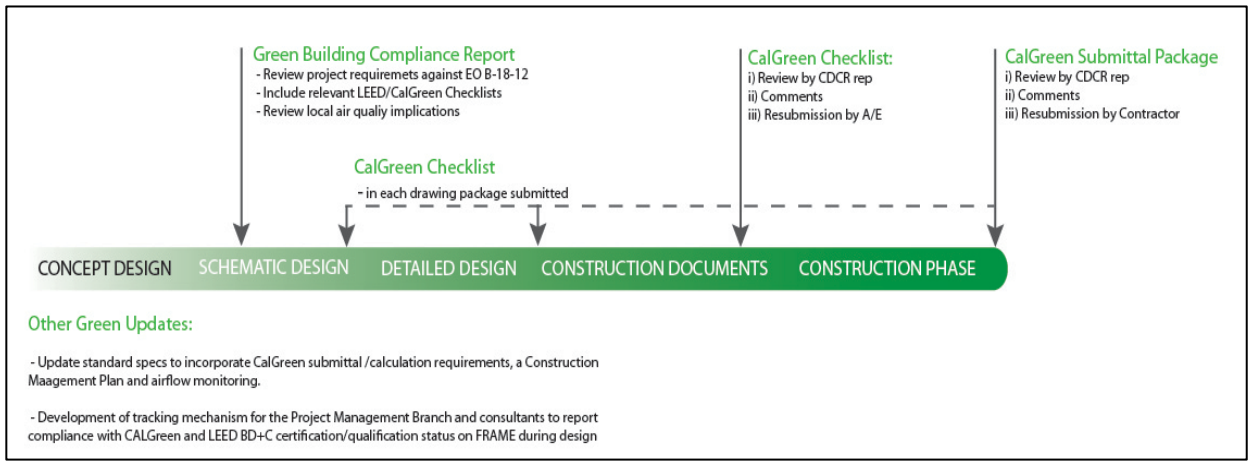
CALPIA manufacturing and associated products are compliant with DGS' Purchasing Standard and Specifications (Technical Environmental Bid Specification 1-09-71-52).

DGS has a modular systems furniture specification (DGS 7110-3045 REV. 6 Engineering & Environmental Specification) which, under Section 5 Environmental specifications, establishes the requirements and specifications for implementation of Environmentally Preferable Purchasing (EPP) as mandated by the California Public Contract Code (PCC), Division 2, Part 2, Chapter 6, Sections 12400-12404, and required by EO B-18-12. For seating, the State has DGS Purchasing Standard 56112100 Seating, which in a similar manner sets out the Environmentally Preferable Purchasing Requirements in line with EO B-18-12.

CDCR has begun development of a tracking program for its Project Management Branch and consultants to report compliance with CALGREEN and LEED BD+C certification/qualification status on their internal/consultant SharePoint website during design. This tracking process will help support the verification of compliance with CALGREEN and LEED BD+C.

The chart **(Figure 9)** below illustrates CDCR's process to be implemented in 2018 to further institutionalize the use of the standards mentioned.

Figure 9- CDCR Process Flow



Cleaning Products

CDCR utilizes 'California Green' cleaning products manufactured by the California Prison Industry Authority (CALPIA). CALPIA products meet the Green Seal™ standard. Per section 2807 of the California Penal Code, CDCR must order items provided by CALPIA unless an exemption has been approved.

Cleaning Procedures

CDCR employs inmates at its facilities to provide general cleaning. CDCR has also been using CALPIA and inmates under its employ at all Health Care facilities statewide through their Healthcare Facilities Maintenance (HFM) program. HFM provides reliable, comprehensive, and innovative cleaning services for California Correctional Health Care Services (CCHCS) and meets all federal and California healthcare environmental standards. The CALPIA team focuses on infection prevention and germ control by using a comprehensive program, which includes training and hands-on supervision. CALPIA uses quality specialized cleaning products, ensuring conformance to environmental services best practices and International Sanitary Supply Association (ISSA) guidelines.

FPCM will consult with CDCR's adult operations and CALPIA managers regarding the cleaning programs and procedures to ensure that the requirements outlined in DGS MM 14-05 are followed.

HVAC Operation

During construction, CDCR requires that HVAC systems provide no less than the Minimum Outdoor Air Requirements and that buildings are purged with outdoor air sufficient for three complete air changes or the minimum ventilation rate allowed in Section 120.1(c)2 of Title 24 for 1 hour before occupancy of completed renovations or new construction. This requirement for outdoor air monitoring will be added to *SECTION 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS* to ensure this requirement is included on all projects per MM 14-05.

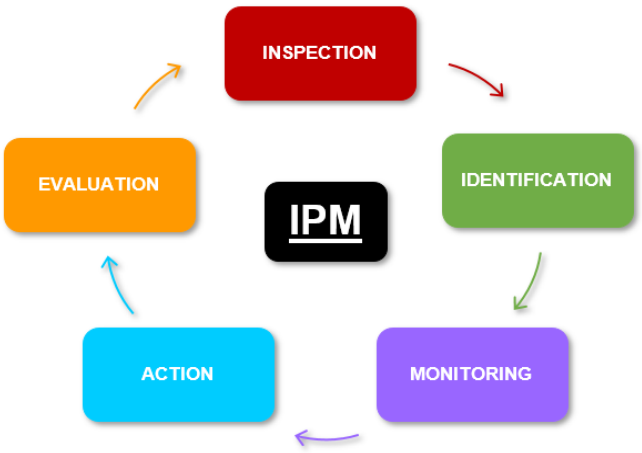
Figure 10- IAQ Monitoring During Construction at SAC

After construction and during normal operations, CDCR Plant Operations staff at each institution performs HVAC system maintenance and repair tasks per the schedules set in CDCR's Standard Automated Preventive Maintenance System (SAPMS), a computer-based system that tracks all institution maintenance and work orders. SAPMS details work activities required based typically on manufacturer's recommendations. These activities include:

- Verification of minimum outdoor airflows using hand-held airflow measuring instruments.
- Confirmation that air filters are clean and replaced based on the manufacturer's specified interval.
- Air filters have a Minimum Efficiency Reporting Value (MERV) rating of no less than 11.
- Verification that all outdoor dampers, actuators and linkages operate properly.
- Checking condition of all accessible heat exchanger surfaces for fouling and microbial growth, with action taken if growth is found.
- Checking the first 20 feet of ductwork downstream of cooling coils for microbial growth, with action taken if growth is found.
- Ensuring that cooling towers are properly maintained and that records of chemical treatment are kept.
- FPCM will review SAPMS required tasks to ensure that they are also consistent with the provisions of EO B-18-12 in 2018 and implement any required changes accordingly.

Integrated Pest Management (IPM)

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



CDCR has long-term pest management strategies in place either through a statewide contract or at the individual institution level. The term IPM has not been specifically used by the Department but the strategies are the same, beginning with monitoring, improved sanitation, and installing physical barriers such as caulk before moving on to the use of chemicals. The existing pest control contracts listed in **Table 13** below expire on December 31, 2017 with the new contract beginning January 1, 2018, which will include 26 institutions. The contracts contain all of the strategies of an IPM and the term IPM will be added to the scope of work for any new contracts.

The remaining eight institutions have their own certified pest control technician on staff and each one has Operating Procedures in place that describe in detail the specific requirements of each institution.

Table 13- Existing Pest Control Contracts

Pest Control Contractor	Institutions	IPM Specified (Y/N)
Tovar Termite and Pest Control	CIM, CIW	N
American Pest Control	VYCF	N
Cartwright Termite and Pest Control	ASP, CAL, CCI, CEN, CHCF, COR, CTF, DVI, VSP, SATF	N

Waste Reduction and Recycling

Organic waste makes up approximately one third of the 30 million tons of waste that are currently sent to landfills within the State of California. In October 2014, Governor Brown signed AB 1826 (Ch. 727, Stats. of 2014), requiring businesses and State facilities generating eight cubic yards of organic waste or more per week to have an organic waste recycling program. AB 1826 established progressive thresholds for the reduction of organic and solid waste reaching landfills, with a statewide goal of 50 percent diversion of organic waste by 2020.

DIVERTED FROM LANDFILLS
23,000 tons of food and organic waste since 2014, enough to fill 3,066 dump trucks

In order to achieve the mandates of AB 1826, CDCR is working with the California Department of Resources Recycling and Recovery to establish a comprehensive program aimed at diverting food and green waste from landfills. CDCR also executed a new master services contract in 2017 to provide food and green

waste recycling services statewide. CDCR has experienced challenges in complying with this mandate mainly at its four desert institutions: CAL, CEN, CVSP, and ISP. CEN and CAL received bids from contractors but due to the excessive costs, both facilities are planning to install vermicomposting. For CVSP and ISP, there were five attempts to have a contractor bid on the statewide contract to provide services, and all attempts failed to deliver any bidders. The next steps will be to find alternative recycling solutions for these institutions. In addition, RJD utilizes vermiculture to compost organic waste instead of diverting to the landfill.

Environmentally Preferable Purchasing

State agencies are required to purchase and use environmentally preferable products (EPP) that have a reduced effect on human health and the environment when compared with competing goods that serve the same purpose, per CA Public Contract Code (PCC) 12200-12217.

Reducing Impacts

The environmental impact of the goods purchased by CDCR can sometimes be larger than the impact of Department operations given its significant size and volume of transactions. CDCR is committed to reducing the environmental impact of the goods and services purchased.

CDCR buyers are encouraged to purchase Green/EPP-compliant goods and goods with post-consumer-recycled content whenever feasible. Additionally, service contracts require contractors to self-certify that they will comply with PCC 12200.

Extensive and continued efforts have been put forth to improve CDCR's State Agency Buy Recycled Campaign (SABRC) compliance and reporting accuracy. The Office of Business Services (OBS) is committed to continued participation in the Department of General Services' (DGS) Performance and Environmental Standards (PES) workgroup to enhance and share knowledge and understanding of EPP purchasing standards and contract language for use in solicitations. Additionally, CDCR OBS has committed to participate in the Sustainable Purchasing Leadership Council (SPLC) Benchmark Cohort Pilot to ensure CDCR buyers are kept up-to-date on the latest in supply chain sustainability. OBS believes the SPLC Benchmark Cohort Pilot will assist buyers in understanding how to efficiently and accurately incorporate sustainability in their procurement decisions.

CDCR is working toward implementation of consolidated orders to create ease of ordering, reduce costs, and decrease deliveries per commodity. OBS encourages EPP purchasing through statewide contracts using SABRC-compliant products. OBS is taking additional steps to create policy that will require inclusion of DGS purchasing standards and specifications for select commodity purchases. OBS is streamlining processes and in many instances removing paper forms. OBS will continue to provide EPP training as needed.

CDCR ensures purchases are EPP-compliant for the following categories:

- Paint (i.e. master painter's institute certified paint and recycled paint)
    - Buyers are encouraged to utilize the Green/EPP-compliant statewide contract for recycled paint whenever feasible.

- Janitorial supplies and cleaners (EcoLogo, Green Seal certified cleaners, DGS_471318A Purchasing Standard compliant)
    - OBS requires that all institutions with sub-delegated purchasing authority participate in the CDCR/CALPIA Centralized Procurement Program (CPP). CALPIA cleaning products (janitorial, laundry, and kitchen) are purchased annually through the CPP process and delivered to locations per an agreed-upon annual delivery schedule. CALPIA products meet the EPP Green Seal standard, and consolidated annual ordering reduces the need for small on-demand deliveries.
- Janitorial supplies, paper products (i.e., SABRC compliant and DGS_141117A Purchasing Standard Compliant)
    - OBS conducts quarterly consolidated solicitations on behalf of participating institutions for toilet paper and paper towels. All of the toilet paper and paper towels purchased through the consolidated ordering process are SABRC compliant.
- Desk Lamps (DGS-391115-A Purchasing Standard compliant)
    - CDCR buyers are encouraged to purchase Green/EPP compliant goods and goods with post-consumer recycled content, whenever feasible (per policy).
- Office equipment (i.e. Electronic Product Environmental Assessment Tool (EPEAT) compliant and EnergyStar rated printers, copiers and DGS_432121A Purchasing Standard compliant for high-end multifunctional devices) and paper products (i.e. Sustainable Forestry Initiative certified, SABRC compliant copy paper, DGS-441200-A Purchasing Standard compliant)
    - CDCR purchases Green/EPP/SABRC compliant equipment and copy paper from the DGS statewide contract.
- Remanufactured toner cartridges (available from CALPIA and statewide contract ID/Number: 1-15-75-61)
    - CDCR purchases SABRC compliant toners from the statewide contract and CALPIA whenever feasible.

Measure and Report Progress

Institutions utilize contracted vendors for diversion of their organic waste. Monthly tonnage is reported to the Energy and Sustainability Section (ESS) by each vendor equal to the sum of that month's weight receipts from each pick up. These amounts are recorded and maintained by ESS to track the total amount of waste diverted from each institution. ESS is working with CDCR's project management consultant to develop dashboard reports on the Facility Records and Management Enterprise (FRAME) site to show CDCR's organic waste diversion efforts.

CDCR's OBS department trains buyers in the benefits of buying EPP products and how to apply best practices and standard specifications to procurements. OBS is also taking steps to create policy that will require the inclusion of DGS purchasing standards and specifications for select commodity purchases. Currently OBS is developing a policy that will increase the use and

oversight of the DGS Purchasing Standard DGS-411200-A when competitively soliciting bids for copy paper. OBS commits to finalizing and implementing this policy in the summer of 2018. CDCR's OBS participates in the PES workgroup and SPLC and provides knowledge transfer to the buyers.

CDCR only tracks SABRC and does not currently have an EPP tracking mechanism in place. OBS will collaborate with the Enterprise Information Systems staff to develop EPP identification and tracking methods within the purchase order in the Systems Applications and Products (SAP) program. EPP data entered into the purchase order can then be accessed in the State Contract and Procurement Registration System (SCPRS).

Extensive and continued efforts have been put forth to improve CDCR's SABRC compliance and reporting accuracy. OBS facilitates and includes SABRC training in annual training efforts. OBS also has an analyst tasked with oversight of SABRC compliance for all CDCR entities with sub-delegated purchasing authority. **Table 14** below details CDCR's performance in the SABRC.

Table 14- State Agency Buy Recycled Campaign (SABRC) - 2016 Performance by CDCR

Product Category	SABRC Reportable Dollars	SABRC Compliant Dollars	% SABRC Compliant
Antifreeze	$6,275.62	$1,736.50	27.67%
Compost and Mulch	$38,412.71	$20,366.39	53.02%
Glass Products	$679,746.42	$290,146.68	42.68%
Lubricating Oils	$198,056.73	$108,762.11	54.91%
Paint	$661,119.16	$222,849.07	33.71%
Paper Products	$7,230,917.86	$5,654,852.96	78.20%
Plastic Products	$7,382,966.87	$4,638,987.77	62.83%
Printing and Writing Paper	$3,225,009.20	$1,977,744.21	61.33%
Metal Products	$30,960,081.27	$18,490,385.85	59.72%
Tire Derived Products	$164,082.30	$45,786.77	27.90%
Tires	$657,969.11	$1,200.23	0.18%
Totals	$51,204,637.25	$31,452,818.54	61.43%

OBS requires all entities with sub-delegated purchasing authority to submit individual SABRC reports annually to CalRecycle. OBS verifies and monitors each entity's SABRC data and overall compliance. This process enables OBS to identify and address non-compliant categories more efficiently. The OBS SABRC analyst provides individual training on an as-needed basis to assist entities with sub-delegated purchasing authority in SABRC compliance.

OBS' ongoing strategy to achieve the 50 percent minimum goal in each category is to:

- Work with the BIS team to enhance reporting capabilities and accuracy in SAP.

- Increase oversight of locations with sub-delegated purchasing authority through a quarterly review process.
- Research commonly purchased non-SABRC compliant commodities and identify comparable SABRC compliant products.
- Inform buyers of the research results and encourage them to purchase the SABRC compliant products.

This strategy, in conjunction with enhancing the use of SABRC compliant specifications and DGS Purchasing Standards, will put CDCR on the path to achieving the 75 percent SABRC goal by 2020.

Sustainability Development and Education

CDCR promotes the understanding and advancement of sustainable procurement both internally and with external suppliers by including language in all service contracts to ensure bidders/contractors are aware of the EPP requirements. The following language is required by DGS in their General Terms and Conditions, Exhibit C, and is also included in all CDCR contracts:

> "RECYCLING CERTIFICATION: The Contractor shall certify in writing under penalty of perjury, the minimum, if not exact, percentage of post-consumer material as defined in the Public Contract Code Section 12200, in products, materials, goods, or supplies offered or sold to the State regardless of whether the product meets the requirements of Public Contract Code Section 12209. With respect to printer or duplication cartridges that comply with the requirements of Section 12156(e), the certification required by this subdivision shall specify that the cartridges so comply with Public Contract Code Section 12205."

As previously noted, OBS currently has one analyst tasked with SABRC compliance and reporting for all entities purchasing under CDCR's non-IT goods purchasing authority. This position is also tasked with PES workgroup and SPLC participation.

CDCR has confirmed that EPP training through the California Procurement and Contract Academy (CALPCA) has not been offered since 2013 and is not currently available for staff to complete. If/when DGS CALPCA offers EPP training, CDCR will support training enrollment for its buyers. CDCR currently has 62 employees assigned as buyers.

In addition to these efforts, CDCR has established sustainability coordinators at each of its institutions and developed a website and other educational materials to promote a greater understanding of CDCR's sustainability efforts to increase awareness amongst its staff of how employees can contribute in these efforts.

Location Efficiency

Location efficiency refers to the effect of a facility's location on travel behavior and the environmental, health and community impacts of that travel behavior, including emissions from vehicles. Locating Department facilities in location-efficient areas reduces air emissions from State employees and users of the facilities, contributes to the revitalization of California's

downtowns and town centers, helps the Department compete for a future workforce that prefers walkable, bikeable and transit-accessible worksites, and aligns Department operations with California's planning priorities.

Location Efficiency is determined by the use of the Smart Location Calculator, which can be found here: Smart Location Calculator. The Calculator provides a Smart Location Index (SLI), which ranges in value from 0-100, where 0 indicates the least location-efficient site in the region, and 100 indicates the most location-efficient site. These scores are relative to the region and should not be compared across regions.

CDCR coordinates its leasing efforts with DGS, as it is the leasing authority for real property for State Agencies. CDCR must take into account many factors when selecting new lease locations and is faced with several constraints. The California Penal Code places limitations on the locations of parole offices, such as maintaining a set number of miles away from schools, parks and victim residences. In addition, parole offices should be in close proximity to the parolees being served, or at least accessible by public transit.

The State of California currently offers partial reimbursements for State employees using commuter buses or regional transit to encourage reducing commuter traffic, particularly in urban areas. CDCR's headquarters operations is located in Sacramento's downtown core, immediately adjacent to the city's transit line which makes this means of commuting attractive to the Department's employees. This location also includes multiple vehicle charging stations and includes on-site showers and bike storage for employees using this transit option. CDCR recently added a free Bike Share program to employees at its headquarters' location to use to travel in and around the city during the weekday.

CDCR's Leasing and Property Management Section works with the assigned DGS leasing manager to analyze each potential location, its amenities, and other improvements. In the future, CDCR will ensure that this process includes consideration of the location efficiency score in selecting leased spaces. For example, if two or more spaces are available in an area being considered, preference will be given to the space with the higher location efficiency score, provided that the space meets all other departmental criteria and goals. CDCR's goal is to increase the average location efficiency score for all new leases to 10 percent higher than its January 1, 2017 baseline. All new executed leases since January 1, 2017 are shown below in **Table 15**.

Table 15- Smart Location Score for New Leases

Facility Name	Smart Location Calculator Score
Stockton Parole Office	83
Red Bluff Parole Office	74
Redding Parole Office	71
Sacramento Parole Office	67
West Covina Office of Correctional Safety	66
San Luis Obispo Parole Office	62
Riverside Parole Office	61
Irvine Parole Office	59
Salinas Parole Office	39
Sacramento Office (FPCM/OPOS/EIS/OBS)	28
Sacramento Accounting Office	28
Average / 2017 Baseline	58

The lowest scoring leases in CDCR's portfolio are shown below in **Table 16**. The two Sacramento locations are just outside the core Sacramento metro area and were lease renewals that were entered into years ago after the CDCR office needs exceeded the available space in its downtown location. CDCR will continue to evaluate its lower scoring lease locations and market availabilities in the Sacramento metro region for consolidation in future negotiations.

Table 16- Lowest Smart Location Score Leases

Facility Name	Smart Location Calculator Score
Sacramento FPCM/OBS/EIS/OPOS Office	28
Sacramento Accounting	28
Salinas Parole Office	39

CHAPTER THREE

ENERGY

CHAPTER 3: ENERGY - OVERVIEW

Since 2008, CDCR has engaged in a collaborative effort through the California Investor-Owned Utilities (IOU)/CDCR Energy Efficiency Partnership Program to improve energy efficiency at its existing facilities. As of December 2017, CDCR has completed 105 energy efficiency projects that have yielded a combined GHGe reduction of 68,888 metric tons per year and an annual cost savings of $8,450,670. Looking beyond 2017, CDCR has identified 70 additional energy efficiency projects. These projects are expected to provide annual cost savings of $1,601,611 and an additional GHGe reduction of over 9,500 metric tons per year.

DECREASED ENERGY USE
At 33 of 39 sites since 2013

CDCR has been the leader within State government accomplishing the objectives set forth in EO B-18-12 for State buildings using clean on-site power generation, such as solar photovoltaic and wind power generation. Through third-party Solar Power Purchase Agreements (SPPA), CDCR has completed 16 on-site renewable solar generation projects at 12 institutions totaling 33.6 megawatts (MW AC). As of the Sustainability Roadmap report date of December 2017, CDCR has awarded 9 solar projects and is in the process of awarding 10 more, which will provide an additional 54 MW of solar energy. CDCR also awarded 3 wind turbine projects that will provide 4 MW of renewable wind energy. CDCR's statewide renewable energy portfolio is positioned to exceed 125 MW by the end of 2020.

To ensure energy efficiency at its newest facilities, CDCR has managed the design and construction of 60 new buildings that have achieved U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Certification of a Silver level or higher. In addition, CDCR occupies eight LEED-certified leased buildings. CDCR has identified an additional eight projects that will be designed to meet or exceed the LEED Silver certification standards. There are also over 150 Health Care Facility Improvement Program (HCFIP) sub-projects currently being constructed that are designed to meet CALGREEN standards. Finally, CDCR has identified several potential Zero Net Energy (ZNE) building projects that are currently in design as new construction or are in the certification process.

These programs, partnerships, and overall CDCR efforts have led to an 11 percent decrease in grid-based energy purchases and a 24 percent decrease in the overall Energy Usage Index (EUI) rate since 2003, despite a 17 percent increase in the total institutional square footage footprint.

Through the continued efforts of CDCR's current and ongoing programs, projects, and objectives, CDCR is on track to meet or exceed the energy and renewables goals and objectives set forth by the Administration and its own ambitious sustainability agenda, including being a leader in advancing and meeting the goals and objectives of EOs B-18-12 and B-16-12.

I. ENERGY GOALS

The Governor has issued numerous executive orders directing sustainable State operations. The orders and related policy guidance relevant to energy are:

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 lowering GHGe, 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. MM 17-04 also provides related requirements and guidance for meeting Zero Net Energy (ZNE).

Executive Order B-30-15

EO B-30-15 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 GHGe reduction target of 40 percent below 1990 levels by 2030 and reaffirms California's intent to reduce GHGe by 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous State Agencies to develop plans and programs to reduce emissions.

State Administrative Manual & Management Memos

The following sections of the *State Administrative Manual (SAM)*, and associated MMs, currently impose sustainability requirements on the Department under the Governor's executive authority:

- *SAM* Chapter 1800: Sustainability – This *SAM* chapter provides the policies and guidelines put in place pursuant to the *Green Building Action Plan* accompanying EO B-18-12. In partnership with other State Agencies, the Department of General Services (DGS) develops policies and guidelines for the operation and maintenance of State buildings to achieve operating efficiency improvements and water and resource conservation, and continually incorporates them into *SAM*.
- MM 15-06: State Buildings and Grounds Maintenance and Operation - This MM provides State building and facility managers with practices and procedure achieve operational efficiencies and resource conservation measures for: Integrated Pest Management (IPM), Drought Moratorium, Landscaping Practices, and Maintenance of Building Exteriors, Roofs, Hardscape, and Exterior Painting.
- MM 15-04: Energy Use Reduction for New, Existing, and Leased Buildings - This MM provides direction to all State Agencies to reduce and to report energy use in: new building design and construction, major alterations and additions (new buildings and renovations), existing state-owned buildings (existing buildings), and new and renegotiated State building leases (building leases).
- MM 15-03: Minimum Fuel Economy Standards Policy - This MM announces a revision to *SAM* section 3620.1, which sets a fuel economy standard for passenger vehicles and light duty trucks [under 8,500 pounds gross vehicle weight rating (GVWR)] that are purchased on behalf of, or by State offices, agencies, and departments. It states that effective July 1, 2015, the combined annual purchases by each State entity of passenger

vehicles and light duty trucks shall meet the new minimum State average fuel economy standard of 38 miles per gallon (MPG) for passenger vehicles and 22.2 MPG for light duty trucks, vans and sport utility vehicles established pursuant to *SAM* Section 3620.1.

- MM 14-05: Indoor Environmental Quality: New, Renovated, And Existing Buildings - This MM announces policy and provides direction to State Agencies that build, lease and operate State buildings, on reducing indoor pollutant levels and ensuring healthful indoor environments for occupants in new, renovated, leased, and existing State buildings, as directed in Governor's EO B-18-12 and the *Green Building Action Plan*.
- MM 14-07: Standard Operating Procedures for Energy Management in State Buildings - This MM amends the Standard Operating Efficiency Procedures regarding efficient energy management in State buildings during normal operations, as specified in EO B-18-12 and the *Green Building Action Plan*.
- MM 14-09: Energy Efficiency in Data Centers and Server Rooms - This MM provides direction to all State Agencies to meet data center and server room energy efficiencies as required in the *Green Building Action Plan* Section 10.7.

II. ENERGY REPORT

This Energy Report demonstrates to the Governor, Legislature, and the public the progress the Department has made toward meeting the State's sustainability goals related to energy. This report identifies accomplishments, ongoing efforts, and outstanding challenges.

Department Infrastructure

- Correctional facilities must provide the confined inmate population with most of the services available in a small city; the infrastructure includes a wide variety of essential buildings and systems including: housing units, kitchen and dining facilities, medical, dental, mental health and substance abuse treatment space, pharmacies, laboratories, classrooms, chapels, libraries, recreation areas, vocational and industry space, firehouse, laundry, warehouse, wastewater treatment and water plant operations, administrative offices, staff training, and inmate and staff records space. All operations must occur in a secure environment, requiring correctional facilities to have various features and systems to provide both internal and perimeter security.
- The correctional facilities include complex and extensive energy, utility, and telecommunications systems, as well as an electronic security infrastructure. In addition, due to their size and often remote location, many operate their own potable water and wastewater treatment systems. Some facilities have cogeneration that produces part of their electrical power. Energy efficiency projects for the Department must take into account the infrastructure needs of each institution before projects can proceed. **Table 17** below details the types of energy purchased by CDCR in 2016.

Table 17- Total Purchased Energy 2016 (excluding Renewables)

Purchased Utility	Quantity	Cost ($)
Electricity	545,900,201 kWh	$ 60,140,136
Natural Gas	38,070,733 Therms	$ 16,862,133
Propane	24,832 Gallons	$ 22,552
Total Cost	---	**$ 77,024,822**

It is important to quantify the energy intensity of each facility as detailed in **Table 18**. This allows CDCR to review its priorities when evaluating opportunities.

Table 18- CDCR Institutions with Largest Energy Consumption (including Renewables)

Building Name	Floor Area (ft^2)	Site Energy (kBTU)	Site EUI ($kBTU/ft^2$-yr)	Source EUI ($kBTU/ft^2$-yr)
Avenal State Prison (ASP)	1,671,840	356,086,996	213	213
California Institution for Men (CIM)	1,748,957	307,011,512	176	176
Richard J. Donovan Correctional Facility (RJD)	1,577,252	291,481,750	185	185
California Medical Facility (CMF)	1,178,055	282,375,349	240	240
California Correctional Center (CCC)	755,800	276,807,216	366	366
California State Prison-Sacramento (SAC)[3]	1,324,762	240,854,003	182	182
Substance Abuse Treatment Facility (SATF)[3]	1,681,956	234,123,610	139	129
California State Prison-Corcoran (COR)[3]	1,652,194	229,980,822	139	129
California Correctional Institution (CCI)	1,540,096	210,147,017	136	123
California Men's Colony (CMC)	1,461,907	207,552,695	142	142
Total for Buildings in This Table	14,592,819	2,636,420,970	---	---
Total for All Department Buildings	49,091,627	5,921,433,477	---	---
% of Total (Buildings in This Table compared to Total of All Department Buildings)	30%	45%	---	---

- Given the data above, CCC has the highest energy intensity consumption. This is due to the age of the facility (built in 1963), and antiquated equipment/systems. Currently, CCC purchases electricity from Plumas Sierra Rural Electric Cooperative (PSREC), which does not offer any financing options for implementing energy efficiency projects. CDCR is planning to complete an energy audit in Fiscal Year 17/18 to identify potential energy

3 Where noted, utilities are shared between two institutions and data listed was generated by prorating the totals by the institutions' 2016 square footage.

efficiency measures (EEMs) and associated costs. CDCR will then explore financing opportunities to initiate and develop energy efficiency projects at this facility.

- ASP and RJD have cogeneration plants that use natural gas to produce electricity, and thus the site energy consumption appears high; however, both of these facilities are purchasing minimal electricity from the grid.
- CIM does not purchase significant amounts of energy from the grid. It is currently under a 30-year Power Purchase Agreement (PPA) that provides both electricity and steam to the facility. CDCR is currently working with DGS on a new seven-year contract to continue purchasing energy off-the-grid.
- CMC is currently under development to have an energy-efficiency project that includes interior and exterior lighting measures, as well as the replacement of dorm water heaters. CDCR is planning to apply for a DGS revolving fund loan to implement this project.
- COR has an Investment Grade Audit in process that will assist in prioritizing energy efficiency opportunities that are cost effective. CDCR has reserved On-Bill Financing (OBF) for these projects.
- SATF, CMF, SAC, and CCI are all being considered to receive the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) energy efficiency Level II audits in order to assess opportunities at each of these facilities, such as installing variable frequency drives on air handling units, as shown in below.

Figure 11- Air Handling Unit

Figure 12- Variable Frequency Drive

CDCR's Challenges in Meeting State Goals

- Security – CDCR's mission to improve public safety through law enforcement that provides for the safe and secure incarceration of the State's most serious and violent felons and to provide parole supervision and develop and implement rehabilitative strategies to successfully reintegrate offenders back into their communities is the first priority of the Department. As such, security requirements sometimes limit the energy efficiency options available to the Department. One example is that LED lighting is not currently approved for use in inmate cells due to the metal strips found within the lamps that can be used by the inmates as weapon stock. CDCR follows Design Criteria

Guidelines (DCG) and policies that ensure safety and security for inmates, staff, and the public. All new technologies must be analyzed, reviewed, and approved by the CDCR Design and Environmental Services and Standards Branch (DESS).

- Needs of 24-hour operations – Unlike typical office environments that have limited hours of operation, CDCR operates on a 24-hour basis, which is much longer than many other State Agencies.
- Unique utility drivers – The size of CDCR institutions has created a need to function independently of typical city-provided services. Unlike typical office building environments, CDCR runs water and wastewater plants serving its facilities, and even at times serves surrounding properties, both public and private. These systems are often expensive to replace with higher efficiency systems, leading to increased costs until sufficient funding is identified.
- Financing – Despite the challenge of implementing energy-related projects without a budget line item specifically designated for energy efficiency, CDCR has been successful in fulfilling many of the mandates of energy efficiency and sustainability. CDCR has sought out various funding opportunities as they become available and has taken the lead in promoting additional funding opportunities by participating in policy discussions on topics such as OBF and On-Bill Repayment (OBR). CDCR has utilized multiple funding opportunities including Green Seal $Mart loans, OBF, American Recovery and Reinvestment Act (ARRA) loans, Energy Conservation Assistance Act (ECAA) loans, and SPPAs.
    - One challenge of the existing OBF program is a funding limitation of $1-$2 million per site and/or utility account, CDCR has had to limit the scope of energy efficiency projects in order to remain under this cap. The IOUs are working with CDCR and the California Public Utilities Commission (CPUC) to raise this limit where feasible.
- Aging infrastructure – CDCR is not sufficiently funded to address its aging infrastructure. Recent facility condition assessments conducted by a third party have identified a backlog of infrastructure repairs and replacements at a cost of more than $10 billion. Current funding levels are substantially insufficient to address this backlog with efficiency projects competing for these fiscal resources as well. Where possible, though, CDCR has tried to pair a needed infrastructure repair or replacement with an energy efficiency opportunity that is third-party financed (i.e., loans, rebates, etc.) to address both areas.
- Incentives for EEMs – Some of the potential measures that align with CDCR's energy efficiency goals no longer qualify for incentives, which exclude the measures from OBF. A few examples include the replacement of incandescent lights with LED lights, replacing exit signs, and replacing linear fluorescents with LEDs. If the measures do not qualify for the incentive/OBF, then facilities that have outdated technology may not have a project initiated unless alternate funding is available.

- Lack of designated Energy Star category for correctional facilities – To obtain LEED EB, a property owner is required to achieve an Energy Star Rating of at least 75 percent; however, the EPA's Energy Star program does not have an established category for correctional facilities.
- Networking capabilities – CDCR is limited on the availability of a connectivity backbone to implement facility-wide energy management systems (EMS). The existing infrastructure backbone is either not serviced any longer or only available for Health Care services. Installation of EMS becomes cost-prohibitive if a backbone has to be added as part of the cost of the energy efficiency project. Other networking paths will have to be evaluated for feasibility and cost-effectiveness.
- Limited Operations and Maintenance budget – Each facility's operation and maintenance budget is based on the number of inmates housed there regardless of building square footage. Each facility receives $277 per inmate per year as their respective annual maintenance allowance. This can impact each facility's ability to service its equipment as needed in order to maintain maximum efficiency.

Some examples of CDCR's promotion of the State's energy and sustainability goals include:

- CDCR actively promotes these goals through its Going Green website and involvement of these goals at the highest levels of the Department, in addition to participating in many programs and winning several awards that promote sustainability goals.
    - US EPA Green Power Partnership member
    - Climate Registry member
    - GO-Biz Electric Vehicle Infrastructure Task Force member
    - Governor's Sustainability Task Force and Drought Task Force member
    - 2011 Pacific Gas & Electric Company (PG&E) Integration Award (incorporating sustainability into operations)
    - 2015 Winner of the Cool Planet Award from Southern California Edison (SCE) and the Climate Registry
    - 2017 Featured speaker on Sustainability at the American Correctional Association (ACA) conference in San Antonio, Texas
    - 2017 Attendee of California Climate Adaptation Forum
- Sixty+ LEED certified buildings completed.
- A demonstration project to test the efficiency of LED lighting of CDCR's yards and perimeters was conducted last year at Mule Creek State Prison (MCSP), measuring light levels before and after, and customer satisfaction. This demonstration proved successful and LED is now the Department's standard for security high mast lighting and exterior wall-mount fixtures.
- CDCR's FPCM produces a monthly executive briefing document of all energy projects, planned or in progress, to ensure CDCR executives are actively engaged in the

Department's commitment to the State's energy and sustainability goals. This report tracks CDCR's progress in meeting these goals and also identifies any challenges so they can be resolved accordingly.

- CDCR is the first and only State Agency/department to solicit and award wind-generated power for its facilities, with three projects totaling 5.5 MW in the planning or construction phase.
- CDCR includes a third-party sustainability consultant as well as a commissioning agent on its major construction projects to ensure compliance with its sustainability goals.

CDCR's Five Year Capital Improvement Program

CDCR prepares a *Five Year Infrastructure Plan* (Plan) which provides a narrative report summarizing the Department's Capital Outlay priorities that are anticipated over the next five years. The Plan is submitted along with the fully developed Capital Outlay Budget Change Proposals for the first year represented in the Plan, along with Budget Concept Statements for each proposal for which funding will be pursued in the four subsequent out-years. The Plan includes the following sections: Infrastructure, Division of Juvenile Justice, Facility Maintenance, Energy, and Categorized Proposals (Fire/Life/Safety, Health Care, Housing, Adult Programs, Security, Support Services, and Utilities).

CDCR also develops a Master Plan Annual Report (MPAR). This report includes proposed projects contained in the Department's most current *Five Year Infrastructure Plan*, active and completed projects within the reporting period, and narrative sections on population, Gap Chart, infrastructure, housing needs, adult healthcare, and institution project summaries.

CDCR's efforts in energy management, sustainability, and conservation to meet the Governor's EOs, existing laws, and regulations are documented within these reports.

- The 2016 MPAR can be accessed at the link below.
  2016 Master Plan Annual Report

Per California Penal Code Section 7000 and 7001 (provided below), CDCR has the authority to plan and construct facilities and renovations included within the Department's master plan (*Five Year Infrastructure Plan*). Depending on workload, CDCR may delegate a portion of these projects to DGS, some of which may be energy-related projects. CDCR and DGS project teams conduct ongoing meetings to monitor this workload.

California Penal Code Section 7000

(a) The Department of Corrections and Rehabilitation shall prepare plans for, and construct facilities and renovations included within, its master plan for which funds have been appropriated by the Legislature.

(b) "Master plan" means the department's "Facility Requirements Plan," dated April 7, 1980, and any subsequent revisions.

California Penal Code Section 7001

Any power, function, or jurisdiction for planning or construction of facilities or renovations pursuant to the master plan, which is conferred by statute upon the Department of General Services (DGS), shall be deemed to be conferred upon the department.

Zero Net Energy (ZNE)

The Governor has set forth the following ZNE milestones for State buildings:

- 2020 – 50 percent of new construction & major renovations will be ZNE
- 2025 – 100 percent of new construction & major renovations will be ZNE
- 2025 – 50 percent of total existing building area will be ZNE

CDCR seeks to achieve ZNE at its institutions by reducing energy demand and maximizing on-site energy generation, where feasible, without jeopardizing CDCR's Mission. Projects must be designed with EEMs and evaluated consistent with the ZNE Guidelines.

CDCR's challenges in meeting the Governor's ZNE goals:

- Magnitude - The size and age of many CDCR facilities results in high energy use requiring substantial renewable power for offset.
- Location - Many CDCR institutions are in remote areas not in the IOU territories, which restricts the funding sources available for EEMs. Additionally, many CDCR institutions are in areas with climate concerns - extremes that lead to higher than average energy use as well as difficult construction conditions much of each year.
- Security - Correctional security requirements restrict some power-saving measures such as lighting level reductions in inmate-accessible areas and providing trellises or other shade structures on exterior walls within the secure perimeters of the prisons.
- Land availability - CDCR has made great progress in achieving more renewable generation through on-site solar fields at a significant number of its facilities, and embarking on wind generation at a few select sites. However, some prisons do not have the available land to achieve this and some of these sites may not be appropriate for wind power generation due to environmental restrictions regarding bird habitat. Where possible, CDCR has shifted to installing solar canopies in its parking lots despite some initial concerns that these structures could "hide" suspicious activities on prison grounds that may pose security challenges to CDCR.
- Deferred maintenance - With its aging portfolio, the challenge of ensuring that 50 percent of this existing stock meets ZNE requirements must be balanced with limited funding available to meet the needs associated with aging and obsolescence.

CDCR's approach to new construction to achieve the Governor's ZNE goals for State buildings is detailed in CDCR's FPCM Project Procedures Manual (PPM) and DCGs. The following are significant excerpts/paraphrases from each manual.

Project Procedures Manual on ZNE

Each project managed by CDCR's Project Management Branch (PMB) must have a Project Management Plan developed specifically for the project that will include and address each element of the PPM. The Project Management Plan Guideline directs the following in its Sustainable Design Guidelines (SDG) and ZNE article:

- The Project Director (PD) must review each project for incorporation of sustainable design and ZNE Certification. In this review, the PD must identify the current EO and version of USGBC's LEED criteria applicable to the project, as well as outlining the documentation that will be required under LEED and ZNE Certification and develop a project-specific plan to implement sustainable design guidelines.
- During the establishment of the project scope and budget, CDCR will determine if the project will be ZNE-certified and identify the method that renewable, on-site energy generation will be provided.
- The PD must meet with CDCR's Energy and Sustainability Section (ESS), determine the most appropriate path for compliance with the current EO based on the options identified in the CDCR SDG (ZNE-certified or exempt), and review project constraints that may affect eligibility for ZNE Certification and/or use of sustainable practices.

Design and Construction Guidelines on ZNE

The CDCR's SDG for use by State and contracted architectural and engineering firms designing CDCR projects establishes general sustainable design principles for the design of correctional facilities for CDCR, in accordance with current administrative directives, regulatory requirements, and its policies. The SDG is incorporated into the DCG, and also serves as a reference for the DCG as it relates to sustainability. The SDG is updated periodically to incorporate new or revised documents that affect LEED certification requirements, ZNE Certification, regulatory requirements, CDCR policies, and Title 24 requirements.

Key components relative to ZNE goals and mandates include:

- CDCR will self-certify ZNE compliance in accordance with the SDG.
- Fifteen key excerpts from EO B-18-12, its accompanying *Green Building Action Plan*, and MM 15-04 are listed as applicable to CDCR design and construction.
- CDCR adopted definitions for "Zero Energy Building", "Zero Energy Campus", and "Zero Energy Portfolio" consistent with the U.S. Department of Energy and the State of California's *State Agency Compliance* with EO B-18-12 definitions for ZNE.
- New buildings and major renovations will be evaluated separately from the existing institutions' buildings.
- New buildings and major renovation will exceed the requirements of Title 24, Part 6 – Building Energy Efficiency Standards by a minimum of 15 percent, prior to the use of on-site renewables.
- New buildings and major renovation will be provided sufficient metering to document actual ZNE performance and support future Monitoring Based Commissioning (MBCx).

- New buildings and major renovation may utilize existing on-site energy generation for ZNE, provided that the existing on-site generation is available and not designated for other applications. If no on-site energy generation is available, the new building will need to include new renewable energy generation to achieve ZNE.
- It is CDCR's intent to maximize the total building area that is certified as ZNE at each adult institution and youth facility, based on available on-site renewable energy generation. CDCR reserves the right to exempt buildings from ZNE requirements if public safety is jeopardized by pursuing ZNE certification.
- Existing institutions and youth facilities will be evaluated as a campus utilizing CDCR's Zero Net Energy Procedure that is part of CDCR's FPCM PPM.
- Pursuant to the State authorized exemptions[4], CDCR will exempt the following from ZNE calculations:
    - Site Security Lighting
    - Lethal Electrified Fence
    - Water Treatment
    - Wastewater Treatment
- It is CDCR's intent to comply with the ZNE requirements for State Agencies outlined in EO B-18-12 for its portfolio of adult institutions and youth facilities. CDCR intends to certify a minimum of 50 percent of existing building area throughout its entire portfolio. However, with over 48 million square feet of existing buildings it will be extremely challenging to improve the efficiencies or achieve the ZNE requirements for a substantial portion of this inventory without a major influx of funding. Building area will be determined by the values indicated in the Energy Star Portfolio Manager (ESPM) database.
- CDCR's designated ZNE projects will be certified as either ZNE buildings or ZNE campuses (or potentially a ZNE portfolio). CDCR's FPCM will utilize a reporting document to track ZNE performance for the building, campus, or portfolio certified. The document will track annual Total Energy Production and Total Energy Consumption for each ZNE-designated project on a monthly basis for each calendar year at the completion of the project. **Table 19** (below) provides an overall review of the CDCR portfolio while **Table 20** details each ZNE project at each institution.

[4] MM 14-07 Standard Operating Efficiency Procedures shall be followed to next extent they do not conflict with health and safety requirements or operations necessary for CDCR to fulfill its mission and responsibilities.

Table 19- Zero Net Energy Buildings

Status of ZNE Buildings	Number of Buildings	Floor Area (ft^2)
Buildings in Design	1	~375,000
Buildings in Construction	31	186,702
Buildings in Auditing Phase	8	39,606
Totals for ZNE Buildings	40	601,308
Totals for All Institutions	6,438	48,291,947
% ZNE	.6%	1.2%

Table 20- Zero Net Energy Projects

Institution	Project Name	Building Name	Status	Floor Area (ft^2)
California Correctional Institution	HCFIP SP#2	New Pharmacy and Laboratory Building	In Construction	2,205
	HCFIP SP#5	Facility D Primary Care Clinic	In Construction	3,876
	HCFIP SP#6	Facility E Primary Care Clinic	In Construction	3,876
Central California Women's Facility	HCFIP SP#4	New Pharmacy	In Construction	2,244
California Men's Colony	HCFIP SP#1	New West Facility Primary Care Clinic	In Construction	5,268
	HCFIP SP#4	New East Facility Primary Care Clinic and Health Care Administration Building	In Construction	13,044
	HCFIP SP#5	New Pharmacy and Laboratory Building	In Construction	3,000
	HCFIP SP#6	New East Facility ASU Primary Care and ASU-EOP Mental Health Clinic	In Construction	11,000
CSP, Corcoran	HCFIP SP#2	New ASU Primary Care Clinic	In Construction	2,559
Correctional Training Facility	HCFIP SP#1	New Facility A Primary Care Clinic	In Construction	3,468
	HCFIP SP#4	New Facility C Primary Care Clinic	In Construction	2,880
	HCFIP SP#7	New Facility D Primary Care Clinic	In Construction	3,614
Chuckawalla Valley State Prison	HCFIP SP#3	New Health Care Administration and Health Records Building	In Construction	2,880
Folsom State Prison	HCFIP SP#1	New Minimum Support Facility Primary Care Clinic	In Construction	3,072
	HCFIP SP#2	New Building 1 Primary Care Clinic	In Construction	3,268
	HCFIP SP#3	New Central Health Services Building and Education Annex Building	In Construction	17,978
Ironwood State Prison	HVAC	Portion of Campus - Facilities A & B	In Design	~375,000
CSP, Los Angeles County	HCFIP SP#1	New ASU Primary Care Clinic	Construction Complete, Auditing Phase	2,594

Institution	Project Name	Building Name	Status	Floor Area (ft^2)
	HCFIP SP#2	New Complex Primary Care Clinic (Facilities A & B)	Construction Complete, Auditing Phase	5,573
	HCFIP SP#3	New Complex Primary Care Clinic (Facilities C & D)	Construction Complete, Auditing Phase	5,573
	HCFIP SP#5	New Health Care Administration and Health Records Building	Construction Complete, Auditing Phase	5,921
Mule Creek State Prison	HCFIP SP#2	New Clothing Exchange Buildings (Facilities A, B and C)	In Construction	5,357
	HCFIP SP#3	New ASU Primary Care and ASU-EOP Mental Health Clinic	Construction Complete, Auditing Phase	611
	HCFIP SP#4	New Pharmacy and Laboratory Building	Construction Complete, Auditing Phase	2,471
North Kern State Prison	HCFIP SP#2	New Facility B Primary Care Clinic	In Construction	2,873
	HCFIP SP#3	New Facility C Primary Care Clinic	In Construction	4,835
	HCFIP SP#4	New Facility D Primary Care Clinic	In Construction	3,873
	HCFIP SP#5	New Medication Distribution Rooms (Facilities B & D, 2 each)	In Construction	2,111
	HCFIP SP#8	New Correctional Case Management Building	In Construction	5,038
Richard J. Donovan State Prison	HCFIP SP#1	New ASU Primary Care and ASU-EOP Mental Health Clinic	Construction Complete, Auditing Phase	9,880
	HCFIP SP#3/8	New Pharmacy and Dialysis Unit Building	In Construction	8,389
	HCFIP SP#4	New Health Care Administration Building	In Construction	7,680
CSP, Sacramento	HCFIP SP#1	New Facility A PSU-ASU Primary Care Clinic	In Construction	6,578
	HCFIP SP#3	New Central Health Services Building	In Construction	28,089
CSP, Solano	HCFIP SP#1	New Complex Facility Clinic	In Construction	12,258
Salinas Valley State Prison	HCFIP SP#1	New ASU Primary Care Clinic	In Construction	2,687
Wasco State Prison	HCFIP SP#3	New Facility C Primary Care Clinic	In Construction	4,835
	HCFIP SP#4	New Facility D Primary Care Clinic	In Construction	4,236
	HCFIP SP#5	New Medication Distribution Rooms (Facilities B & D, 2 each)	In Construction	2,111
	HCFIP SP#8	New Correctional Case Management and Health Care Administration Building	Construction Complete, Auditing Phase	6,983

Solar Photovoltaics and Wind Generation with Respect to ZNE

It is the intention of CDCR to ensure that buildings are as energy efficient as possible before applying renewable power to achieve ZNE per MM 2017-04 (*Zero Net Energy for New and Existing State Buildings*). See example case in **Figure 13**.

Energy Efficiency Measures with Respect to ZNE

EEMs and issues that CDCR consider in the design of new buildings include:

- Site location
- Insulation on exterior vs interior, to expose thermal mass to occupied areas
- Phase change material (PCM) on walls or ceiling
- Shade trellis on walls
- Shading devices for windows
- Building orientation on the site
- Lighting Power Density
- Daylight controls
- Occupancy sensors
- Exterior lighting controls and type
- Daylighting, including solar tubes and high clerestory glass
- HVAC system type (e.g. Variable Refrigerant Flow)
- Heat pump water heater
- Heat waste reuse
- Plug load management
- Operating hours
- Thermal storage
- Energy cost
- Temperature comfort range
- Evaporative pre-cool outside air

Figure 13- CDCR Zero Net Energy Case Study

Health Care Administration Building (HCAB) at Chuckawalla Valley State Prison (CVSP), Blythe

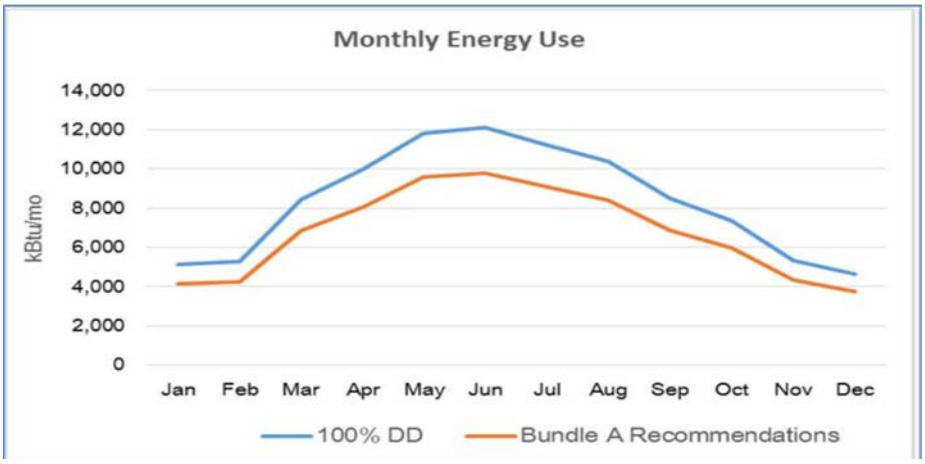
CDCR's first ZNE designed building was selected at a site where a substantial photovoltaic (PV) array exists, intending to apply a portion of the PV output towards the ZNE requirement. More than 25 potential energy efficiency measures (EEMs) and strategies were identified for the CVSP HCAB. Each was analyzed using energy modeling to show the potential impact on the current design. The results of this analysis are reported as potential changes in EUI, energy cost, initial construction cost and estimated delta to the current estimated base design cost, and other functional considerations.

The recommendations resulted in an additional forecasted energy use reduction of 19 percent compared to the 100 percent Design Development (DD) design. This means that 19 percent less PV will need to be allocated to meet the Net Zero goal. The recommended EEMs have an immediate simple payback when the avoided cost of more PV is included in the payback calculations. The team included the cost of avoided PV in all calculations to show that lower EUI reduces the cost of PV needed to achieve ZNE. The EEMs evaluated consider the project has completed DD and did not investigate changes to the orientation and massing of the building.

The EEMs recommended for HCAB to achieve annual ZNE design include:

- R-19 wall insulation
- Viracon VNE 1-63 glazing, or performance equal
- Increased efficiency of HVAC
- Additional automatic lighting controls (photocells)
- Aggressive plug load management

The chart below demonstrates the monthly energy use of the 100 percent DD design and the recommended ZNE design. Annual energy use reduction is 19 percent.



New Construction Exceeds Title 24 by 15 Percent

60+ USGBC® CERTIFIED BUILDINGS
All LEED Silver® level or higher

All new State building construction over 5,000 square feet and major renovations are required to exceed Title 24 by 15 percent. Although prisons are specifically exempted under Title 24 (Part 6, California Energy Code for Non-Residential Buildings, current edition, Institutional Group I buildings) due to their unique construction characteristics, CDCR has nonetheless imposed Title 24 adherence and, in certain instances, this later standard of exceedance in design criteria used by selected architectural firms. The following projects completed since July 2012 were designed to meet this requirement:

- Dewitt Nelson Correctional Annex is now operating as the California Health Care Facility (CHCF), Facility E. The Design Criteria for the Design-Build contract (CHCF DB3) was established prior to July 2012 yet required energy models to be prepared as required by Savings By Design (SBD) and required LEED certification for the two largest (greater than 10,000 sf) new buildings and site improvements. Those two buildings were each required to demonstrate their design to reduce their building baseline energy profile by at least 26 percent below a Title 24 minimum energy requirement baseline.
    - SBD documents for the two new buildings document that the Whole Building Approach to qualification was used and the minimum of three EEMs incorporated resulted in a model exceeding Title 24 by 28.9 percent and 35.3 percent.
- Mule Creek State Prison (MCSP) Level II Dorm Complex (Data Pending)
- Richard J. Donovan (RJD) Level II Dorm Facility (Data Pending)

Table 21- New Construction/Major Renovations Exceeding Title 24 by 15%

Projects Exceeding Title 24 by 15%	Number of Projects	Floor Area (ft^2)
Completed Since July 2012	3	881,886
Under Design or Construction	34	423,679
Proposed Before 2025	2	92,155

Figure 14- Daylighting in MCSP Level II Dorms

Design and Construction Guidelines on Exceeding Title 24

As mentioned previously, the unique nature of correctional facility construction has allowed CDCR facilities to be exempt under Title 24. However, CDCR has incorporated energy-efficiency requirements into its design criteria documents. New construction and major renovation projects in CDCR's *Five Year Infrastructure Plan*, which are not exempted from Title 24, will be designed to exceed Title 24 by 15 percent.

As previously stated, the SDG establishes general sustainable design principles for the design of correctional facilities for CDCR and serves as a reference in regard to LEED and ZNE certification, regulatory requirements, CDCR policies, and Title 24 requirements, among other things.

- The SDG requires energy modeling to demonstrate that the project meets energy targets established by EOs, CDCR, LEED energy-efficiency prerequisites and credits, and requirements for SBD incentive applications.
- Design decisions must be based on energy modeling and life-cycle cost analysis.

Reduce Purchased Grid-Based Energy 20 Percent by 2018

EO B-18-12 requires State Agencies to reduce grid-based energy purchased by 20 percent by 2018, compared with a 2003 baseline.

CDCR is reducing its grid-based energy purchases through a variety of efforts, ranging from energy-efficiency programs to LEED certification, renewable-energy installations to

environmentally preferred purchasing, and operation practices to maintenance. All of these are integral to reducing CDCR's load on the grid.

Institutional Operations and Maintenance

The CDCR Energy and Sustainability Section (ESS) maintains ongoing communications with all institutions to ensure that each is aware of the requirements of the *Green Building Action Plan*. The ESS updates the institutions on changes to energy and sustainability mandates at the annual Associate Warden/Plant Managers conference. CDCR annually distributes Standard Operating Procedures for Energy Management in State Buildings as a reminder of the specific responsibilities for all CDCR employees.

CDCR's Department Operations Manual and the Facilities Asset Management Branch (FAMB) provide the operations and maintenance policies and procedures for all institutions. Each institution is responsible for developing and updating a Plant Operations Manual. Included in that Manual are detailed instructions for implementing a comprehensive maintenance program in accordance with the specific needs of the facility. CDCR's electronic Statewide Automated Preventive Maintenance System (SAPMS) is used to track all preventive maintenance and repair work for lighting, cooling and heating systems, kitchen equipment, mechanical systems, electrical systems and all other equipment/repairs throughout each institution. SAPMS currently relies heavily on the maintenance requirements needed to comply with regulations or the requirements of the equipment asset itself. Given the budgetary challenges with the operation and maintenance budget allocations, the majority of old and inefficient equipment, such as incandescent lights, are replaced through attrition.

Due to the unique nature of CDCR's facilities, there are limitations on the type of energy-efficiency measures that can be implemented at each institution. Some constraints are:

- CDCR facilities operate on a 24/7 schedule so lighting and HVAC electricity usage cannot be minimized outside of normal building hours.
- CDCR only has two facilities that have a facility-wide Energy Management System (EMS): California State Prison - Corcoran and CHCF in Stockton. The majority of CDCR's building square footage is not air-conditioned and must comply with the DCG established for each occupancy location and type, so there are few building HVAC controls that can be set to allow for a ±2-degree fluctuation from the temperature set point.
- CDCR must maintain lighting levels consistent with the DCG in interior and exterior locations for security purposes, or in places where services, such as classrooms or healthcare, are provided in accordance with the requirements of the tasks performed.
- CDCR has some incandescent lights in areas such as mechanical/electrical rooms, janitor/storage closets, and restrooms. This lighting type is being replaced through attrition or through energy-efficiency projects.
- Lighting controls are installed as part of energy projects. Most institutions have lighting controls in areas that are not inmate accessible.

Department-wide Energy Trends

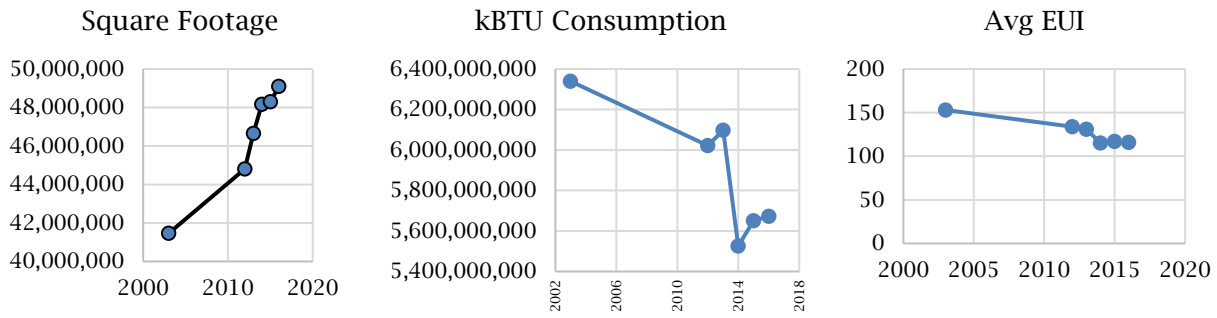
Compared to the baseline year of 2003, CDCR as of December 31, 2016, had a 17 percent increase to the Department's overall building area, which is expected to increase 20 percent by the end of 2018. The total energy consumption for the Department is over 5.5 billion kBTU with a site average EUI of 116.

For 2016, the energy usage decreased for 32 of CDCR's State-owned facilities, increased for 12 facilities, and one facility with no EUI trend as it was new and has no 2003 baseline. Department-wide, this represents a reduction of over half-a-billion kBTU's and an 11 percent decrease when compared to the 2003 baseline. The Department's average site EUI rate has continuously decreased as well. As previously noted in the challenges section, there currently is no building-use type for prisons and presents a challenge when attempting a performance comparison.

CDCR has saved millions of dollars given the two-prong approach taken to meet the goals of EO B-12-18, including the implementation of energy-efficiency projects and entering into third party PPAs. These methods provided cost savings to CDCR by ensuring permanent energy reductions and by providing a pre-determined rate approach when purchasing renewable energy.

Table 22- Department-wide Energy Trends (without Renewables)

Year	Floor Area (ft^2)	Total Site kBTU Consumption	Department Average Site EUI
Baseline Year 2003	41,457,027	6,339,377,948	153
2012	44,800,381	6,021,981,540	134
2013	46,644,879	6,097,589,607	131
2014	48,163,049	5,526,135,269	115
2015	48,291,977	5,650,116,677	117
2016	49,091,627	5,671,969,324	116
2017	TBD	TBD	TBD
2018 Goal	49,880,173	5,071,502,358	102



As **Table 22** and the corresponding graphs indicate, the footprint of CDCR has grown by over 8.3 million square feet from 2003 to 2016 with further construction adding to this. Despite the growth, and through extensive conservation and retrofit efforts, CDCR has consistently reduced

energy consumption. The continuation of the energy efficiency program and the expansion of the renewable program are integral ways for CDCR to meet the Governor's sustainability goals.

Table 23- 2016 Energy Reductions Achieved (without Renewables)

Purchased Energy Compared to Baseline	Number of Facilities	Floor Area (ft^2)	Current Year kBTU Consumption	Percent of Total Energy
20% Reduction Achieved	17	13,381,489	1,326,380,363	23%
Less than 20% Reduction	24	30,537,197	4,123,434,004	73%
Unspecified Baseline (if any)	4	5,172,941	222,154,957	4%
Totals	45	49,091,627	5,671,969,324	100%
Department-wide Reduction	**11%**			

CDCR has two primary strategies to achieve energy reductions and comply with existing EO mandates, laws, and regulations:

1. CDCR is working with a consultant to prepare a Climate Action Plan (CAP) that will quantify GHGe and reduction measures for CDCR's core operations. The baseline GHGe inventory will be used to develop the forecasting of future GHGe, GHGe reduction targets for future years, new or expanded GHGe reduction measures to meet the targets, and an action plan that specifies how CDCR will implement these measures. The purpose of preparing GHGe forecasts is to determine changes in emissions that would occur in the future, relative to baseline conditions. The forecasts are necessary to illustrate the potential effects of growth in population, employment, or other factors that could result in changes to future emissions, such as actions others may take in response to existing laws and regulations.
2. CDCR plans to continue to develop and implement energy efficiency projects through the CDCR/IOU Partnership program, special repair, grants, and other opportunities. CDCR and the IOUs have developed a statewide energy efficiency audit schedule in the IOU territories **(Table 24)**. These audits will be used for planning future energy efficiency projects. Additionally, CDCR has had preliminary discussions with the California Conservation Corps as an option to conduct energy efficiency audits in non-IOU territories.

a. Through the IOU partnership, energy audits were originally performed in 2006 for the institutions within the IOU territories. Currently, CDCR and the IOUs are working on a master schedule and prioritization of energy efficiency audits to use as a planning tool for future energy efficiency projects. PG&E is reviewing existing audit data, working with CDCR on prioritization, and planning for these audits. Southern California Edison (SCE) is completing a comprehensive energy audit at CCI and collaborating with CDCR on prioritization and the level of audit details for the institutions within SCE territory. CDCR is exploring other energy audit opportunities for the institutions that are not within the IOU territories. Some of these opportunities include utilizing existing Architect/Engineer retainers or the California Conservation Corps.

Table 24- Energy Surveys

Fiscal Year	Total Department Floor Area (ft^2)	Energy Surveys Under Way (ft^2)		Percent of Department Floor Area (ft^2)	
		Level 1	Level 2	Level 1	Level 2
2005-2006	41,457,027	0	9,196,993	0	18%
2007-2008	41,457,027	0	5,252,136	0	10%
2016-2017	49,091,627	0	2,624,739	0	5%
2017-2018	49,521,833	0	36,134,439	0	72%

Energy Efficiency Program

CDCR leverages existing resources using strategic partnerships with California's IOUs to assess and implement energy efficiency projects, utilize rebates, and obtain zero-percent loans through the partnership, as administered by the California Public Utilities Commission (CPUC) for energy saving projects. CDCR also locates and secures grants, loans, incentives and rebates for energy efficiency projects such as energy-efficient boilers **(Figure 15)**.

Figure 15- Installation of New Energy Efficient Boilers at CCI

In accordance with Government Code Sections 4217.10-4217.18 and Public Utilities Code Section 388, CDCR establishes a pool of Energy Service Companies (ESCOs) to compete in a Request for Proposal process for energy efficiency projects. Performance-based energy savings contracts are awarded based on the following: Preliminary Assessment, Proposal Evaluation, Project Application, and Investment Grade Audit. CDCR's current pool consists of 10 qualified ESCOs.

Table 25- Summary of Energy Savings Achieved through Energy Efficiency Projects

Year Funded	Energy Savings (kBTU/yr.)
2010-2012	188,762,876
2013	32,324,937
2014	68,117,968
2015	18,602,129
2016	10,836,062

Since the start of the CDCR/IOU Partnership program in 2006, CDCR has completed 105 energy efficiency projects in existing buildings and new construction. The total cost of the energy efficiency projects is approximately $71 million, which have been funded from support funds, loans and/or grant programs. The IOUs have paid over $18 million in incentives, resulting in an overall annual savings of $8.5 million for CDCR. These savings are used to repay the grant or loan programs; after these debts are retired, these projects provide ongoing energy and cost savings. **Figure 16** and **Figure 17** highlight a lighting retrofit project at the California Training Center in Galt.

Figure 16- High Pressure Sodium Fixtures

Figure 17- Energy Efficient LED Fixtures

Leadership in Energy and Environmental Design

The USGBC developed green building rating systems to advance energy, material efficiency, and sustainability known as LEED for Building Design and Construction (LEED BD+C), LEED for Building Operations and Maintenance (LEED O+M), and LEED Interior Design and Construction (LEED ID+C). EO B-18-12 and the *Green Building Action Plan* require new State buildings and major renovations of 10,000 square feet or more, to be designed, constructed, and certified at LEED Silver or higher; also new State buildings under 10,000 square feet must meet applicable California Green Building Standard's Tier 1 measures.

Additionally, the *Green Building Action Plan* requires all existing State buildings over 50,000 square feet to complete LEED O+M certification and meet an Energy Star rating of 75 (or an alternate energy standard established by the California Energy Commission) to the maximum extent that such certification is cost-effective.

CDCR has made significant progress in designing and constructing new Capital Outlay Projects to meet the LEED BD+C Silver or Gold rating. LEED certification details were noted previously in the Green Operations Building Design and Construction section. There are eight additional projects in various phases of design or construction that are projected to meet a minimum of LEED-Silver rating. The RJD Level II Dorm facility (multiple buildings) is pending LEED- Silver certification **(Figure 19)**. The remaining projects are HCFIP buildings located at CCC, CMC (two buildings), FSP, SAC, and SOL, and a new Central Chiller Plant at ISP.

CDCR has identified 23 buildings that are eligible for LEED O+M certification but obtaining this certification is challenging. Currently, most CDCR prisons have only one master utility meter installed. Sub-meters must be installed on eligible buildings in order to obtain an Energy Star rating needed to meet the requirements for LEED O+M certification. In addition, Energy Star ratings currently do not exist for correctional buildings throughout the country. CDCR is in the process of installing sub-meters on two qualifying buildings (CHCF Shared Services Building and at the new Central Health Care Services Building at SQ; **Figure 18**) to collect one year's data to fulfill the prerequisite baseline information and to help develop the standards for a correctional facility Energy Star rating. Both buildings are anticipating LEED O+M certification.

Figure 18- Central Health Services at SQ

CDCR has allocated funding to award a phased contract for building sub-metering for the remaining 21 buildings. CDCR is planning to evaluate the LEED O+M Volume Certification Program based on the results of the two pilot projects. Additionally, CDCR has joined a working group of other correctional organizations throughout the country, as well as the US Department of Energy (US DOE), in lobbying the US Environmental Protection Agency (US EPA) to create a category for correctional facilities that will be recognized by the Energy Star rating criteria. The US DOE is optimistic that the US EPA will grant the addition of this category, allowing CDCR and others to make better progress in measuring and improving upon existing building performance levels.

Figure 19- CDCR LEED Case Study

Richard J. Donovan Correctional Institution (RJD), San Diego

The Level II dorm is sited adjacent to the main Richard J. Donovan Correctional Facility and has been designated to house inmates requiring an Intermediate level of medical care as determined by the medical classification system. The project will obtain LEED Silver Certification. Sustainability initiatives utilized on the RJD Infill Facility project include the following:

- Replacement of originally specified site lighting fixtures with LED fixtures for energy efficiency, longevity and improved lighting quality.
- Reduction of GHGe by 10 percent and exceed the ASHRAE rating of 90.1 2007, partially accomplished with a central plant.
- On-site power generation by use of photovoltaic systems to account for more than 12 percent of the site's total energy use. This system is mounted on parking canopies, which help to reduce the heat island effect typically found in surface parking areas.
- Optimizing healthy indoor environments for all inmates and staff by using only low VOC adhesives, sealants and paints and only urea-formaldehyde free composite wood products.
- Purchasing EPP by specifying materials with a high recycled content.
- The project meets the construction activity pollution prevention requirement for LEED projects
- Preferred parking is being provided for low-emission vehicles (currently 8 percent of staff).
- Cool roof (i.e., heat reducing) materials being used for both sloped and flat roofs.
- Low-flow plumbing fixtures for inmates and staff: 1.28 GPF toilets and .5 GPM faucets.
- Indirect evaporative coolers that use a relief air stream to evaporate the water for the indirect cooler and provide a cooler water temperature.
- Use of Variable Frequency Drives (VFDs) on 100 percent of outside air units to allow for saving of both fan and heating energy.
- Chiller efficiencies exceed minimum energy standards. The two chillers provided utilize a plate and frame heat exchanger to provide free cooling with a waterside economizer cycle when temperature conditions allow.
- Seventy percent of the building areas utilize 100 percent outside air to assure the highest level of indoor air quality.
- Utilize regional materials by sources within 500 miles of the project site (e.g. casework, steel, and aluminum fabrication).
- Use of LED light fixtures for high mast lighting and inmate dorm lighting.

Demand Response

EO B-18-12 directed all State departments to participate in available demand response programs and to obtain financial incentives for reducing peak electrical loads when called upon, to the maximum extent that is cost-effective.

As stated in the executive summary, CDCR's mission is to improve public safety through law enforcement that provides for the safe and secure incarceration of the State's most serious and violent felons; to provide parole supervision and develop; and to implement rehabilitative strategies to successfully reintegrate offenders back into their communities. CDCR has developed energy strategies that fit within its primary mission. One of those strategies is to participate in demand reduction to support California in avoiding any rolling blackouts.

In 2008, CDCR developed a Demand Response program for all of its facilities. This program is updated annually and provides each site with the flexibility to maintain program operations while shifting energy-intensive activities to earlier in the day to avoid peak hours. Currently, SCE is the only IOU that has a program that provides CDCR the flexibility that a prison system needs when it comes to participation in demand response. However, all State-owned CDCR facilities participate in demand reduction regardless of whether or not there is an IOU Demand Response Program. Given the nature of the CDCR facilities, there are challenges in implementing a utility-sponsored Demand Response program. In order to shed load, extensive coordination is required which takes more time than the 24-hour notice currently given by the Independent System's Operator. The load reduction support that the facilities can offer within a 24-hour notice is to avoid increasing their load during a curtailment notice and provide a combined estimated reduction of 200kW. CDCR is able to verify participation of the institution by verifying that the loads of the participating institutions did not increase as expected during the curtail timeframe.

Table 26- Demand Response

Demand Response Participation	Number of Buildings/Sites	Estimated Available Energy Reduction (kW)
Number of Buildings/Sites Participating in 2016	39	200
Number of Buildings/Sites Participating in 2017	39	200
All State-owned Department Sites (Totals)	45	Not Tracked
All Department Sites (Percent)	87%	N/A

Renewable Energy

New or major renovated State buildings over 10,000 square feet must use clean, on-site power generation, and clean back-up power supplies, if economically feasible. Facilities with available open land must consider large-scale distributed generation through various financing methods, including, but not limited to, third-party PPAs.

Although there are no specific kW goals for renewable energy, renewable energy does count towards meeting the Zero Net Energy goal for 2025 and the 20 percent grid-based energy use reduction by 2018.

CDCR is involved in ongoing studies to review feasibility for each adult institution and is continually assessing technological advancements in wind, water, solar energy sources, and battery storage opportunities in alignment with the *Green Building Action Plan*.

CDCR has installed solar photovoltaic arrays at 12 institutions: CCI, CCWF, COR, CTF, CVSP, ISP, LAC, NKSP, PVSP, SOL, SVSP, and WSP **(Figure 20)**. CDCR generates approximately 34 MW of power annually, which is roughly equivalent to the energy required to power at least 7,333 homes. These fields were constructed by a third-party vendor at its expense in exchange for CDCR purchasing the electrical power from the solar field operator at discounted rates, allowing CDCR to reduce projected energy costs by approximately $75.1 million over the next 20 years. CDCR has also installed several smaller solar arrays (5-25 kW) on several newly constructed buildings to meet the energy demands of these buildings and to achieve higher levels of LEED certification. Additionally, under the authority of Senate Bill 862, CDCR was given an exception to the Net Energy Metering (NEM) cap of 1 MW per site, which allowed CDCR to utilize NEM up to 8 MW. Several existing solar arrays have since been converted from non-export agreements to NEM and additional arrays will be added to many sites because of this allowance.

Figure 20- Solar Array at ISP

Additional solar projects are planned for construction during Fiscal Year 18/19 at the following institutions: CAL, CEN, CIW, CMC, FSP, KVSP, MCSP, SAC, VSP, WSP, PVSP, and VYCF. These projects are estimated to bring an additional 28 MW into CDCR's renewable energy portfolio. CDCR is also in the bidding process to expand renewable generation at ten existing prison sites adding as much as 26 additional MW of renewable capacity.

Additionally, CDCR has three projects awarded to install wind turbines at CTF, LAC, and SVSP. The turbine at LAC **(Figure 21)** became operational in December 2017 and the CTF/SVSP turbines are scheduled to begin construction in Spring 2018. These wind projects will increase the Department's renewable energy portfolio by approximately four MW. This will significantly contribute to CDCR's renewable energy portfolio and put the Department on track to exceed the power grid reductions specified in EO B-18-12.

Figure 21- Wind Turbine at LAC

Based on the current plan, over 30 percent of CDCR's total power is expected to be powered by renewable energy. By 2018, CDCR will achieve a 20 percent reduction on energy use compared to a 2003 baseline, thereby complying with the Governor's EO.

Table 27- On-Site Renewable Energy

Status	Number of Sites	Capacity (MW)	Estimated Annual Power Generation (kWh)
Renewables In Operation or Construction	22	66.12	132,260,000
Renewables Pro posed	17	45.9	91,800,000
Renewable Totals[5]	31	112.02	224,060,000
Department Wide Totals	45	N/A	769,960,201
Department Wide Renewable Percent	69%	N/A	29%

Monitoring Based Commissioning (MBCx)

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

MBCx can help CDCR develop a prioritized energy management roadmap. With real time data from MBCx, CDCR can continually address inefficient facilities and buildings that are drifting out of calibration. As building systems change, user requirements shift, or energy economics fluctuate, the building with MBCx can keep pace. Traditionally, the IOUs' MBCx programs have required a remote access for implementation. Given the safety and security requirements at CDCR institutions, these programs did not meet the Department's DCG and could not be considered. Currently, the IOUs are in the process of defining new programs. Once these programs are finalized and readily available for customers, CDCR is planning to assess the available options and determine if the new programs can meet safety and security requirements.

Financing

State agencies are required to pursue all available financing and project delivery mechanisms to achieve these goals including, but not limited to: state revolving loan funds, utility OBF, PPAs, GS $Mart, Energy Service Contractors (ESCOs), or other available programs.

CDCR has been successful in fulfilling many of the State mandates of energy efficiency and sustainability. CDCR has sought out various funding opportunities as they become available and has taken the lead in promoting additional funding opportunities by participating in policy discussions on topics such as OBF and OBR.

CDCR has utilized and will continue to explore multiple funding opportunities including GS $Mart loans, OBF, municipal utility company loan and incentive programs, ARRA loans, ECAA loans, Department of Water Resources loans and grants, and Solar or Wind PPAs.

[5] A number of the proposed sites are already included in the operating/in-construction site count.

CHAPTER FOUR

FLEET AND ZERO EMISSION VEHICLES INFRASTRUCTURE

CHAPTER 4: FLEET AND ZERO EMISSION VEHICLES INFRASTRUCTURE - OVERVIEW

CDCR is one of the largest departments in State government and over the past decade has been a leader in meeting or exceeding the Administration's energy and sustainability goals and objectives. CDCR also has one of the largest State fleets, with over 9,908 total assets, including leased vehicles and mobile equipment. These fleet assets serve a number of operational needs, from large inmate transport buses that traverse the entire State, to high-pursuit vehicles used by parole agents and fugitive apprehension teams, to more standard sedans and trucks serving localized areas, just to name a few. Well over a decade ago, CDCR purchased hundreds of electric mobile vehicles to be used within prison property, reducing the number of gas-fueled cars serving this purpose. However, since 2014, CDCR has been incorporating low-emission vehicles into its statewide fleet and has worked aggressively to explore funding opportunities for grants and incentive/rebate programs offered by the Investor-Owned Utilities (IOUs) for Zero Emission Vehicles (ZEV) infrastructure and charging station equipment. However, CDCR's main challenge in incorporating ZEV assets has been the limited availability on the State vehicle contract, their limited driving range, and higher initial purchase costs. In the last two fiscal years (FYs) the number and variety of ZEVs available on the State contract has increased, although that variety is still not sufficient to meet the Department's wide-ranging operational needs. CDCR will continue to work closely with DGS in increasing its ZEV procurement in an effort to reach the target of 50 percent of light duty vehicles by 2025.

450+ HYBRID AND ZERO EMISSION VEHICLES

To accommodate a future green fleet, CDCR modified its design guidelines to require ZEV stations at new facilities, adding ZEV stations at its newest facility in Stockton in 2013 and at two facilities that were completing construction and one at a large leased correctional facility in 2016. These policies will remain in effect for all future expansion projects. CDCR is working with NRG Energy Inc. (an integrated American power company engaged in producing, selling, and delivering electricity, related products, and services) in pursuit of "no-cost" infrastructure for up to 10 Level 2 charging stations at institutions within the IOU territories (because of a settlement between NRG and the California Public Utilities Commission). Comprehensive site assessments are in progress at 23 of CDCR's State-owned facilities for this potential "free" infrastructure. In FY 16/17, CDCR began requiring proprietors of its leased facilities to include ZEV charging stations during lease negotiations resulting in the installation of several charging stations and more planned at its Sacramento office locations. In February 2017, CDCR completed a Five Year ZEV Readiness Survey, which will be used for the planning and implementation of ZEV fleet integration and the Governor's 2016 ZEV Action Plan for at least 5 percent workplace charging spaces at State-owned facilities. The ZEV survey included detailed parking data for over 120 State-owned and leased facilities to identify ZEV expansion opportunities. The planning will focus on strategies to encourage more ZEV purchases by employees, such as locating the charging in more optimal locations and shading them with

solar parking canopies. CDCR also actively participates on the GO-Biz task force in support of the ZEV initiative and is committed to California's statewide sustainability mission.

I. FLEET AND ZEV GOALS

The Governor has issued numerous executive orders (EO) directing sustainable State operations and the legislature has also passed a number of laws pertaining to sustainability. The orders, laws and related policy implementation guidelines relevant to fleets and zero emission vehicle infrastructure are:

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 GHGe, 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.

Executive Order B-16-12

EO B-16-12 directs State agencies to integrate ZEVs into the State vehicle fleet. It also directs State agencies to develop the infrastructure to support increased public and private sector use of ZEVs. Specifically, it directs State agencies replacing fleet vehicles to replace at least 10 percent with ZEVs, and by 2020 to purchase at least 25 percent replacement fleet as ZEVs.

Executive Order B-30-15

EO B-30-15 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 GHGe reduction target of 40 percent below 1990 levels by 2030 and reaffirms California's intent to reduce GHGe by 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous State agencies to develop plans and programs to reduce emissions.

2016 ZEV Action Plan

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

Assembly Bill 32 Scoping Plan

The scoping plan assumes widespread electrification of the transportation sector as a critical component of every scenario that leads to the mandated 40 percent reduction in GHGe by 2030 and 80 percent reduction by 2015.

Public Resources Code §25722.8

This statute requires reducing consumption of petroleum products by the State fleet compared to a 2003 baseline. It mandates a 10 percent reduction or displacement by January 1, 2012 and a 20 percent reduction or displacement by January 1, 2020.

State Administrative Manual & Management Memos

The following sections of the *State Administrative Manual (SAM),* and associated MM, currently impose sustainability requirements on the department under the Governor's executive authority:

- MM 15-03: Minimum Fuel Economy Standards Policy
- MM 15-07: Diesel, Biodiesel, and Renewable Hydrocarbon Diesel Bulk Fuel Purchases
- MM 16-07: Zero-Emission Vehicle Purchasing and EVSE Infrastructure Requirements

II. FLEET VEHICLES

Introduction to the CDCR Mission and Fleet

This report demonstrates to the Governor, Legislature, and the public at large the progress the Department has made toward meeting the Governor's sustainability goals related to ZEVs. Further, it identifies successful accomplishments, ongoing efforts, outstanding challenges, and future efforts.

CDCR operates adult correctional institutions and juvenile facilities throughout the State of California, as well as other divisional programs aimed at public safety and service operations. The Department's mission to "enhance public safety through safe and secure incarceration of offenders, effective parole supervision, and rehabilitative strategies" is accomplished with critical fleet assets necessary for such operations.

CDCR has 7,892 State-owned fleet assets and 1,780 leased vehicles, as identified in the Department of General Services (DGS) Fleet Asset Management database as of December 2017. The increase to the CDCR fleet from last year's report is attributed to better fleet reporting from all statewide CDCR programs based on enhanced oversight and field education. This fleet total includes heavy- and light-duty vehicles. CDCR's fleet also has 3,560 mobile equipment assets, such as electric carts and forklifts. CDCR fleet vehicles are used to perform a variety of functions, including inmate/parolee and staff transport, plant operations, construction, correctional education, food and pharmacy delivery, hazardous materials handling, information technology operations, materials and supplies transport, perimeter security, and waste management. At the adult institution and juvenile facility level, there is a wide variety of vehicles as these assets are in turn used by a number of different functional programs within a facility.

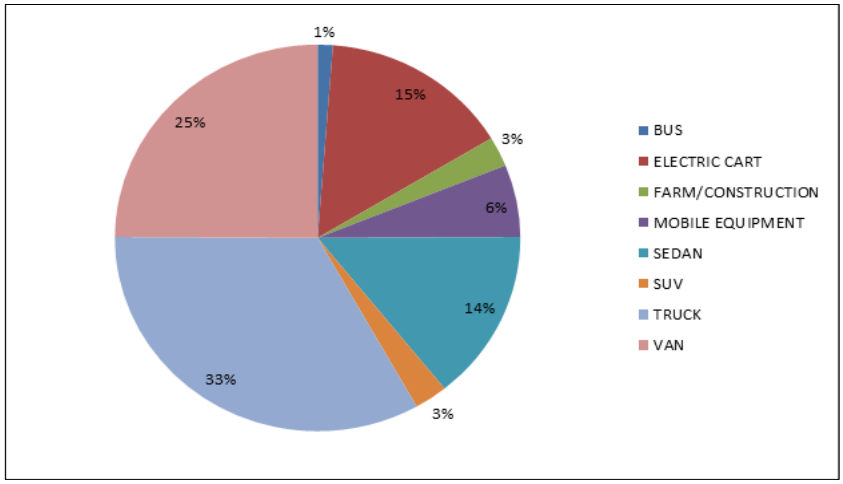
1. Sedan-type vehicles – These are most often used for administrative service functions such as staff transport or pool vehicles, inmate transport services to courts or medical appointments, high security transport and mutual aid support services, as well as custody and law enforcement services for either inmates or parolees. These vehicles

may require “high-speed pursuit” capabilities and/or be heavily modified with radio and security improvements to meet the unique needs of a correctional facility. They may also be required to be utilized at a moment’s notice to deal with emergency situations.

2. Sport Utility Vehicles (SUVs) – These are used to perform site security and plant operation functions, staff training, perimeter patrol and pursuit, as well as inmate and medical transport services. CDCR programs require the use of SUVs to house inmate security transportation cells for security and transport purposes. As a result, these vehicles also require modifications. The additional interior capacity space within SUVs provides the ability to transport multiple inmates, as well as the necessary tactical gear and equipment required by custody staff.
3. Vans and trucks – These vehicle types prove to be highly versatile for CDCR operations. Vans are used for inmate, staff, or visitor transport both on and off facility grounds. They are also used as paratransit and ambulance vehicles. Some of these vehicles will include modifications to meet correctional needs. Trucks are used for several different operations on CDCR facility grounds, including grounds maintenance and warehouse services, supply transports, food delivery services, and security patrol.
4. Buses – CDCR currently operates 30 buses servicing all institutions for the transportation of inmates to mission critical assignments and work projects.
5. Fire Engines – CDCR currently operates approximately 60 fire engines that serve institutions and are used in mutual aid agreements with local entities and other State agencies for emergency response services.
6. Farm and Construction Vehicles – CDCR operates several different types of farm and construction vehicle assets to carry out these services, including tractors, excavators, front loaders, outdoor forklifts, and utility carts to maintain surroundings, buildings, and perform minor and major construction or renovation at all facilities.
7. Electric Carts – CDCR uses electric carts daily to transport inmates, supplies, and medications within an institution.

8. Mobile Equipment – CDCR uses a variety of mobile equipment assets for grounds maintenance and plant operation services to transport materials, supplies, and equipment across facility grounds.

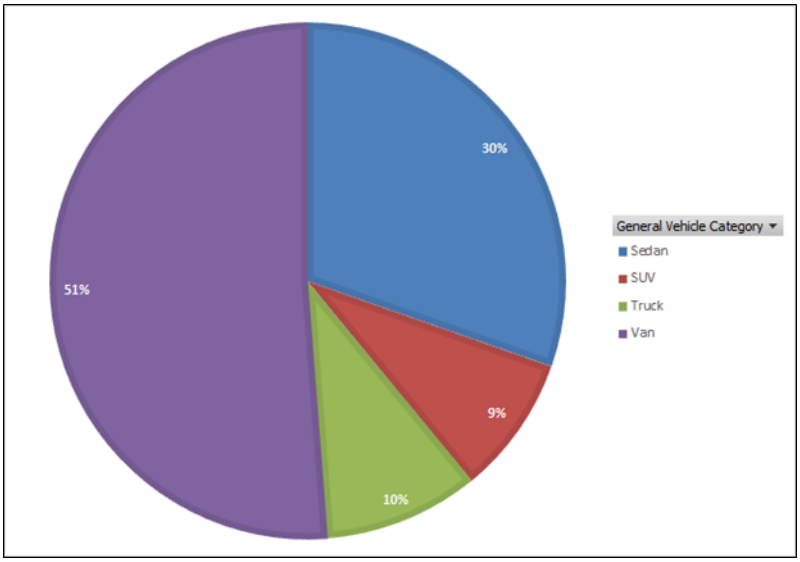
Graph 2- CDCR's Fleet Vehicle Type Breakdown



Divisional headquarter programs use vehicles in other capacities. The Office of Correctional Safety, Office of Internal Affairs, Division of Adult Parole Operations, and Board of Parole Hearings, among others, routinely travel throughout the State to monitor field operations and conduct other important work. These programs typically utilize sedan-type assets due to the amount of travel involved with their operations; however, some of these programs also use other vehicle types to aid in covert operations and criminal apprehension services.

As CDCR operates programs throughout the entire State of California, vehicles are used in all types of environments and road conditions. CDCR facilities are often located in rural and/or remote parts of the State, some in desert locations. CDCR's fire camp program may require travel across difficult terrain and non-paved roads. Additionally, because of the significant distances between facilities, some vehicles will have to travel hundreds of miles on isolated roadways to reach their destination. Conversely, a few prisons are located in urban areas with

Graph 3- Composition of Department's Light-Duty Vehicle Fleet



high-congestion traffic that can benefit from the high-occupancy vehicle exemption for commute purposes.

As of June 2017, DGS reported the average Miles Per Gallon (MPG) of the CDCR light-duty fleet was 21.08 MPG compared to 19.58 MPG in 2012 (www.green.ca.gov/fleet). This average MPG increased 7 percent based on CDCR's owned and leased inventory identified in the DGS Fleet Asset Management System database due to the adoption of hybrid electric and ZEVs into the CDCR fleet. Many of CDCR's divisional headquarter programs have shifted their vehicle models from the standard full-size sedan vehicle to mid-size hybrid vehicles. This shift has allowed CDCR to not only comply with green fleet measures and State and federal mandates, but to also achieve greater fuel efficiency, enhance operational efficiency, and realize substantial cost savings to the State.

Table 28- Total Purchased Fuel in 2017

Purchased Utility	Quantity* Gallons	Cost*
Gasoline	782,482	$ 1,865,432
Diesel	97,626	$ 292,018
Renewable Diesel	217,780	$ 581,477
Total GGE	1,097,888	$ 2,738,928

*Totals include bulk fuel purchases only.

In May 2017, CDCR's Environmental and Regulatory Compliance Section issued a statewide advisory notice outlining requirements to change from conventional diesel to renewable diesel in aboveground and underground storage tank systems. CDCR has over 10 correctional facilities currently using renewable diesel and anticipates the number of sites and amount of renewable diesel usage to increase in compliance with the DGS MM 15-07. CDCR expects this trend to continue in 2018 with an ultimate goal to convert to 100 percent renewable diesel where attainable.

Incorporating ZEVs into the State Fleet

A widespread shift to ZEVs is essential for California to meet its GHGe goals. State departments are now required to incorporate larger numbers of ZEVs in their vehicle fleets. Beginning in FY 17/18, the percentage of new light-duty vehicles that must be ZEV increases by 5 percent each year, reaching 25 percent in FY 19/20 and 50 percent in FY 24/25. CDCR has integrated 12 State-owned and 42 leased ZEVs into its fleet assets. Below is a description of the various vehicle models and potential operations. CDCR will continue to convert all fleet that are eligible for replacement to ZEVs where the opportunity and ability is available to place and utilize a ZEV-type vehicle. There are operational services within CDCR that are unable to accommodate the use of a ZEV vehicle. However, CDCR will continue to place ZEVs in all applications that are conducive to their use and will remain within compliance of the annual ZEV mandate requirement.

Battery-Electric Vehicle (BEV)

Potential roles that could be filled within CDCR through the use of BEVs could be on-grounds service operations. BEV-type vehicles could be used in an institutional setting to transport staff, supplies, or equipment across institutional grounds. Facility deliveries, visitor transport services, non-emergency perimeter check evaluations, or minor maintenance and repair duties could be services provided with these vehicles types.

Plug-In Hybrid Electric Vehicle (PHEV)

Potential roles that could be filled within CDCR through the use of PHEVs could be staff transport and pool service vehicles. As these vehicles are not as limited by range through the use of both fuel and electricity, these vehicles are more viable in staff transport operations.

Fuel Cell Vehicle

Potential roles that could be filled within CDCR through the use of Fuel Cell vehicles could also be staff transport and pool service vehicles. As these vehicles are not as limited by range through the use of both fuel and electricity, these vehicles are more viable in staff transport operations.

Vehicles that meet or exceed specified mileage and age thresholds are eligible for replacement. Currently, ZEVs are available on statewide commodity contracts in the sub-compact, compact, mid-size sedan, and mini-van vehicle classes. There are currently 289 vehicles in CDCR's fleet that are eligible for replacement in vehicle classes for which ZEVs are available on contract.

Table 29- Vehicles in Department Fleet Currently Eligible for Replacement

	Sub-Compact Sedan	Compact Sedan	Midsize Sedan	SUV	Mini Van	Total
Number of vehicles eligible for replacement	13	29	128	79	40	289*

*Data signifies light-duty vehicles with a reported odometer reading or age that meets the applicable updated replacement thresholds, based on type, according to the DGS Replacement Standards set forth in MM 17-05.

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 30- ZEV Additions to the Department Fleet (Owned Assets) by Fiscal Year

Vehicle Type	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22
Battery Electric Vehicle	3	2	2	2*	6**	6**	6**	6**
Plug-in Hybrid Vehicle	1	1	4	0*	5**	5**	5**	5**
Fuel Cell Vehicle	0	0	0	0	0	0	0	0
Percent of total purchases	10%***	10%***	10%***	15%***	20%***	25%***	30%***	35%***
Required ZEV Percentage	10%	10%	10%	15%	20%	25%	30%	35%
Total number of ZEVs in Fleet	4	7	13	15	26	37	48	59

*In FY 17/18 CDCR used previously earned ZEV credits to reduce the total number of required ZEV purchases (and still meet the 15 percent requirement)

**These figures are estimates based on average purchases of respective vehicle type. These anticipated purchases take into consideration the impact of MM 16-07 and the "ZEV/Hybrid First" Policy implemented by DGS.

***Percent of total fleet purchases represents percentage of Light-Duty vehicle purchases only, not all fleet purchases.

Telematics Plan

Telematics is a method for monitoring vehicle use. Using GPS and on-board diagnostics, telematics provides valuable information that often results in fuel savings and improved vehicle utilization. Telematics is especially important for verifying that PHEVs are maximizing the use of electric fuel rather than gasoline. The rule requiring 50 percent of ZEVs purchased to be BEVs is not in place for fleets making use of telematics for all ZEVs.

CDCR's Division of Adult Institutions' Statewide Transportation Unit (STU) has undertaken a pilot program to investigate the operative benefits of utilizing telematics. STU's pilot program includes the installation of GPS telematics devices on approximately 100 fleet vehicles. The STU plans to have all devices installed and calibrated by June 2018. Pending the conclusion of this pilot program, CDCR will determine its goals and plans for using telematics based on the findings.

Public Safety Exemption

As CDCR employs sworn peace officers, the updated rules for public safety vehicles will, in fact, affect the number of ZEVs that can be incorporated into the fleet due to the nature of the Department's operations. ZEVs cannot be consistently used in the course of CDCR peace officer duties. Such vehicles are required to be able to house peace officer equipment, weaponry, and provide enough capability to serve in pursuit and apprehension operations. Vehicles that are limited in size, range, and efficiency are not capable to serve in such capacities. Further, such vehicles often require security modifications and radio outfitting for law enforcement duties, which further prohibits the use of ZEVs in such operations. CDCR will be actively seeking all opportunities to place available ZEV vehicle types within its operations, where applications and cost may allow for such acquisitions. CDCR will need to continue to review and determine if ZEV medium-duty fleet options will be capable of supporting peace officer needs, and if such type vehicles are able to accommodate the after-market security modifications that are required for most peace officer operations.

III. ZEV INFRASTRUCTURE

CDCR Parking Facilities

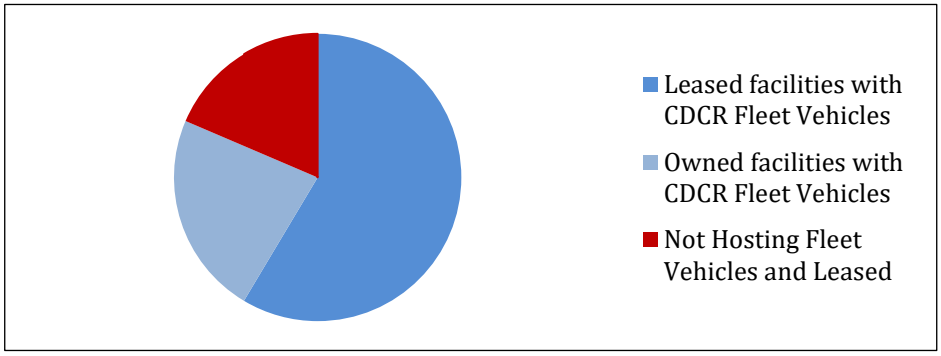
CDCR's State-owned facilities include over 46 million square feet of building space on over 24,000 acres of land statewide. CDCR leases approximately 1.8 million square feet and contracts for an additional 489,000 square feet for a private correctional facility. All of these properties have associated surface-level parking of varying sizes, in addition to the listed square feet used for employees, contractors, inmate visitors, and other members of the public. The parking is primarily located outside the secured perimeter fence. The total number of

parking spaces at juvenile facilities ranges from 150 to 300, while at adult prisons the parking spaces range from 500 to 2,500. There are also a minimal number of parking spaces located inside the secured fence adjacent to some of the facilities essential buildings. All parking spaces inside and outside of the perimeter fence are included in the total parking space calculations. A detailed breakdown of parking space type and subtotals for each specific type are identified in the Five Year ZEV Infrastructure Readiness Survey.

CDCR has 85 leased facilities located throughout the State. The parking spaces at CDCR leased facilities are also surface-level. The total number of parking spaces ranges from one to 600; however, most of the parking spaces at CDCR's leased locations are less than 100.

Based on extensive operational needs, as described earlier in this Chapter, fleet vehicles are located at nearly all CDCR State-owned correctional facilities and leased facilities. Fleet parking

Graph 4- Parking Facilities (39 State-Owned and 85 Leased)



locations are determined by the parking layout at each facility. Fleet parking is typically located adjacent to or to the rear of workplace parking and is secured. Employee and public spaces are usually in the same lot, but separately designated through signage. Accessible (i.e., Americans with Disabilities Act compliant) spaces are typically not distinguished between employee and public.

Given the nature of the Department's fleet operations, the length of stay for visiting guests, and number of employees, CDCR has determined it is appropriate that Level 1 chargers should make up approximately 75 percent of chargers in employee parking areas and 25 percent of chargers in fleet parking areas, with the remainder being Level 2. The ratio of Level 1 to Level 2 chargers is based on recommended calculations provided by the Department of General Services.

Based on estimates of future ZEV fleet purchases and a count of workplace parking spaces, it has been determined the Department will need to purchase Level 1 and Level 2 chargers to adequately serve fleet vehicles and achieve the goals established in the ZEV Action Plan.

*Workplace Level 1 (75%) = **1386** *Workplace Level 2 (25%) = **464**

CDCR has determined a need for 11 to 16 electric vehicle chargers based on the projected purchase of 4 to 9 fleet ZEV's for FY 16/17 and the existing ZEVs on-site. The number of additional vehicle charges needed for FY 17/18 and beyond will be based on the locations of the ZEV vehicles, which is yet to be determined. Additionally, CDCR conducted a voluntary statewide Employee Electric Vehicle Charging Survey **(Figure 23)** to further assist in the planning and implementation of electric vehicle infrastructure and charging equipment to meet the 5 percent minimum requirement for workplace charging spaces. The survey was available to all CDCR employees (approximately 56,000) from April 12, 2017 through May 5, 2017.

Figure 22- Employee Electric Vehicle Charging Survey – Question 11 Results

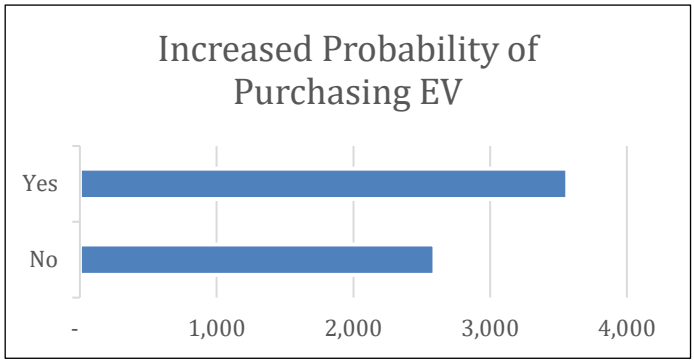


Figure 23- Employee Electric Vehicle Charging Survey Results

CDCR Electric Vehicle Survey Results

Date of Survey May 5, 2017

1.Which facility do you work at?	Results
Total Participants, see results Page 2.	6,352

2. If you drive to work, approximately how far is your trip (one-way)?	Results
Work Travel Distance	
10-25 miles	2,136
26-50 miles	2,119
Less than 10 miles	1,135
More than 50 miles	909
Total	***6,299***

3. Throughout the workday, what is your usual travel pattern?	Results
Travel Pattern	
I leave the worksite and move my vehicle more than once per day	310
I leave the worksite and move my vehicle once per day	570
I stay at worksite and do not move my vehicle	5,411
Total	***6,291***

4. Do you currently participate in ridesharing using vanpooling or carpooling?	Results
Rideshare Y/N	
No	5,350
Yes	949
Total	***6,299***

5. If you do participate in ridesharing, how often do you do this?	Results
Rideshare Frequency	
Everyday	649
Once a week	169
Two-four times a week	387
Total	***1,205***

6. If you do participate in ridesharing, would the installation of designated electric vehicle charging stations affect your participation?	Results
If Rideshare Y = Would EVCS affect Participation?	
No, it wouldn't affect me	2,314
Yes, I will no longer carpool/vanpool	117
Yes, I would reduce my carpool/vanpool participation	115
Total	***2,546***

7. Do you own or are you considering purchasing or leasing an electric or plug-in hybrid electric vehicle?	Results
Staff Considering Purchasing a EV	
No	3,439
Yes, I already own one	383
Yes, I'm considering purchasing but I'm not sure when	1,579
Yes, I'm considering purchasing in 12-24 months	558
Yes, I'm considering purchasing in the next 6 months	348
Total	***6,307***

8. If yes, what type of vehicle are you most interested in?	Results
Electric vehicle (ex. Nissan Leaf, BMW i3, Tesla, etc.)	970
Electric vehicle (ex. Nissan Leaf, BMW i3, Tesla, etc.)	666
Plug-in hybrid electric vehicle (ex. Chevy Volt, Ford C-MAX or Fusion Energi, etc.)	1,335
Total	***2,971***

9. If CDCR installs electric vehicle charging stations at your facility, would you use them?	Results
No	2,445
Yes	3,172
Total	***5,617***

10. If there was a fee for charging, what is the most you would be willing to pay for using of the charging stations?	Results
$0-$2 per charging session	2,361
$2-$4 per charging session	566
More than $4 per charging session	93
N/A because I will not use the charging stations	2,874
Total	***5,894***

11. Would having access to an electric vehicle charging station at your institution/facility increase the probability that you would purchase an electric or plug-in hybrid electric vehicle in the future	Results
No	2,592
Yes	3,564
Total	***6,156***

All questions were not answered completely, so numbers may vary.

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

Table 31- High Priority EVSE Projects

Facility Name	Total* Parking Spaces	Existing L1 Chargers	Existing L2 Chargers	New L1 Chargers Needed - Workplace	New L1 Chargers Needed - Fleet	New L2 Chargers Needed - Workplace	New L2 Chargers Needed - Fleet
SATF	2000	0	0	71	0	24	2
SAC	1111	0	0	39	0	13	1
SOL	893	0	0	31	0	10	1
CIW	490	0	0	18	0	6	1
NCYCC	338	0	0	12	0	4	1
VYCF	272	0	0	10	0	3	1
Total	6389	0	0	360	0	120	7

*Note: Total Parking Space includes total Fleet and Workplace spaces.

CDCR prioritized the facilities in **Table 31** based on existing ZEV fleet inventory, projected electric vehicle purchasing, and results of the employee survey. CDCR's owned ZEVs consist of:

- Four Full Battery Electric Vehicles (BEV, Nissan Leaf)
    - 2 – SATF
    - 1 – SAC
    - 1 – SOL
- Seven Plug-In Hybrid Electric Vehicles (PHEV, Chevrolet Volt)
    - 1 – CIW
    - 1 – NCYCC
    - 1 – VYCF
    - 3 – MCSP*
    - 1 – RJD*

CAC, CHCF, MCSP and RJD currently have ZEV charging stations on-site; these facilities are not included in **Table 31**. CDCR's requirement is projected at 4-to-9 ZEVs for FY 16/17 at the time of this report (locations to be determined).

Outside Funding Sources for EV Infrastructure

CDCR has established a formal partnership with the IOUs to help identify and implement a number of CDCR's sustainability initiatives over the last decade. The CDCR/IOU partnership facilitates ongoing communications on funding opportunities for grants and incentive/rebate programs offered for ZEV infrastructure and charging station equipment. CDCR is researching the IOU programs offered below to determine the program qualifications, additional funding, easement requirements, etc. This is an ongoing process based on availability as the funding opportunities and programs open or close.

Southern California Edison (SCE), Charge Ready Program:

This pilot project will support the installation of as many as 1,500 electric vehicle charging stations. The application process is open at the time of this report. Space requirements include a 10-space minimum. The rebate will cover some or all of the cost of station installation. The

locations in SCE territory must own, operate, or lease a site that provides long dwell time (4+ parked hours). This program is also available in disadvantaged communities (DACs). There is no program participation payment because SCE is only providing rebates, not the purchase of the EVSE itself. This program requires an easement and approval from DGS.

Sacramento Municipal Utility District (SMUD) Workplace Charger Incentive:

This program incentive is for Level 2 (240V) chargers. This application process is open at the time of this report. The rebate is $1,500 per connector, with a maximum of 20 incentives per property. One electric vehicle charger pedestal (dual system) can have two connectors; in this case, the rebate would be $3,000. SMUD also requires the charger(s) to be sub-metered and will monitor the usage associated with the charging, which is then reported to the Air Resources Board (ARB). The ARB generates credits that SMUD sells to fund the rebate program. The sub-meter is installed free by SMUD; however, an electrician/contractor would need to setup the meter "socket" as required so SMUD can follow with the installation of the sub-meter. CDCR is researching the feasibility of utilizing this program for its only owned facility in SMUD territory (i.e., Folsom State Prison) in coordination with an Americans with Disabilities Act Parking Project and Solar Project in progress at this correctional facility.

San Diego Gas & Electric (SDG&E) Power Your Drive:

This is a pilot program to install 3,500 Level 2 EVSEs. The application process is open at the time of this report. Locations must be in SDG&E territory, (RJD is located in San Diego), and DACs are 10 percent of the total funding over the entire program. There is a participation payment of $630/port for workplaces, and $0 for DACs. The EVSE would be owned, operated, and maintained by SDG&E at no cost to the site host. Easements are also required by this IOU. Stations are metered separately from the site host's electric service and account.

Pacific Gas & Electric (PG&E) EV Charge Network:

This is a pilot program to install up to 7,500 Level 2 EVSEs. There is only an interest list at the time of this report. The funding will cover full cost of make-ready installations and a discount of up to 25-100 percent on charging equipment. This program is available in DACs only. Space requirements include a 10-space minimum. Fees include a participation payment and cost of charging stations, though there are subsidized pre-qualified charger packages offered. PG&E requires ownership and the program is allowed only in multifamily or disadvantaged community up to 35%. This program requires an easement and approval by the DGS. CDCR is working with PG&E to identify which of CDCR's 15 facilities located in PG&E territory might be potential candidate sites.

CDCR also participates on the Governor's Office of Business and Economic Development (GO-Biz) Task Force and utilizes a smart sheet application to collaborate with other departments on ZEV infrastructure/charging station funding opportunities. CDCR is working with EVgo for ZEV infrastructure for up to 10 Level 2 charging stations within the IOU territories for make-ready installation of up to $30,000. The scope of work includes electrical subpanel, transformer, conduit, wiring, concrete pad, and pedestal or wall receptacle. Site assessments, cost development and design are in process at 23 of CDCR's State-owned facilities

for this potential “free” infrastructure (not including the scope of work and costs to install the EV charging station equipment and on-going maintenance).

Hydrogen Fueling Infrastructure

CDCR participates in the GO-Biz Task Force and is working with the U.S. Department of Energy to track new technologies for ZEVs, including the purchase of hydrogen vehicles and fueling infrastructure. Currently there are 28 open retail hydrogen fueling station locations statewide and only 1 hydrogen vehicle available in the DGS State Contract. Given CDCR’s unique, widespread operations, often in remote areas, having more stations and more vehicle choices offered through DGS would help CDCR expand the number of these types of vehicles in its fleet.

Comprehensive Facility Site and Infrastructure Assessments

Site assessments are performed to establish the cost and feasibility of installing the needed electric vehicle infrastructure. **Table 31** lists the facilities that have been evaluated with Site Assessments.

CDCR has compiled detailed site assessment surveys for the adult and juvenile correctional facilities identified in **Figure 24**. The remaining site assessment surveys are in process. Site assessment surveys were distributed statewide to collect existing information, including parking layout, electrical, photos, maps, and proposed electric vehicle charging station locations. These site assessment surveys were provided to EVgo for the correctional facilities within the IOU territories to assist in cost development, planning, design, and construction for “free” infrastructure for up to 10 Level 2 electric vehicle charging stations. CDCR is utilizing the site assessments to develop cost estimates, feasibility, and planning for incorporating ZEVs into the fleet and for meeting the minimum requirements for 5 percent workplace charging spaces.

Figure 24- Preliminary Site Assessments

Figure 25- Preliminary Site Assessment Survey (Example)

Avenal State Prison

1 Kings Way, Avenal, CA 93204

1. Parking Type (check all that apply): ☐ Garden ☒ Lot ☐ Structure
2. Description of the electric room location: Located N/E corner of bldg. 830, see pics. Has own exterior door. No meter.
3. Volts and amps to the electrical panel: ☒ 208 volt | 125 amp ☐ 208 volt | 225 amp ☐ 480 volt | 60 amp ☒ 480 volt | 110 amp
4. PHOTO: Electrical Panel and Plate
5. PHOTO: Meter Box NONE
6. Sub panel? If yes, amps and volts: ☒ 208 volt | 125 amp ☒ 208 volt | 225 amp ☐ 480 volt | 60 amp ☐ 480 volt | 110 amp
7. PHOTO: Sub-Panel (if applicable)
8. PHOTOS: Parking Lot and Stalls
9. Description of the location of the make-ready parking spaces: **Visitor parking lot, first six stalls. Diagonal parking. Stations to be protected by bollards**
10. MAP: Indicate on the map above the exact locations of all of the make-ready parking spaces
11. Trenching needed? If yes, max distance and type: **☒ Asphalt ☐ Concrete ☒ Landscape**
12. Wall penetrations? If yes, how many: 1
13. MAP: Indicate on the map above the location of the power source
Additional Notes **All materials have already been purchased for 6 stations. See attachments/drawings for more specifics.**

Table 32- Analysis 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
ASP	0	0	In progress	0	TBD
CMC	0	0	In progress	0	TBD
SQ	0	0	In progress	0	TBD
CCI	0	0	In progress	0	TBD
CIW	0	0	In progress	0	TBD
LAC	0	2	In progress	0	TBD
CVSP	0	0	In progress	0	TBD
ISP	0	0	In progress	0	TBD
KVSP	0	0	In progress	0	TBD
NKSP	0	0	In progress	0	TBD
VYCF	0	0	In progress	0	TBD
RJD	0	10	In progress	0	TBD
SOL	0	0	In progress	0	TBD
Total	0	12	In progress	0	TBD

The cost development and analysis of the site assessments are in progress. DGS determined that golf-cart charging is not considered Level 1, and as a result, CDCR removed these calculations from the Five Year ZEV Infrastructure Readiness Survey. Based on this determination, CDCR has no Level 1 chargers at its adult and juvenile correctional facilities. A description of CDCR's Level 2 chargers is provided in the next section of this Roadmap. CDCR is working with EVgo on completing site assessments, cost development, planning, design and construction for the electric vehicle infrastructure for the 23 facilities located in IOU territories. CDCR continues to explore utility programs and other funding alternatives to meet ZEV fleet and workplace charging requirements.

Electric Vehicle Supply Equipment Construction Plan

Over the past five years, CDCR has successfully integrated the installation of ZEV infrastructure and charging stations into new construction and renovation projects when feasible.

California Health Care Facility (CHCF) – During the construction of this facility, three Level 2 dual port charging stations were installed to support workplace charging (activated 2014).

Figure 26- Workplace Electric Vehicle Charging – CHCF

California State Prison, Lancaster (LAC) – During the construction of the Enhanced Outpatient Program Office and Treatment building, one Level 2 dual-port charging station was installed to support workplace charging (activated 2014).

Figure 27- Workplace Electric Vehicle Charging – LAC

Mule Creek State Prison (MCSP) – During the infill project at this site, two Level 2 dual port charging stations and two Level 2 single port charging stations were installed to support workplace charging (activated 2016).

Figure 28- Workplace Electric Vehicle Charging – MCSP

Richard J. Donovan Correctional Facility (RJD) – During the infill project at this site, five Level 2 dual-port charging stations were installed to support workplace and fleet charging (activated 2017).

Figure 29- Workplace Electric Vehicle Charging – RJD

California City Correctional Facility (CAC) – During the renovation of this lease facility, two Level 2 dual-port charging stations were installed to support workplace charging (activated 2017).

Figure 30- Workplace Electric Vehicle Charging – CAC

As well as incorporating these efforts into new construction projects when feasible, CDCR continues to seek and explore opportunities offered by the IOUs, city and county offices, and local nonprofits to fund electric vehicle infrastructure and charging equipment. To date, the programs offered by the utilities have only covered minimal costs. CDCR has also encountered security challenges in meeting easement requirements. In October 2017, CDCR was notified by DGS that one or more of CDCR's facilities had been identified as a candidate(s) for Phase 1 of the FY 17/18 Electric Vehicle Charging Infrastructure Program. This program is funded through a DGS Budget Change Proposal to support electric vehicle infrastructure projects. CDCR submitted a request to DGS to pursue this opportunity. CDCR may also request additional funding for ZEV infrastructure and charging station equipment through the State budget process.

Electric Vehicle Supply Equipment Operation

There are several divisions within CDCR with overlapping roles and responsibilities for the installation of ZEV infrastructure, installation, and operation of charging station equipment and ZEV purchasing such as the Energy and Sustainability Section, Office of Business Services, and statewide correctional facilities. CDCR is working with DGS on evaluating ZEV parking policies and pricing options. CDCR is planning to develop statewide standardized policies and procedures for operating electric vehicle charging stations, fee-based or no fees, maintenance of equipment, reporting/tracking usage data, etc. This may be accomplished through the establishment of a task force consisting of representatives from the CDCR divisions/branches designated with interrelated areas of responsibility.

CHAPTER FIVE

WATER EFFICIENCY & CONSERVATION

CHAPTER 5: WATER EFFICIENCY & CONSERVATION OVERVIEW

CDCR's construction program has aimed to improve efficiency of key water systems in the last 10 years, or more, through its CALGREEN and LEED efforts and has furthered the goals of water conservation through changes in operational practices. Some of its water efficiency projects have included the installation of water efficiency fixtures and plumbing controls, as well as commercial grade equipment. Many of these projects predate any requirements established by recent executive orders. One of the most significant water savings achieved by CDCR, for example, was through its installation of devices installed on inmate toilets, starting in 2006, which regulate the amount of flushes in a specified time frame. These devices, on average, resulted in water savings of 40 percent or more at prisons statewide. More recent water conservation efforts have included changes to operational procedures to further reduce water consumption as required through CDCR's implementation of Drought Action Plans.

CDCR will continue to investigate opportunities that will make the water savings permanent; however, CDCR has challenges that make project development complex. A recent facility condition assessment (of aging infrastructure) conducted by a third party has identified a backlog of infrastructure repairs and replacements at a cost of over $10 billion. Where possible, CDCR pairs an infrastructure repair or replacement project with a water efficiency opportunity to address both critical needs. Another challenge is the availability of financing or grants for water efficiency projects for CDCR facilities. CDCR has applied for and received grants; however, this funding is limited when compared to the potential opportunities for water efficiency projects throughout the Department.

OUR ANNUAL WATER SAVINGS
4+ billion-gallon reduction from 2003
7,182 Olympic-size swimming pools

Through the efforts implemented thus far, CDCR has reduced the amount of water usage by 45 percent since 2003, a decrease of over 5.1 billion gallons of water. EO B-18-12 requires State Agencies to reduce agency-wide water use 10 percent by 2015 and 20 percent by 2020 as measured against a 2010 baseline. Through 2016, CDCR has exceeded the target by an additional 9 percent. For EO B-29-15, CDCR has exceeded the State Water Resources Control Board (SWRCB) statewide target to reduce potable water use by 25 percent by saving 28 percent between 2013 through February 2016.

Through the continued efforts of CDCR's current and ongoing programs, projects, and objectives, CDCR is on track to meet or exceed the overall GHGe, energy, water, and renewables goals and objectives set forth by the Administration and its own ambitious sustainability agenda, including being a leader in advancing and meeting the goals and objectives of EOs B-18-12 and B-29-15.

I. WATER EFFICIENCY & CONSERVATION GOALS

The Governor has issued numerous executive orders directing sustainable State operations. The orders and related policy guidelines implementing those orders relevant to water efficiency and conservation are:

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 GHGe, 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 staffs level Sustainability Working Group and the executive level Sustainability Task Force, to ensure these measures are met.

EO B-18-12 requires State Agencies to reduce agency-wide water use 10 percent by 2015 and 20 percent by 2020, as measured against a 2010 baseline. The 2015 and 2020 targets reinforce the SB X7-7 requirement that State Agencies reduce water use at facilities they operate to support local water suppliers in meeting their targets.

On February 28, 2013, the California Department of Water Resources issued its Water Use Reduction Guidelines and Criteria, pursuant to EO 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 facilities owned, funded or leased. 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 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.

All the following sections in this water plan and the associated worksheet only repeat the initial criteria and guidelines issued. Only the Model Water Efficient Landscape Ordinance (MWELO) requirements have been updated. Additionally, other executive orders have followed, strengthening and elaborating on the issues contained in EO B-18-12.

Beginning January 2013, EO B-18-12 required Agencies to regularly report current water use into the water tracking database. Since January 2014, annual water use reports have documented progress towards the 2015 and 2020 targets using the ESPM Database to track energy and water use and to submit annual reports to DGS. Additionally, for facilities with landscape areas over 20,000 sq. ft., landscape water use must be tracked with a water budget program.

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. The Governor directed numerous State Agencies to develop new programs and regulations to mitigate the effects of the drought and required increased enforcement of water waste

state-wide. Agencies were instructed to reduce potable urban water use by 25 percent through February 2016 when compared to 2013.

Executive Order B-30-15

EO B-30-15 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 GHGe reduction target of 40 percent below 1990 levels by 2030, and reaffirms California's intent to reduce GHGe by 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous State Agencies to develop plans and programs to reduce emissions.

Executive Order B-37-16

EO B-37-16 builds on what were formerly temporary statewide emergency water restrictions in order to establish longer-term water conservation measures. It includes 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 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 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 sections of the *State Administrative Manual (SAM)* and associated MM currently impose sustainability requirements including those specifically for water in departments under the Governor's executive authority:

SAM Sections

- Landscaping practices 1821.5 - State building and facility managers will adopt the following landscaping practices:
    - Reduce landfill waste material and water use
    - Promote the purchase of sustainable plants and maintenance materials
    - Maintain a healthier outdoor environment
- Drought moratorium 1821.4 - The Emergency Drought Proclamation dated January 17, 2014, places a moratorium on new, non-essential landscaping projects at State facilities and on State highways and roads. Projects that are not needed to protect existing trees and shrubs or are not necessary for erosion or dust control are considered non-essential.

Relevant Management Memos

- MM 15-06: State Buildings and Grounds Maintenance and Operation - This MM provides State building and facility managers with practices and procedures to achieve operational efficiencies and resource conservation measures for: Integrated Pest Management (IPM), Drought Moratorium, Landscaping Practices, and Maintenance of Building Exteriors, Roofs, Hardscape, and Exterior Painting.
- MM 14-02: Water Efficiency and Conservation - This MM provides direction to all State Agencies under the Governor's executive authority on meeting the water use reduction requirements outlined in EO B-18-12. In addition, State Agencies should prepare for the possibility that additional conservation measures could be required in 2014 to address the anticipated statewide drought conditions.
- MM 14-07: Standard Operating Procedures for Energy Management in State Buildings - This MM amends the Standard Operating Efficiency Procedures regarding efficient energy management in State buildings during normal operations, as specified in EO B-18-12 and the *Green Building Action Plan*.

Relevant Legislation

Sustainable Groundwater Management Act of 2014 - The Sustainable Groundwater Management Act (SGMA) directs the DWR to identify groundwater basins and sub-basins in conditions of critical overdraft. Conditions of critical overdraft result from undesirable impacts, which can include seawater intrusion, land subsidence, groundwater depletion, and/or chronic lowering of groundwater levels. As defined in the SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."

As required in the SGMA, basins designated as high or medium priority *and* critically over drafted shall be managed under a Groundwater Sustainability Plan or coordinated groundwater sustainability plans by January 31, 2020. All other high and medium priority basins shall be managed under a groundwater sustainability plan by January 31, 2022.

Senate Bill X7-7, also known as The Water Conservation Act of 2009, specifies urban water consumption reduction requirements.

II. WATER EFFICIENCY & CONSERVATION REPORT

This Water Efficiency and Conservation Report demonstrates to the Governor and the public the progress the Department has made toward meeting the Governor's goals. This report identifies successful accomplishments, ongoing efforts, and outstanding challenges.

Introduction

California experiences the most extreme variability in yearly precipitation in the nation. In 2015, California had record low statewide mountain snowpack of only 5 percent of average, while 2012 - 2014 were the four driest consecutive years of statewide precipitation in historical record. Since then, the 2017 water year (October 1, 2016 - September 30, 2017) has surpassed the wettest year of record (1982 - 1983) in the Sacramento River and San Joaquin River

watersheds and was close to becoming the wettest year in the Tulare Basin (set in 1968 - 1969). These potential wide swings in precipitation from one year to the next show why California must be prepared for either flood or drought in any year, therefore, using water wisely is critical.

The EO and *SAM* sections listed in the previous section help demonstrate the connection between water and energy use (the water-energy nexus), water and climate change, and water and landscaping. Further, the impact of water uses by State Agencies goes beyond the scope of these EOs, *SAM* sections, and DGS MM because these documents do not address related 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. However, by using holistic water planning, a well-crafted water plan can not only meet all State requirements but add considerable value and benefits to the organization and surrounding communities.

CDCR Mission and Built Infrastructure

The CDCR mission is to improve public safety through law enforcement that provides for the safe and secure incarceration of the State's most serious and violent felons, and to provide parole supervision and develop and implement rehabilitative strategies to successfully reintegrate offenders back into their communities.

CDCR's building portfolio, on average, is nearly 50 years old, with its two oldest facilities being more than 100 years old. A large majority of CDCR's facilities are in need of substantial repairs or upgrades to maintain their usability.

CDCR employs over 56,000 persons and maintains infrastructure for 34 State-owned adult institutions, 3 juvenile facilities, 6 facilities in "warm shut down" (minimal operations/no inmates) and a training academy housing cadets. Its facilities include over 49 million square feet of State-owned building space on over 24,000 acres of land statewide. The footprint per facility ranges from 82,000 to over 3.3 million square feet.

The CDCR-owned facilities are composed of inmate housing living units, kitchens, dining, vocational, education, factories, laundry, medical, dental, administration buildings, and other process-oriented systems such as Waste and/or Water Treatment Plants and Central Plants. Unlike more typical commercial building settings, CDCR's water needs are often served through its own on-site wells, reservoirs and/or water treatment plants.

CDCR's total water usage has been declining steadily since the baseline year of 2003. See **Table 33** on the following page for actual usage.

Table 33- Historical Annual Water Usage

Year	Gallons	Water Savings compared to 2003 Gallons	Water Savings compared to 2003 %
2003	11,386,443,127		
2010	8,792,331,651	2,594,111,476	23%
2013	8,452,234,392	2,934,208,735	26%
2014	7,121,071,080	4,265,372,048	37%
2015	6,287,053,223	5,099,389,904	45%
2016	6,220,281,222	5,166,161,905	45%

CDCR currently does not track the costs associated with the purchase of water, as not all institutions purchase water. Several institutions pump water from wells and treat it on-site or create potable water. The institutions with the largest per capita water use are shown in **Table 34**.

Table 34- Properties with Largest Water Use Per Capita in 2016

Building Name	Area (ft^2)	Total Gallons	Gallons per Capita*
California Institution for Men	1,748,957	329,659,200	171
California State Prison, Corcoran	1,652,194	345,389,000	169
Folsom State Prison	1,008,640	172,829,500	137
Deuel Vocational Institution	1,202,847	159,246,000	135
California State Prison, Sacramento	1,324,762	174,329,500	114
Total for Buildings in This Table	6,937,400	1,181,453,200	---
Total for All Department Buildings	49,091,627	6,202,415,100	---
% of Totals	14 %	19 %	---

*Includes inmates and staff

CDCR's largest landscape areas, including turf and landscaping, are shown in **Table 35** on the following page.

Table 35- Properties with Largest Landscape Area

Institution	Area (ft^2)
Mule Creek State Prison	3,475,090
Pleasant Valley State Prison	3,013,145
San Quentin State Prison	2,580,391
California Institution for Men	1,895,526
California Medical Facility	1,780,548
Total for Institutions in This Table	12,744,000
Total for All Institutions	36,682,490
% of Totals	35 %

CDCR's challenges in meeting the Administration's water conservation goals:

- 24-hour operations – Unlike typical office environments that have core days/hours of operation, CDCR operates on a 7 day, 24-hour basis. Water usage is continuous given the fact that CDCR building infrastructure includes housing units for inmates and the staff necessary to maintain 24-hour operations.
- Unique utility drivers – The size of CDCR institutions has created a need to function independently of typical city- or county-provided services. Unlike typical office building environments, CDCR operates many water and wastewater plants serving its facilities. Some plants even serve the surrounding properties, both public and private. The sheer size of many of these systems are often expensive to replace with higher efficiency systems, leading to increased costs of operation until sufficient funding is identified.
- Aging infrastructure – CDCR is not sufficiently funded to address its aging infrastructure. Recent facility condition assessments conducted by a third party have identified a backlog of infrastructure repairs and replacements at more than $10 billion. The backlog of deferred projects is increasing each year, and efficiency projects are competing against those needs. Where possible, CDCR pairs a needed infrastructure repair or replacement with a water efficiency opportunity to address both areas.
- Limited Operations and Maintenance budget – Each facility's operation and maintenance budget is based on the number of inmates housed, regardless of building square footage. The budget is based upon a set amount of $277 per inmate, per year. That total is divvied up between 34 State-owned institutions for their respective annual maintenance allowance. This can impact each facility's ability to service its equipment as needed in order to maintain maximum efficiency.
- Financing/Grants – CDCR requires additional funds, beyond the insufficient facility operations funds that are currently provided, in order to implement more water efficiency projects that will permanently reduce water usage; however, there are limited grant opportunities currently available for State government agencies like CDCR. CDCR

was, however, successful in obtaining a grant from the Department of General Services (DGS) that allowed for many improvements in a few key facilities. CDCR will continue to take advantage of any further opportunities as they become available.

As shown in **Table 36** below, the water usage reductions have resulted in lower per-capita usage as well.

Table 36- Department-wide Water Use Trends - Baseline Years 2010, 2013, and 2016

Year	Total Occupancy/year	Total Amount Used (Gallons/year)	Per capita Gallons per person per day
2010	202,530	8,792,331,651	119
2013	173,769	8,452,234,392	100
2016	168,808	6,202,415,100	101

CDCR has achieved both the 20 percent reduction goal from the 2010 baseline required by EO B-18-12 and the 25 percent reduction goal from the 2013 baseline required by EO B-29-15. As CDCR's square footage continues to increase, the Department plans to continue water conservation efforts.

Table 37- Total Water Reductions Achieved in 2016 Compared to Baseline Years

Total Water Use Compared to Baseline Years	Reduction Achieved	Percentage Reduction Achieved
EO B-18-12 2010 Baseline: 20% Reduction Achieved	☒ Yes ☐ No	29% reduction
EO B-29-15 2013 Baseline: 25% Reduction Achieved	☐ Yes ☒ No	26% reduction

CDCR was a diligent conserver of water even before it was popular or mandated. From 2006 through 2008, the Department installed over 45,800 flushometers **(Figure 34)** on inmate cell toilets across the State. These efforts yielded total water consumption reductions averaging 40 percent at each institution where they were installed. Flushometers are devices that limit the number of times toilets may be flushed in a predefined time period. Prior to their installation, inmates used toilets for non-hygiene purposes, including signaling, contraband disposal, and other disruptive behavior.

Figure 31- Flushometers at CMF

A comparison of three institutions (Centinela State Prison, Ironwood State Prison, and Pleasant Valley State Prison) that were reasonably similar in the number of cells converted to flushometer use provides a good basis for comparison of water consumption and wastewater flow reductions from July 2006 through March 2008 with the population trends at each facility.

- Centinela State Prison: 2,080 cells converted - The flushometer installation started in March 2007 and was completed in November 2007. The wastewater flow prior to installation averaged roughly 30 million gallons a month. The average wastewater flow after installation was approximately 21 million gallons. The water consumption at this facility also shows a similar trend with a reduction of approximately 30 percent.
- Ironwood State Prison: 2,000 cells converted - The flushometer installation started in September of 2007 and completed in 2008 The wastewater flow at this facility prior to installation averaged roughly 45 million gallons a month. At 80 percent installation, the average wastewater flow for Ironwood State Prison reduced to approximately 25 million gallons, a reduction of almost 45 percent.
- Pleasant Valley State Prison: 2,100 cells converted - The flushometer installation started in July 2007 and was completed in February 2008. The wastewater flow prior to installation averaged approximately 3 million gallons a month. This was reduced to almost 15 million gallons by February 2008. The water consumption prior to installation averaged roughly 32 million gallons a month and decreased to almost 16 million gallons after installation. The water consumption and wastewater flow each had a reduction of approximately 50 percent.

Despite the challenges previously discussed, CDCR has been successful in obtaining grants through DGS and has found program savings to complete water efficiency projects. Between 2014 and 2017, CDCR completed water conservation projects at 33 institutions for a total annual water savings of over 150 million gallons. Most of these projects replaced toilets, faucets and showerheads, but some included new high efficiency scullery equipment like the new dishwasher at Avenal State Prison **(Figure 32)**.

Figure 32- New Dishwasher at ASP

CDCR institutions utilize boilers for hot water and steam production. Through the Investor-Owned Utility (IOU) partnership, various loans, and utilizing the Energy Service Company (ESCO) pool, CDCR has completed many energy efficiency projects that also realized substantial water savings. **Table 38** details projects at various institutions.

Table 38- Summary of Boilers and Cooling Systems Projects Completed or In Progress

Year Funded	Institution	Project	Status
2009	PVSP	Water Treatment Plant Upgrades	Complete
2009	SVSP	Condenser Coil Replacements	Complete
2010	CCI	Point of Use Boilers (removed two housing units from central plant)	Complete
2011	CIM	Replaced PIA Boiler with High Efficiency Model	Complete
2011	COR	Replaced Hot Water Heaters	Complete
2011	CRC	Replaced Boilers with High Efficiency Models	Complete
2011	NKSP	Installed Instantaneous Water Heaters	Complete
2012	CTF	Replaced Boilers with High Efficiency Models	Installed
2014	WSP	Replaced Boilers with High Efficiency Models	Complete
2015	CIM	Reservoir Renovation and Leak Repair	Complete
2016	PBSP	Hydronic Loop Replacement	Complete
2016	ASP	Replace Steam and Condensate loop	In Construction
2016	MCSP	Replace Hydronic Loop	In Construction
2017	ASP	Hydronic Loop Replacement	In Construction
2017	SAC	Replace Underground Steam and Condensate Return	Complete
2017	DVI	New Boiler	In Design
2017	SQ	New Boiler	In Design
N/A	CCI	Replace Steam and Condensate Return	Planned, Unfunded
N/A	CIW	Repair Hydronic Piping Loop	Planned, unfunded
N/A	CMC	Repair Steam and Condensate Return	Planned, Unfunded
N/A	COR	Replace Hot Water and Hydronic Loop	Planned, Unfunded
N/A	SOL	Replace Hydronic Loop	Planned, Unfunded
N/A	SQ	Repair Steam and Condensate Return	Planned, Unfunded

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 B-37-16 requires DWR to propose strengthened 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 proposes to work with counties to facilitate improved drought planning.

DWR has released the public draft of these proposed requirements, found here: Making Water Conservation a California Way of Life.

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

The Sustainable Groundwater Management Act (SGMA) established a new structure for managing California's groundwater resources at a local level by local agencies. SGMA required, by June 30, 2017, the formation of locally controlled groundwater sustainability agencies (GSAs) in the State's high- and medium-priority groundwater basins and sub-basins (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.

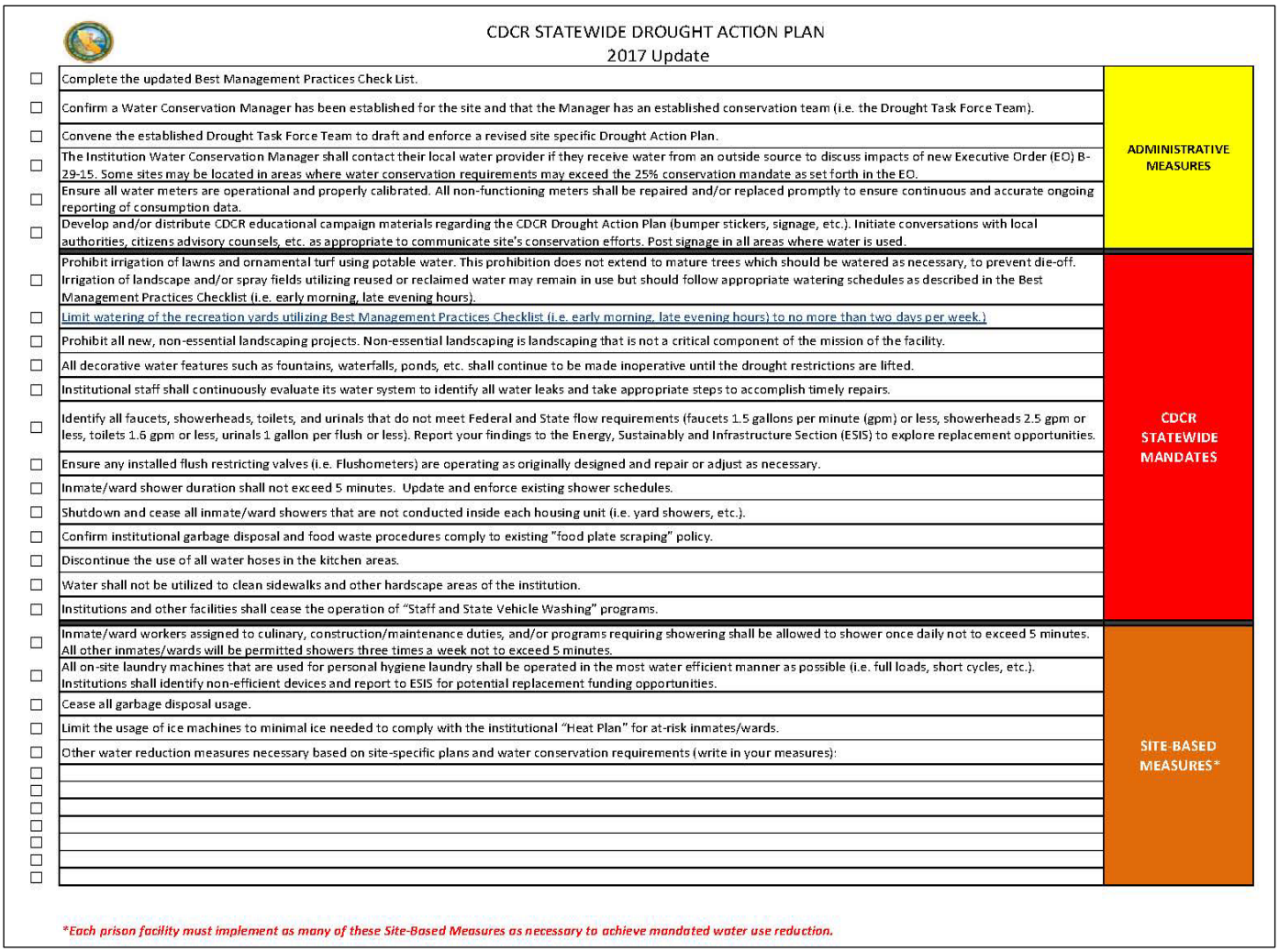
CDCR reacted immediately to all Executive directives during the recent drought and has continued to maintain water conservation directives. CDCR developed a statewide Drought Action Plan and required each institution to develop a site-specific plan as well. Each institution selected a Water Conservation Manager (WCM) to lead Drought Task Force Teams. Each WCM worked closely with their water suppliers and with DWR to ensure coordination, especially at institutions located in critical groundwater basins. The WCMs also worked with CDCR's FPCM to ensure water shortage contingency plans were in place.

Table 39- Institutions with Urban Water Shortage Contingency Plans and in Critical Groundwater Basins

Number of Institutions with urban water shortage contingency plans.	45
Number of Institutions in critical groundwater basins	12
Total Amount of water used by buildings in critical groundwater basins (Gallons)	1,369,931,800

The original Drought Action Plan from 2013 is still enforced with one exception, to allow for limited irrigation of the institution's recreational yards. **Figure 33** shows the 2017 Updated Drought Action Plan.

Figure 33- 2017 CDCR Statewide Drought Action Plan



CDCR STATEWIDE DROUGHT ACTION PLAN
2017 Update

☐	Complete the updated Best Management Practices Check List.	ADMINISTRATIVE MEASURES
☐	Confirm a Water Conservation Manager has been established for the site and that the Manager has an established conservation team (i.e. the Drought Task Force Team).	
☐	Convene the established Drought Task Force Team to draft and enforce a revised site specific Drought Action Plan.	
☐	The Institution Water Conservation Manager shall contact their local water provider if they receive water from an outside source to discuss impacts of new Executive Order (EO) B-29-15. Some sites may be located in areas where water conservation requirements may exceed the 25% conservation mandate as set forth in the EO.	
☐	Ensure all water meters are operational and properly calibrated. All non-functioning meters shall be repaired and/or replaced promptly to ensure continuous and accurate ongoing reporting of consumption data.	
☐	Develop and/or distribute CDCR educational campaign materials regarding the CDCR Drought Action Plan (bumper stickers, signage, etc.). Initiate conversations with local authorities, citizens advisory counsels, etc. as appropriate to communicate site's conservation efforts. Post signage in all areas where water is used.	
☐	Prohibit irrigation of lawns and ornamental turf using potable water. This prohibition does not extend to mature trees which should be watered as necessary, to prevent die-off. Irrigation of landscape and/or spray fields utilizing reused or reclaimed water may remain in use but should follow appropriate watering schedules as described in the Best Management Practices Checklist (i.e. early morning, late evening hours).	CDCR STATEWIDE MANDATES
☐	Limit watering of the recreation yards utilizing Best Management Practices Checklist (i.e. early morning, late evening hours) to no more than two days per week.)	
☐	Prohibit all new, non-essential landscaping projects. Non-essential landscaping is landscaping that is not a critical component of the mission of the facility.	
☐	All decorative water features such as fountains, waterfalls, ponds, etc. shall continue to be made inoperative until the drought restrictions are lifted.	
☐	Institutional staff shall continuously evaluate its water system to identify all water leaks and take appropriate steps to accomplish timely repairs.	
☐	Identify all faucets, showerheads, toilets, and urinals that do not meet Federal and State flow requirements (faucets 1.5 gallons per minute (gpm) or less, showerheads 2.5 gpm or less, toilets 1.6 gpm or less, urinals 1 gallon per flush or less). Report your findings to the Energy, Sustainably and Infrastructure Section (ESIS) to explore replacement opportunities.	
☐	Ensure any installed flush restricting valves (i.e. Flushometers) are operating as originally designed and repair or adjust as necessary.	
☐	Inmate/ward shower duration shall not exceed 5 minutes. Update and enforce existing shower schedules.	
☐	Shutdown and cease all inmate/ward showers that are not conducted inside each housing unit (i.e. yard showers, etc.).	
☐	Confirm institutional garbage disposal and food waste procedures comply to existing "food plate scraping" policy.	
☐	Discontinue the use of all water hoses in the kitchen areas.	
☐	Water shall not be utilized to clean sidewalks and other hardscape areas of the institution.	
☐	Institutions and other facilities shall cease the operation of "Staff and State Vehicle Washing" programs.	
☐	Inmate/ward workers assigned to culinary, construction/maintenance duties, and/or programs requiring showering shall be allowed to shower once daily not to exceed 5 minutes. All other inmates/wards will be permitted showers three times a week not to exceed 5 minutes.	SITE-BASED MEASURES*
☐	All on-site laundry machines that are used for personal hygiene laundry shall be operated in the most water efficient manner as possible (i.e. full loads, short cycles, etc.). Institutions shall identify non-efficient devices and report to ESIS for potential replacement funding opportunities.	
☐	Cease all garbage disposal usage.	
☐	Limit the usage of ice machines to minimal ice needed to comply with the institutional "Heat Plan" for at-risk inmates/wards.	
☐	Other water reduction measures necessary based on site-specific plans and water conservation requirements (write in your measures):	
☐		
☐		
☐		
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☐		
☐		
☐		

Each prison facility must implement as many of these Site-Based Measures as necessary to achieve mandated water use reduction.

CDCR's Energy and Sustainability Section (ESS) reviews water conservation exemption requests submitted by the institutions. Past water usage data is analyzed and compared with proposed usage. A determination is made whether to approve or deny the specific water exemption request. If approval is granted, the institution's Site Specific Drought Plan and Best Management Practices Checklist will be modified accordingly.

Building Inventories Summary

Since 2015, CDCR has completed major water retrofits for most of its institutions. CDCR has spent over $6 million in equipment purchases to retrofit toilets, faucets, urinals, and shower heads as illustrated in **Table 40**. The initial walk-through of each institution provided information that was used to make the purchase for each site. While 95 percent of the projects have been completed, the remaining projects should be completed by June 2018. CDCR is currently working with the San Diego County Water Authority to receive a grant to complete the toilet retrofits for the Richard J. Donovan Correctional Facility (RJD) in San Diego. **Table 41** summarizes the total building inventories less the parts previously replaced to provide a replacement schedule.

Table 40- Summary of Indoor Water Efficiency Projects Completed or In Progress

Efficiency Project Name	Facility	Year Begun	Completion Date (or Estimate)	Status	Est. Annual Water Savings (Gallons)
Grant - Dishwashers	ASP	2015	6/30/2017	Complete	5,683,780
Faucets	ASP	2015	3/30/2017	Complete	819,060
Grant - Toilets, Faucets	CAL	2015	6/30/2017	Complete	3,780,086
Toilets, Faucets, Showerheads	CAL	2015	5/30/2016	Complete	131,400
Toilets, Faucets, Showerheads	CCC	2015	6/30/2018	75%	6,861,416
Toilets, Faucets, Showerheads	CCI	2015	6/30/2018	53%	397,120
Toilets, Showerheads	CCWF	2015	12/1/2016	Complete	5,485,220
Showerheads	CEN	2015	7/1/2016	Complete	536,550
Toilets, Showerheads	CIM	2015	12/30/2016	Complete	1,642,500
Grant - Toilets/Sink Combo Units	CIW	2015	4/30/2017	Complete	32,794,900
Grant - Urinals	CMC	2015	6/30/2018	9%	3,723,000
Toilets, Showerheads	CMC	2015	5/30/2016	Complete	1,795,800
Faucets, Showerheads	CMF	2015	12/30/2016	Complete	136,875
Toilets, Showerheads	COR	2015	6/30/2018	95%	1,988,520
Toilets, Faucets, Showerheads	CRC	2015	6/30/2018	97%	1,760,760
Faucets, Showerheads	CTC	2015	12/30/2016	Complete	328,500
Showerheads	CVSP	2015	6/30/2016	Complete	821,250
Toilets, Faucets	DVI	2015	6/30/2018	80%	199,509
Grant - Faucets	FSP	2015	6/30/2018	75%	7,227,000
Toilets, Faucets, Showerheads	FSP	2015	12/30/2016	Complete	2,764,328
Toilets, Faucets, Showerheads	HDSP	2015	12/31/2017	99%	901,696
Toilets, Faucets, Showerheads	ISP	2015	5/15/2016	Complete	328,700
Faucets, Showerheads	KVSP	2015	6/30/2018	85%	2,072,835
Toilets, Showerheads	LAC	2015	6/30/2016	Complete	1,226,400
Toilets, Faucets	MCSP	2015	6/30/2016	Complete	616,850
Showerheads	NKSP	2015	12/31/2016	Complete	109,500
Toilets, Faucets, Showerheads	PBSP	2015	6/30/2018	67%	8,647,215
Toilets	PVSP	2015	10/31/2016	Complete	23,579
Grant - Toilets, Faucets	RJD	2015	6/30/2017	Complete	41,007,487
Grant - Toilets, Faucets, Showerheads	SAC	2015	6/30/2018	64%	1,870,829
Toilets, Faucets, Showerheads	SCC	2015	6/30/2017	Complete	1,057,040
Toilets, Faucets, Showerheads	SOL	2015	10/31/2016	Complete	2,711,585
Toilets	SQ	2015	6/30/2017	Complete	1,102,008
Faucets, Showerheads	SVSP	2015	6/30/2018	40%	3,832,500
Toilets, Faucets, Showerheads	VSP	2015	6/30/2016	Complete	1,004,480
Toilets, Faucets, Showerheads	VYCF	2015	6/30/2016	Complete	1,213,698
Toilets, Faucets, Showerheads	WSP	2015	1/31/2017	Complete	1,971,000
Totals					**148,574,976**

Figure 34- Original Toilet and Sink at CIW

Figure 35- Retrofitted Toilet/Sink Combo at CIW

Table 41- Summary of Department Inventory Needs

Item	Original Inventory	Previously retrofitted	Replacement Need
Number of toilets to be replaced with 1.25 gallon per flush	30,868	4,207	26,661
Number of faucets to be replaced	56,128	7,449	48,679
Number of toilet/sink combo units to be replaced	29,168	943	28,225
Number of showerheads to be replaced at 2.0 gpm	25,030	3,746	21,284

Heating and Cooling Systems Inventories Summary

CDCR has an extensive system of boilers and other HVAC systems throughout its institutions. Refer to **Table 38** for a list of previously completed and planned projects.

Table 42- Summary of Boilers and Cooling Systems Inventory

Amount of water used for make-up (Gallons)	2,992,862
Number of flash tanks to purchase and install	6
Number of meters to purchase and install	24
Amount currently reused (Gallons)	144,877
Remaining additional water suitable for other purposes such as irrigation (Gallons)	21,444,000

Irrigation Hardware Inventories Summary

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

CDCR has not specifically developed landscaping water budgets for its facilities due to the limitations in place to restrict landscape watering. However, if all water restrictions were lifted, **Table 43** below summarizes what irrigation hardware would be needed for all institutions.

Table 43- Summary of Irrigation Hardware Inventory

Number of separate meters or sub-meters to purchase and install	204
Number of irrigation controllers required with weather or soil moisture adjustment and flow sensing capabilities to purchase and install	775
Number of backflow prevention devices to purchase and install	213
Number of flow sensors to purchase and install	213
Number of new pressure regulators to purchase and install	1,270
Number of new hydro zones needed	978
Number of new valves to purchase and install	995
Number of filter assemblies to purchase and install	211
Amount of drip irrigation to purchase and install (area covered)	57,228,357

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. Furthermore, landscaping in public places frequently surrounds historic places and public memorials as well as providing 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, water and energy efficiency, and water conservation. Urban forests are vital to improve site conditions for occupants and visitors to buildings and the surrounding communities. Large shade trees should be considered valuable infrastructure and given priority over other plants to maintain tree health. A voluntary urban forest plan is encouraged to assess individual trees and plan for additional tree plantings.

During the design and construction of the California Health Care Facility (CHCF), CDCR incorporated landscape elements (bioswales) to remove silt and pollution from surface runoff water. In another of its facilities, CDCR installed a permeable paved parking lot that allowed surface water to percolate through the asphalt and into the water table below to recharge the table and avoid water runoff. There are other opportunities under consideration for rain catchment systems in facilities with high precipitation levels to capture and redistribute excess rain.

Figure 36- Bioswales at CHCF

CDCR considers opportunities for living landscape to lessen the adverse effects of climate change; however, at times the Department is faced with overlapping sustainability initiatives such as renewable energy achieved by the installation of solar parking canopies or ground mounted systems that may require tree removal or other impacts to the existing landscape.

CDCR does not have any historical resources that include landscaping or areas where the landscaping is a contributor to an historic district. CDCR does not have any National Park Service-designated memorials as indicated in **Table 44** below.

Table 44- Summary of Living Landscape Inventory

Landscape (>500 Sq. ft.)	16,541,059
Turf (Sq. ft.)	20,526,107
Number of historical sites or memorials	0
MWELO landscape area (Sq. ft.)	0
Climate appropriate landscape area (Sq. ft.)	15,392,768

Large Landscape Water Use

Large landscape water use often represents a significant percentage of a facility's water use. In those cases, a significant water savings may be achieved through better irrigation scheduling or inexpensive improvements in irrigation hardware. As part of the Water Use Guidelines and Criteria, the water use for landscape areas over 20,000 sq. ft. shall be tracked through a water budget program.

CDCR will analyze the need for a landscape water budget to establish an efficient standard for landscape areas. As most facilities have only one water meter for their entire campus, it will require the purchase and installation of many meters. CDCR will also consider having the institution landscape maintenance staff attend an EPA WaterSense training program if feasible.

Figure 37- Climate-appropriate Landscape at CCI

CDCR has implemented a number of natural infrastructure solutions to mitigate the impacts of its projects. Earlier projects have funded and planned wetlands restoration or preservation projects, such as the installation of bioswales at the California Health Care Facility in Stockton, and more recently, wetlands avoidance and restoration at a construction site completed in 2016.

With drought restrictions lessened at most CDCR locations, CDCR will evaluate living landscape opportunity in future planning efforts. For example, planting additional trees to mitigate heat island impacts and using drought-tolerant native plants and landscape is a clear opportunity for inclusion in new projects. Reducing the heat island effect within prison yards is also underway, as the Department has completed several gardens inside prison walls with more planned. These gardens are also meant to be therapeutic and help educate the offender population about the value of preserving the natural environment.

Table 45- Summary of Large Landscape Inventory and Water Budget

Number of Facility Sites/Locations with > 20,000 Sq. ft. of Landscaping	40
Average Total Landscape Area per Facility (Sq. ft.)	375,433
Total Water Budget per Facility	TBD
Total EPA WaterSense or Irrigation Association Certified Staff	TBD

Best Management Practices

CDCR developed Best Management Practices (BMPs) for water conservation in 2008. Each institution developed site-specific water conservation practices based upon a statewide template. During the recent drought, CDCR developed a Statewide Drought Action Plan and required each institution to develop a site-specific plan and designate a WCM to lead Drought Task Force Teams. The Drought Action Plan required the institutions to update their site specific BMPs. After the BMPs were updated, institution staff were tasked with monitoring and inspecting to ensure compliance. Any issues or discrepancies were addressed at the institutional level. The BMPs will continue to be updated as needed and CDCR will consider incorporating a matrix for priority watering of key landscape areas. Below is the most recent statewide compilation of BMPs.

General

- Verify preventive maintenance schedules and work order requests are current for all water related systems identified in the checklist.

- Do not duplicate already completed activities. Coordinate all inspection and routine maintenance indicated below with recently completed regular inspections/preventive maintenance activities. Accelerate activities only as required to meet the goals of the Water Management and Conservation "Quick Check."
- Verify that all maintenance and repair activities related to water systems are documented in all standard maintenance activity logs, work order request systems, and SAPMS.
- Identify and investigate all miscellaneous water use that could be considered non-essential.
- Identify, modify, or establish procedures to minimize or eliminate non-essential water use.
    - Examples: Unused building areas, building wash-downs, sweeping instead of mopping or wash-downs.
- Institutions shall maintain landscape irrigation systems at designed levels unless directed otherwise by CDCR Executive Management. Comply with 2017 CDCR Statewide Drought Action Plan.

Water Management Planning

- Create a written water management and conservation policy statement addressed to staff that addresses CDCR's short-term water conservation goal, as well as expresses a commitment to long-term water management efficiency at the institution.
- Publicize the water management and conservation policy statement to staff and send a copy of the statement to Facilities Asset Management Branch (see contact information).
- Establish procedures to read the main facility water meter monthly and to report information to Facilities Asset Management Branch as required (see contact information and water use reporting information).

Information and Education Programs

- Post informational graphics and other staff outreach information provided to each institution according to accompanying instructions as part of a CDCR departmental water conservation outreach campaign.
- Develop a method to make staff aware of monthly water consumption.

Distribution System Audits, Leak Detection and Repair

- Perform a basic visual/audible leak detection survey of the primary water delivery and distribution systems.
- Identify all leaks as to location, affected building system, and relative severity (severe/minor).
- Repair all leaks as feasible; otherwise verify that all non-repairable leaks are adequately documented in maintenance management logs, SAPMS, etc.

Water-Efficient Landscaping

- Identify, modify, or establish procedures to prevent over-fertilizing and over-pruning.
- Identify, modify, or establish procedures to apply mulch regularly around ground covers, trees and shrubs.
- Identify, modify, or establish procedures to mow regularly, avoid scalping the turf, and alternate turf mowing height between low and high to promote deep rooting and less frequent watering.
- Weed regularly to avoid unwanted plants consuming water.
- Install shut-off nozzles or quick connect couplers for all hoses.
- Replace leaking shut-off nozzles, quick connect couplers and hoses.
- Install faucet timers for hose or hand irrigation.
- Identify, modify, or establish procedures to eliminate using water to clean walkways adjacent to landscaped areas.

Water-Efficient Irrigation

- Perform a basic visual leak detection survey of the primary irrigation system valves and distribution lines.
- Identify all leaks as to location and relative severity (severe/minor).
- Repair all leaks as feasible; otherwise temporarily cap off any unrepairable breaks or significant leaks at the closest feasible location.
- Inspect sprinkler and drip irrigation head function. Identify poor-performing or broken sprinkler heads. Replace, repair or adjust as required
- Adjust system to minimum specified pressure.
- Verify automatic irrigation controls and timers are functioning correctly.
- Verify irrigation schedules are appropriate for time of day, climate, soil conditions, plant materials, grading and season.
- Identify, modify, or establish procedures to avoid watering during heavy winds, or following 48 hours after rain.
- Identify, modify, or establish procedures to adjust irrigation times and durations seasonally.

Toilets and Urinals

- Repair leaks and restore fixtures to design level of function.
- Adjust fixtures to use the minimum amount of water required for proper function.
- If replacing broken fixtures, install water conserving devices.

Faucets and Showerheads

- Repair leaks and fix problems.
- Adjust fixtures to use the minimum amount of water required for proper function.
- If replacing broken fixtures, install water conserving devices.

Boiler/Steam Systems

- Perform a basic visual/audible leak detection survey of the primary steam distribution pipes and steam traps.
- Identify all leaks as to location and relative severity (severe/minor).
- Repair all leaks as feasible; otherwise verify that all non-repairable leaks are adequately documented in maintenance management logs, SAPMS, etc. (Be prepared to report data.)
- Inspect piping and main tank insulation; repair or replace as necessary.
- Identify, modify, or establish procedures to reuse steam condensate and boiler blow-down water for other purposes where feasible.
- Identify, modify, or establish procedures to avoid once-through/single pass operations.

Single Pass Cooling Equipment

- Perform a basic visual/audible leak detection survey of the primary cooling water distribution pipes.
- Identify all leaks as to location and relative severity (severe/minor).
- Repair all leaks as feasible; otherwise verify that all non-repairable leaks are adequately documented in maintenance management logs, SAPMS, etc. (Be prepared to report data.)
- Inspect piping, chiller and storage tank insulation; repair or replace as necessary.

Cooling Tower Management

- Perform a basic visual/audible leak detection survey of the primary cooling tower water distribution pipes.
- Identify all leaks as to location and relative severity (severe/minor).
- Repair all leaks as feasible; otherwise verify that all non-repairable leaks are adequately documented in maintenance management logs, SAPMS, etc. (Be prepared to report data.)
- Identify, modify, or establish procedures to eliminate once-through/single pass cooling, or for reusing the water elsewhere in the institution.
- Identify, modify, or establish procedures to use air cooling where feasible.
- Identify, modify, or establish procedures for water treatment to maximize cycles of concentration.
- Identify, modify, or establish procedures to reuse cooling tower effluent where possible.

- Identify, modify, or establish procedures to reuse treated wastewater or other non-potable water sources for cooling tower make-up.

Commercial Kitchen Equipment

- Perform a basic visual/audible leak detection survey of all kitchen devices using water.
- Identify all leaks as to location and relative severity (severe/minor).
- Repair all leaks as feasible; otherwise verify that all non-repairable leaks are adequately documented in maintenance management logs, SAPMS, etc. (Be prepared to report data.)
- Clean or replace high pressure pre-rinse spray valves.
- Identify, modify, or establish procedures to eliminate wasteful water use (e.g. do not use running water to melt ice; operate dishwashing equipment only when needed; wash only full loads).
- Identify, modify, or establish procedures to reuse final rinse water for garbage disposal and pre-wash functions.
- Limit garbage disposal use; hand-scrape food trays, receptacles, and utensils into garbage containers or equip sinks with strainers or mesh screens to divert food waste from the garbage disposal.

Laboratory/Medical Equipment

- Perform a basic visual/audible leak detection survey of all water distribution systems.
- Identify all leaks as to location and relative severity (severe/minor).
- Repair all leaks as feasible; otherwise verify that all non-repairable leaks are adequately documented in maintenance management logs, SAPMS, etc. (Be prepared to report data.)
- Identify, modify, or establish procedures to turn off any equipment not in use.
- Inspect solenoids and automatic shut-off valves for proper function and repair or replace as feasible.
- Verify that all equipment is set to minimum manufacturer pressure and flow rates.

Other Water Use

- Laundries
    - Identify, modify, or establish procedures to evaluate wash cycles and detergent/chemical formulation for maximum efficiency.
    - Identify, modify, or establish procedures to avoid excess filter and softener back-flush.
    - Identify, modify, or establish procedures to restrict use of equipment to only full loads.

    - Identify, modify, or establish procedures to minimize use of stand-alone washing machines.

- Vehicle Washing
    - Identify, modify, or establish procedures to keep records of water used per vehicle washed.
    - Determine the impacts of eliminating vehicle washing activities.
    - Verify all solenoids, valves, nozzles and other equipment are adjusted for minimum manufacturer pressure and flow rates.
    - Inspect jets and hose parts and replace as necessary.
    - Identify, modify, or establish procedures to reduce "show foam" to reduce need for rinse water.
    - Identify, modify, or establish procedures to use higher pressure rinses instead of flood arches.
    - Identify, modify, or establish procedures to use chemically compatible washing solutions and waxes to enable recycling together.

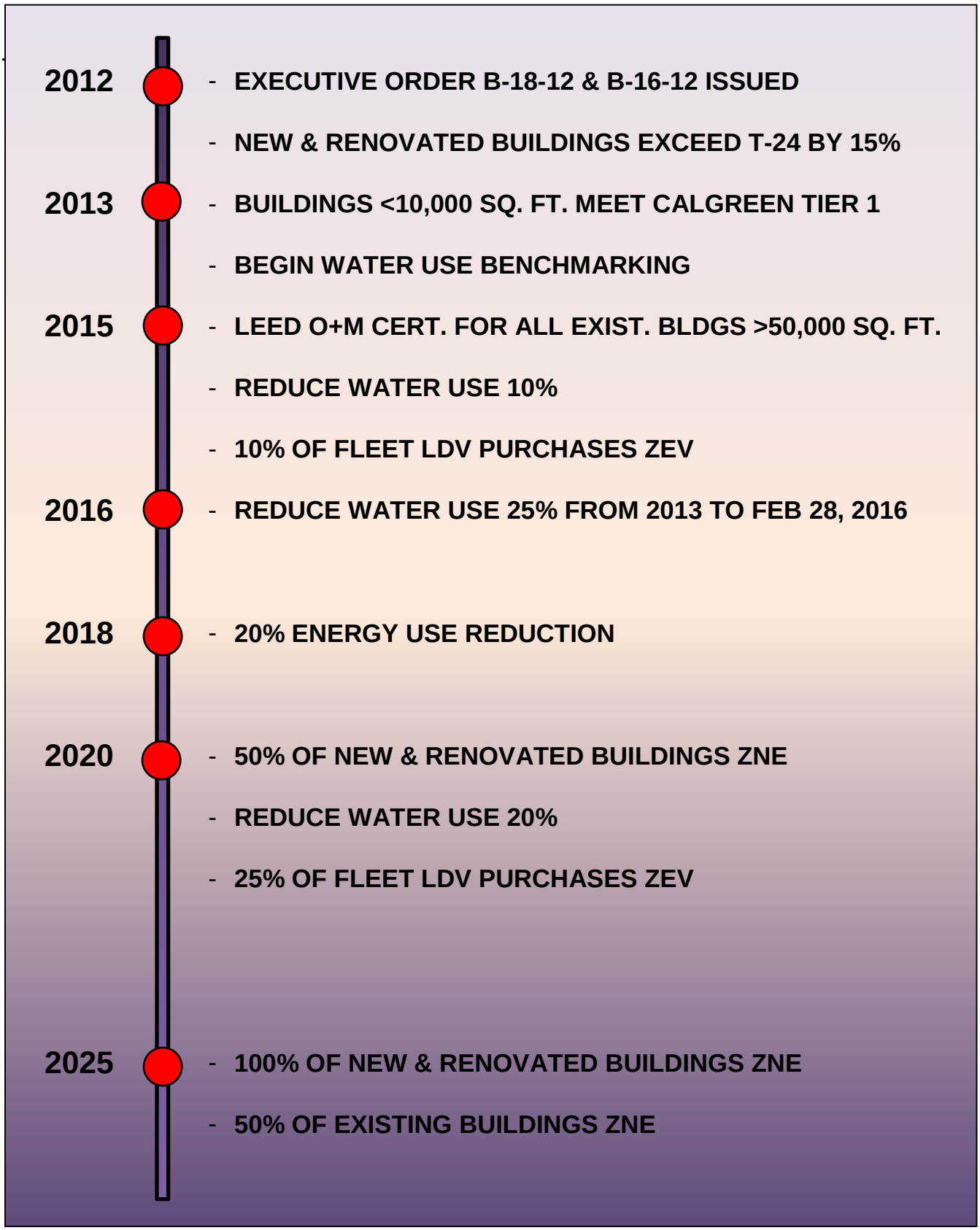
Moving forward, CDCR will continue to evaluate the BMPs and make modifications to incorporate other water conservation methodologies such as grasscycling, rainwater harvesting, and other new technologies as they become available.

Monitoring, Reporting, and Compliance

Each State Agency is responsible for monitoring water use and reporting baseline and annual water use for compliance with the water use reduction targets. Water use shall be measured at facilities that have meters and sub meters.

CDCR monitors and records water data from each institution on a monthly basis and the data is entered into the ESPM regularly. CDCR internally tracks and reports the average water usage at institutions and the percentage of water savings compared to the 2003 Baseline Usage. CDCR actively participates in the monthly Sustainable Building Workgroup meetings and also reviews the California Water Plan eNews publication to keep abreast of State legislation, mandates, and current trends related to water conservation.

SUSTAINABILITY MILESTONES & TIMELINE


2012
- EXECUTIVE ORDER B-18-12 & B-16-12 ISSUED
- NEW & RENOVATED BUILDINGS EXCEED T-24 BY 15%
2013
- BUILDINGS <10,000 SQ. FT. MEET CALGREEN TIER 1
- BEGIN WATER USE BENCHMARKING
2015
- LEED O+M CERT. FOR ALL EXIST. BLDGS >50,000 SQ. FT.
- REDUCE WATER USE 10%
- 10% OF FLEET LDV PURCHASES ZEV
2016
- REDUCE WATER USE 25% FROM 2013 TO FEB 28, 2016
2018
- 20% ENERGY USE REDUCTION
2020
- 50% OF NEW & RENOVATED BUILDINGS ZNE
- REDUCE WATER USE 20%
- 25% OF FLEET LDV PURCHASES ZEV
2025
- 100% OF NEW & RENOVATED BUILDINGS ZNE
- 50% OF EXISTING BUILDINGS ZNE

APPENDICES

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Acronyms

AB	Assembly Bill
AC	Alternating Current
ACA	American Correctional Association
A/E	Architects and Engineers
AP	Action Plan
ARRA	American Recovery and Reinvestment Act
ARB	Air Resources Board
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASU	Administrative Segregation Unit
BIS	Business Information Systems
BMP	Best Management Practices
CALGREEN	California Green Building Code (Title 24, Part 11)
CALPCA	California Procurement and Contract Academy
CALPIA	California Prison Industry Authority
CCHCS	California Correctional Health Care Services
CDCR	California Department of Corrections and Rehabilitation
CDs	Construction Documents
CPP	Centralized Procurement Program
CEC	California Energy Commission
CEQA	California Environmental Quality Act
COBCP	Capital Outlay Budget Change Proposal
CPPS	Capital Planning and Project Services Branch
CPUC	California Public Utilities Commission
DAC	Disadvantaged Communities
DCG	Design Criteria Guidelines
DD	Design Development
DESS	Design and Environmental Services and Standards Branch

DGS	Department of General Services
DWR	Department of Water Resources
ECAA	Energy Conservation Assistance Act
EEM	Energy Efficiency Measure
EHT	Extreme Heat Threshold
EIS	Enterprise Information Services
EMS	Energy Management System
EIR	Environmental Impact Report
EO	Executive Order
EPEAT	Electronic Product Environmental Assessment Tool
EPP	Environmentally Preferred Purchasing
ESCO	Energy Service Company
ESPM	Energy Star Portfolio Manager
ESS	Energy and Sustainability Section
EUI	Energy Usage Index
EVgo	EVgo Services LLC
EVSE	Electric Vehicle Supply Equipment (charging equipment)
FAMB	Facilities Asset Management Branch
FPCM	Division of Facility Planning, Construction and Management
FY	Fiscal Year
GCM	Global Circulation Model
GFMR	General Facilities Maintenance and Repair
GGE	Gasoline Gallon Equivalent
GHG	Greenhouse Gas
GHGe	Greenhouse Gas Emission
GO-Biz	Governor's Office of Business and Economic Development
GPS	Global Positioning System
GS	Green Seal
GSP	Groundwater Sustainability Plan
GVWR	Gross Vehicle Weight Rating

HCAB	Health Care Administration Building
HCFC	Hydrochlorofluorocarbons
HCFIP	Health Care Facility Improvement Program
HFC	Hydrofluorocarbons
HFM	Healthcare Facility Maintenance
HVAC	Heating, Ventilation, and Air Conditioning
IAQ	Indoor Air Quality
IEQ	Indoor Environmental Quality
IOU	Investor-Owned Utility
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
kBTU	Thousand British Thermal Unit
kWh	Kilowatt hour
LCM	Landscape Coefficient Method
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design®
LEED BD+C	LEED® for Building Design and Construction
LEED ID+C	LEED® for Interior Design and Construction
LEED O+M	LEED® for Building Operations and Maintenance
MAWA	Maximum Applied Water Allowance
MBCx	Monitoring Based Commissioning
MERV	Minimum Efficiency Reporting Value
MM	Management Memo
MPAR	Master Plan Annual Report
MPG	Miles Per Gallon
MW AC	Megawatts Alternating Current
MW	Megawatt
MWELO	Model Water Efficient Landscape Ordinance
NEM	Net Energy Metering
OBF	On-Bill Financing

OBR	On-Bill Repayment
OBS	Office of Business Services
OPC	Ocean Protection Council
OPOS	Office of Peace Officer Selection
PCC	Public Contract Code
PD	Project Director
PES	Performance and Environmental Standards
PG&E	Pacific Gas & Electric
PHEV	Plug-In Hybrid Electric Vehicles
PPA	Power Purchase Agreement
PPM	Project Procedures Manual
PSREC	Plumas Sierra Rural Electric Cooperative
PUC	Public Utility Code
PV	Photovoltaic
RCP	Representative Concentration Pathway
SABRC	State Agency Buy Recycled Campaign
SAM	*State Administrative Manual*
SAPMS	Statewide Automated Preventive Maintenance System
SB	Senate Bill
SBD	Savings By Design
SCE	Southern California Edison
SCG	Southern California Gas
SCM	State Contracting Manual
SCPRS	State Contract and Procurement Registration System
SDD	Standard Design Document
SDG	Sustainable Design Guidelines
SDG&E	San Diego Gas & Electric
SGA	Sustainable Groundwater Agency
SGC	Strategic Growth Council
SGMA	Sustainable Groundwater Management Act

SMUD	Sacramento Municipal Utility District
SPLC	Sustainable Purchasing Leadership Council
SPPA	Solar Power Purchase Agreement
STU	Statewide Transportation Unit
SUV	Sports Utility Vehicle
UHII	Urban Heat Island Index
US DOE	United States Department of Energy
US EPA	United States Environmental Protection Agency
USGBC	United States Green Building Council
VFD	Variable Frequency Drive
VOC	Volatile Organic Chemical
WMC	Water Management Coordinator
ZEV	Zero Emission Vehicle
ZNE	Zero Net Energy

CDCR Facility Acronyms

ASP	Avenal State Prison
CAL	Calipatria State Prison
CAC	California City Correctional Facility
CCC	California Correctional Center
CCI	California Correctional Institution
CCWF	Central California Women's Facility
CEN	Centinela State Prison
CHCF	California Health Care Facility
CIM	California Institution for Men
CIW	California Institution for Women
CMC	California Men's Colony
CMF	California Medical Facility
COR	California State Prison, Corcoran
CRC	California Rehabilitation Center
CTC	Richard A. McGee Correctional Training Center
CTF	California Training Facility
CVSP	Chuckawalla Valley State Prison
DVI	Deuel Vocational Institution
FSP	Folsom State Prison
HDSP	High Desert State Prison
ISP	Ironwood State Prison
KVSP	Kern Valley State Prison
LAC	California State Prison, Los Angeles County
MCSP	Mule Creek State Prison
NCYCC	Northern California Youth Correctional Center
NKSP	North Kern State Prison
PBSP	Pelican Bay State Prison
PVSP	Pleasant Valley State Prison
RJD	Richard J. Donovan Correctional Facility

SAC	California State Prison, Sacramento
SATF	Substance Abuse Treatment Facility
SCC	Sierra Conservation Center
SOL	California State Prison, Solano
SQ	San Quentin State Prison
SVSP	Salinas Valley State Prison
VSP	Valley State Prison
VYCF	Ventura Youth Correctional Facility
WSP	Wasco State Prison

Glossary

Acre-foot: volume equal to water one acre in area and one foot deep

Cogeneration: also known as combined heat and power, use of a heat engine or power station to generate electricity and heat (and sometimes cooling and/or industrial chemicals)

Easement: right to use or enter land owned by another partner

Grasscycling: the leaving of chopped grass clippings on a mowed lawn as a fertilizer

Level 1 charging: provides 120 V charging of approximately 2-5 miles of range per hour charged

Level 2 charging: provides 208 or 240 V charging of approximately 10-20 miles of range per hour charged

Lighting Power Density: watts per square foot, or energy consumed divided by the size of a space

Minimum Efficiency Reporting Value (MERV): scale for rating the effectiveness of air filters

Plug Load Management: tracking and/or controlling energy used through a building's electrical outlets

Rainwater harvesting: rainwater collection and storage systems used to offset potable water needs for a building and/or landscape, usually consisting of a surface for collecting precipitation (roof or other impervious surface) and a storage system

Real property: legally defined land with man-made improvements

Urban forest: a densely wooded area located in a city

vermicompost/vermiculture: compost resulting from use of worms to create mixture of decomposing organic waste and worm manure