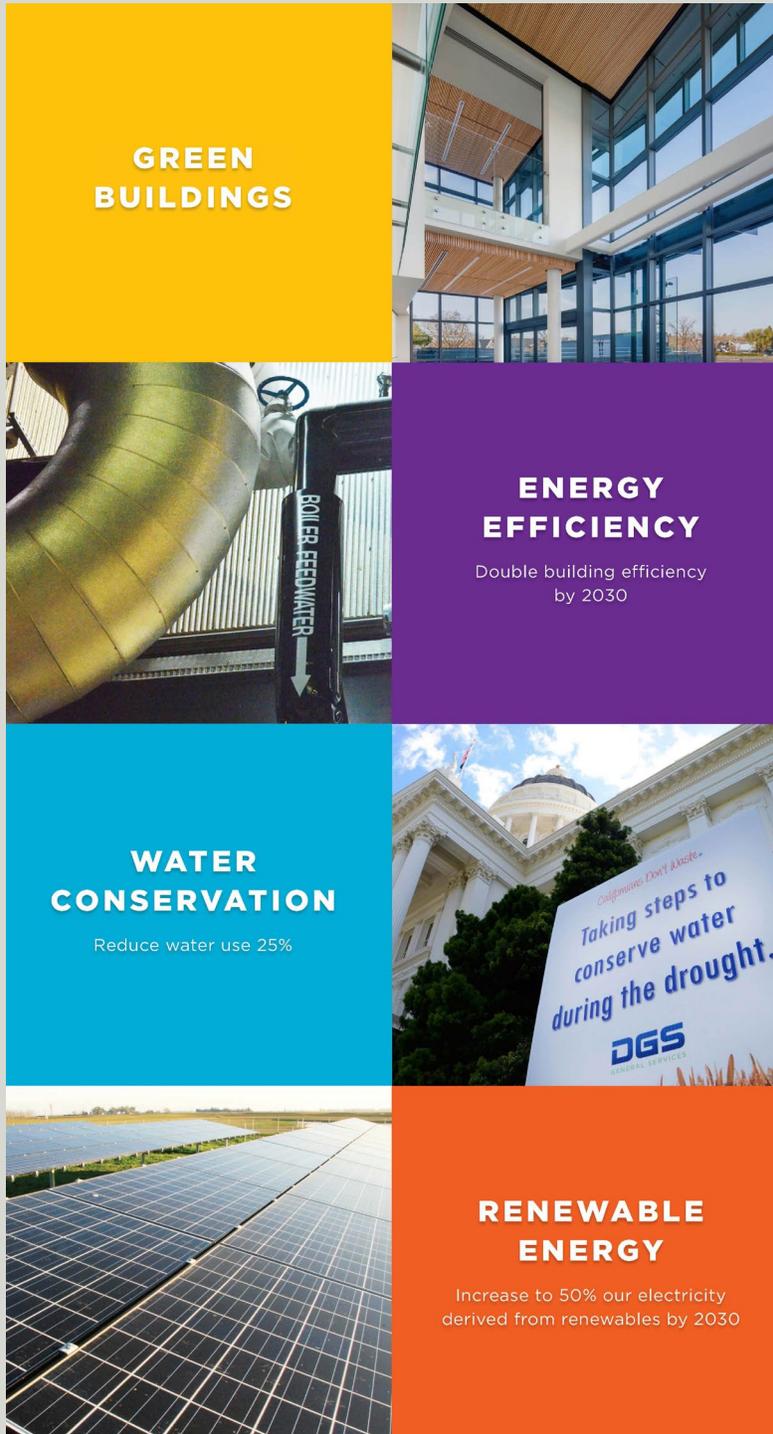


2014 California State Facility Water and Energy Benchmarking Report



Executive Summary

In 2012, Governor Edmund G. Brown Jr. issued Executive Order (EO) [B-18-12](#), declaring that “green building practices use energy, water, and materials efficiently throughout the building life cycle, enhance indoor and outdoor air quality, [and] improve the health, productivity, and working lives of state employees.” In accordance with the order, the State of California strives to be a leader in these areas.

EO [B-18-12](#) mandates that state energy and water use be benchmarked and reported using the online tool ENERGY STAR Portfolio Manager (ESPM). Benchmarking is the process of collecting performance data for a facility and comparing that data to a standard metric, usually the best performance practices for that type of facility. Energy and water benchmarking of state buildings is important because it can motivate facilities to improve, and allows for comparing progress with other buildings.

In 2014, the state reduced water use by 22 percent compared to 2010, meeting the EO’s reduction goal of 20 percent by 2020, and is well on its way toward meeting the energy goal of 20 percent by 2018. State department energy use dropped by 14 percent compared to the 2003 baseline. In addition, 2014 saw an increase in on-site renewable generation, now accounting for 12 percent of total state energy use.

For the second year, in 2014 reporting took place using ESPM. Departments worked diligently to set up automatic download of their energy data from utility providers where possible, which increased efficiency and accuracy. Currently about 80 percent of all state facility electric meters are automatically uploading into ESPM by utility providers, and as well as some gas meters.

Thirty-five departments report under EO [B-18-12](#). The 2014 reporting marked the first year all departments completed their water reporting on time. Thirty-three state departments have reported for Energy, three are still finishing their portfolios (California Highway Patrol, Capital Area Development Authority and California Department of Forestry and Fire Protection). This report provides an overview of the state’s benchmarking efforts for 2014.

Chart 1: State Energy and Water Goals

Governor Brown set aggressive goals to conserve water and reduce energy, including:

-  10% reduction of state agency water use from 2010 levels by 2015
-  20% reduction of state agency water use from 2010 levels by 2020
-  25% reduction of state agency water use from 2013 levels by 2016
-  20% reduction of state agency grid-based energy purchases from 2003 levels by 2018
-  40% of state electricity use will be derived from renewable sources by 2030

2014 Achievements at a Glance

In 2014, state-owned facilities made great progress in meeting the goals set forth by Governor Brown. A summary of these achievements for the state's 110 million square-foot portfolio include:



22% reduction from 2010-2014



14% reduction from 2003-2014



143 million kWh renewable sources



4.2 billion gallons saved



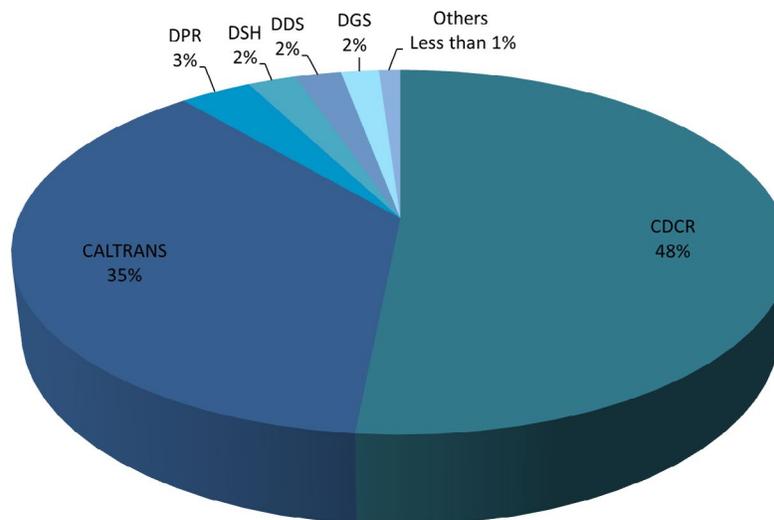
80,000 metric tons CO₂ reduced
from 2003

Water

In January 2014, Governor Brown declared a drought state of emergency, tasking the Department of General Services (DGS) with “immediately implement(ing) water use reduction plans for all state facilities.” Throughout 2014, state departments took many actions to reduce and conserve water at state buildings. The state reduced water use by 22 percent compared to a 2010 baseline, meeting the goal of 20 percent reduction by 2020 originally outlined in Executive Order [B-18-12](#).

In an unprecedented effort to conserve water, in 2014 the state managed to reduce its consumption by 23 percent compared to a 2013 baseline, almost meeting the new goal that would later be set by Governor Brown in February of 2015. As the drought worsens, state departments must lead the way for all Californians. The state departments that consume the most water are the California Department of Corrections and Rehabilitation (CDCR) and the Department of Transportation (Caltrans). These two departments account for more than 83 percent of state departments’ water use. Graph 1 displays the full distribution of state departments’ water use. *(See Appendix A for a list of department acronyms and the corresponding department descriptions.)*

State Water Use Distribution



Graph 1: Distribution of water use among all California state departments

Since 1990, Caltrans implemented policies and practices to be a good steward of the state’s water resources. Annual per acre water use for roadside planting has been reduced from 788,000 gallons per acre in 2009 to 163,000 gallons per acre in 2014. Caltrans set an aggressive goal to reduce its water use by more than 50 percent, and by the end of 2014 was more than halfway to achieving its goal with a reduction of 28 percent compared to a 2010 baseline. To achieve this reduction, Caltrans:

- Implemented a statewide drought action plan.
- Invested \$47 million in Caltrans emergency funding to upgrade or repair 1,250 irrigation systems statewide—approximately 25 percent of the state’s system—including smart controllers that cut water use at least 50 percent by automatically adjusting water usage based on weather conditions, soil moisture or broken pipes.
- Postponed 34 landscaping projects, which included 26 projects that would have started in 2014.
- Invested \$8 million in four major water recycling projects in San Luis Obispo, Shasta and San Diego counties.
- Cancelled any turf or grass watering, including watering at all state rest stops, unless recycled water is used.

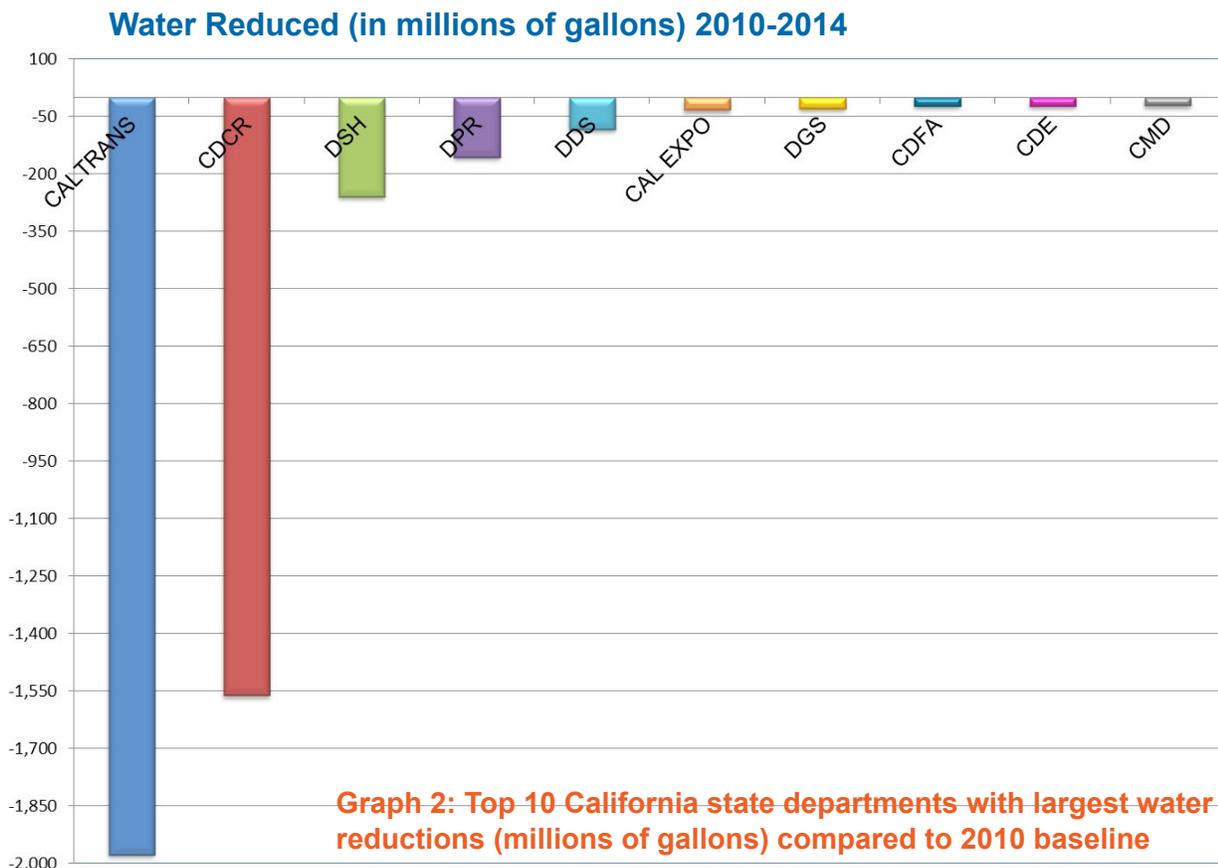
- Shut off irrigation entirely in areas of the state with the most severe drought conditions, and continues to do so. Caltrans has installed essential landscaping for the purposes of preventing water pollution and erosion, or to reduce fire risk. Those projects only use inert ground covers, such as mulch, gravel or drought-tolerant plants.
- For Caltrans-owned buildings—Installed low-flow water faucet aerators and checked automatic sensors on faucets, toilets and urinals to ensure they are operating properly and avoid unnecessary water use.
- Ceased use of water features, window washing and state vehicle washing unless for health or safety issues.

For the past decade, CDCR has sought to conserve water through water efficiency measures including the installation of water-restricting shower and toilet-flushing control devices. These efforts have reduced water consumption by 37 percent from 2003 to 2014.

In response to the current drought, CDCR has:

- Instituted a statewide mandatory drought action plan.
- Designated at each institution a water conservation manager and a drought task force team to implement site-specific action plans in order to reduce usage by 25 percent and higher for urban water suppliers.
- Prohibited all landscape watering with potable water.
- Limited shower durations and ceased the state vehicle washing program.
- Educated staff and inmates on conservation practices.

While these two departments account for the biggest users, most state departments under the executive order made great strides in reducing water use. Between 2010 and 2014, 15 of 34 reporting departments either met or exceeded the 20 percent goal, and 18 departments had a 15 percent reduction or better. Graph 2 below displays the departments that most successfully reduced their usage. (See Appendix A for a list of department acronyms and the corresponding department descriptions. For a complete listing of department water use for 2014 compared to the 2010 baseline, see Appendix B.)



Although 10 departments had an increase in water use, three of the increases were due to large, previously undetected leaks that have since been fixed. Due to special considerations because of the severe drought, water is currently being measured against an additional baseline year, 2013. An additional goal of 25 percent reduction compared to a 2013 baseline has now been set. Departments made significant reductions from 2013-2014. Eighteen departments had reductions of 20 percent or more and only five departments had an increase. *(For a complete listing of 2014 water use compared to a 2013 baseline, please see Appendix C.)*

All departments implemented extreme water-conserving measures. Below are highlights of some departments' actions:

- Reducing landscaping irrigation, changing watering schedules and delaying plantings gave most departments the biggest reductions.
- Reducing watering at Capitol Park, resulting in a 40 percent reduction in water use in 2014 (Department of General Services).
- Replacing float assemblies on cooling towers to minimize risk of overflowing the towers during times of non-operation (Department of Public Health).
- Shutting down coolers early toward the end of the day, or completely in good weather (Department of Consumer Affairs).
- Repairing or capping broken water lines (Employment Development Department).
- Replacing restroom fixtures to low-flow and making leak repairs a priority (California Military Department).
- Utilizing reclaimed water where appropriate (Department of State Hospitals).
- Replacing/upgrading inefficient water-cooling systems (California Office of Emergency Services).
- Eliminating after-hours HVAC use (cooling towers are a major source of water usage) (California Public Employees' Retirement System).

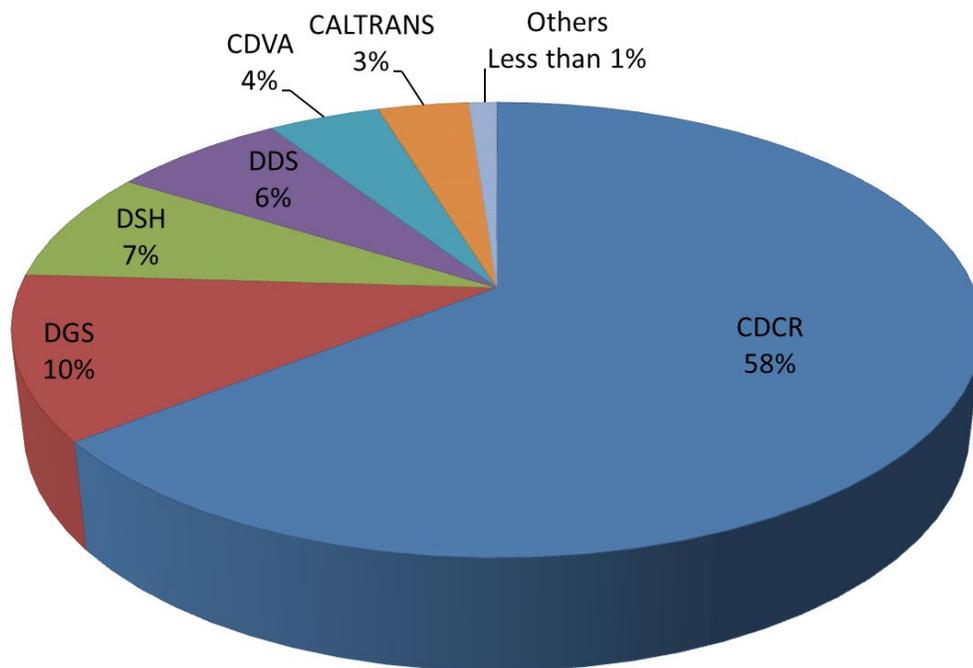
(Complete water use totals for 2010, 2013 and 2014 can be found in Appendix D.)

Energy

Executive Order (EO) [B-18-12](#) sets forth aggressive targets for state agencies and departments to reduce greenhouse gas emissions, and reduce grid-based energy. Grid-based energy purchases are to be reduced by 20 percent by 2018, compared to a 2003 baseline. Due to efforts by state departments, the state has reduced its overall energy consumption by 14 percent compared to a 2003 baseline. In April 2015, EO [B-30-15](#) was released, calling for a reduction of 40 percent greenhouse gas emissions by 2030. Building energy emissions are a large part of total GHG emissions for departments and the state as a whole. Energy savings in 2014 from state buildings accounted for a reduction in GHG emissions of almost 80,000 metric tons of carbon dioxide equivalent (CO₂e). In addition, the increase of renewable on-site generation will further assist in the accomplishment of this goal.

The California Department of Corrections and Rehabilitation (CDCR) accounts for the majority of state energy use, comprising 58 percent of total state department energy use. The next biggest user is the Department of General Services (DGS), which owns many large office buildings, including the State Capitol building. A full breakdown of the state energy distribution can be seen below in Graph 3. (See *Appendix A* for a list of department acronyms and the corresponding department descriptions.)

State Energy Use Distribution



Graph 3: Distribution of energy use among all California state departments

Since 2008, in partnership with California's utility companies, CDCR has completed 84 energy efficiency projects utilizing energy service companies (ESCOs), which have saved approximately 64 million kilowatt hours of electricity and over 2 million therms of natural gas. The incentives received for these projects total over \$16.5 million and the annual utility bill savings are approximately \$6.7 million. CDCR has achieved a 14 percent reduction in energy use while also experiencing a 20 percent growth in total floor space since 2003. Some of the energy-efficient measures include lighting retrofits and upgrades to LED lighting, installing variable frequency drives on fans and motors, and replacing boilers and other inefficient mechanical equipment.

Furthermore, CDCR has been a leader in on-site renewable generation and has installed 33.63 megawatts alternating current (AC) of solar photovoltaic arrays at 12 institutions, and is currently collaborating with DGS to install an additional 34 megawatts AC of wind turbines and solar arrays. The current CDCR renewable portfolio accounts for approximately 10 percent of the department's total energy use.

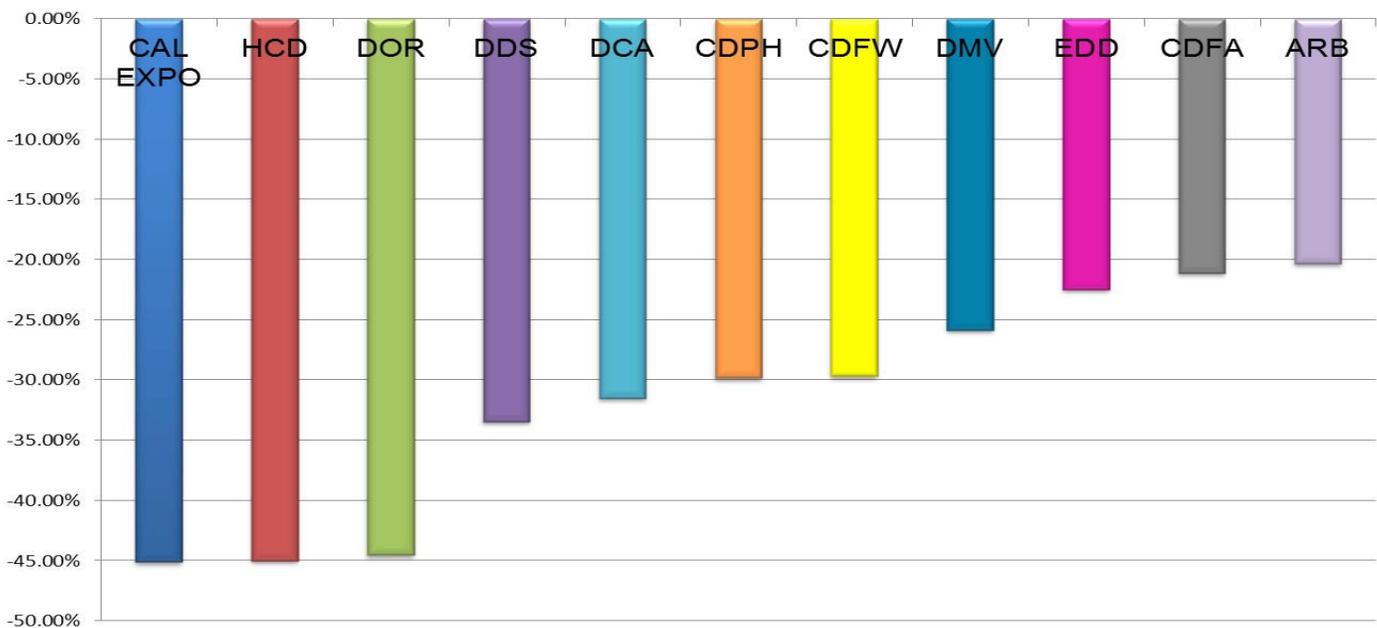
Likewise, DGS has done much to reduce its energy usage and in 2014 had a 19 percent reduction compared to 2003, almost meeting the goal of 20 percent by 2018 set forth in EO [B-18-12](#). DGS has completed retrofits and energy efficient upgrades in over 30 buildings from 2003-2014. Some of these energy saving actions include:

- Total building lighting retrofit in a few buildings; in many others upgraded lighting fixtures.
- Automated Demand Response program which provides load shedding of lighting and building automated control system during peak periods of the day.
- Data center upgrades.
- Completed building automated control system upgrade, added automatic controls to existing boilers and conducted a complete system commissioning.
- Replaced cooling towers with more efficient models.

Similar to CDCR, DGS has a commitment to renewable energy. Despite having much less space on which to build renewable on-site generation arrays, DGS has entered into a partnership with the Sacramento Municipal Utility District (SMUD) for a 5 megawatt solar array to be built in Sacramento that would supply energy to DGS downtown buildings.

Many other departments have shown large decreases in 2014 as well. See Graph 4 below for a list of departments with the biggest reductions in energy use. *(See Appendix A for a list of department acronyms and the corresponding department descriptions. For a full listing of 2014 energy use by department, please see Appendix E.)*

Largest Energy Reducers 2003-2014



Graph 4: California state departments with reductions in energy use over 20 percent compared to a 2003 baseline

Fourteen departments had a reduction of 15 percent or more in 2014, and 12 departments have already met the goal of 20 percent reduction or higher.

Many other departments have implemented energy-conserving actions, some of which include:

- Replacing equipment with more efficient versions (California Military Department).
- Monitoring monthly consumption usage and following up on alerts when usage exceeds the acceptable percentage amount (Employment Development Department).
- Downsizing of buildings or staff within buildings (Department of Food and Agriculture, Department of Developmental Services, Department of State Hospitals).
- Focusing more attention on heat efficiency (Cal Expo).
- Educating about and implementing energy conservation practices for staff and students (Department of Rehabilitation).

Seven departments have on-site generation totaling 143 million kilowatt hours generated in 2014, thus further reducing grid-based purchases and the state's GHG footprint. Total on-site generation accounts for about 12 percent of total state energy use.

Finally, 11 departments increased energy use in 2014. Over half of these were due to large increases in square footage between 2003 and 2014. Despite the increase in total energy usage, many departments have lowered their energy use intensity (EUI). In fact, 21 of the 34 departments have EUIs lower than average for their building type¹. These departments have a commitment to sustainability and many have buildings that are already Leadership in Energy & Environmental Design (LEED) certified by the U.S. Green Building Council. *(Total energy use and EUI breakdown by department can be found in Appendix F.)*

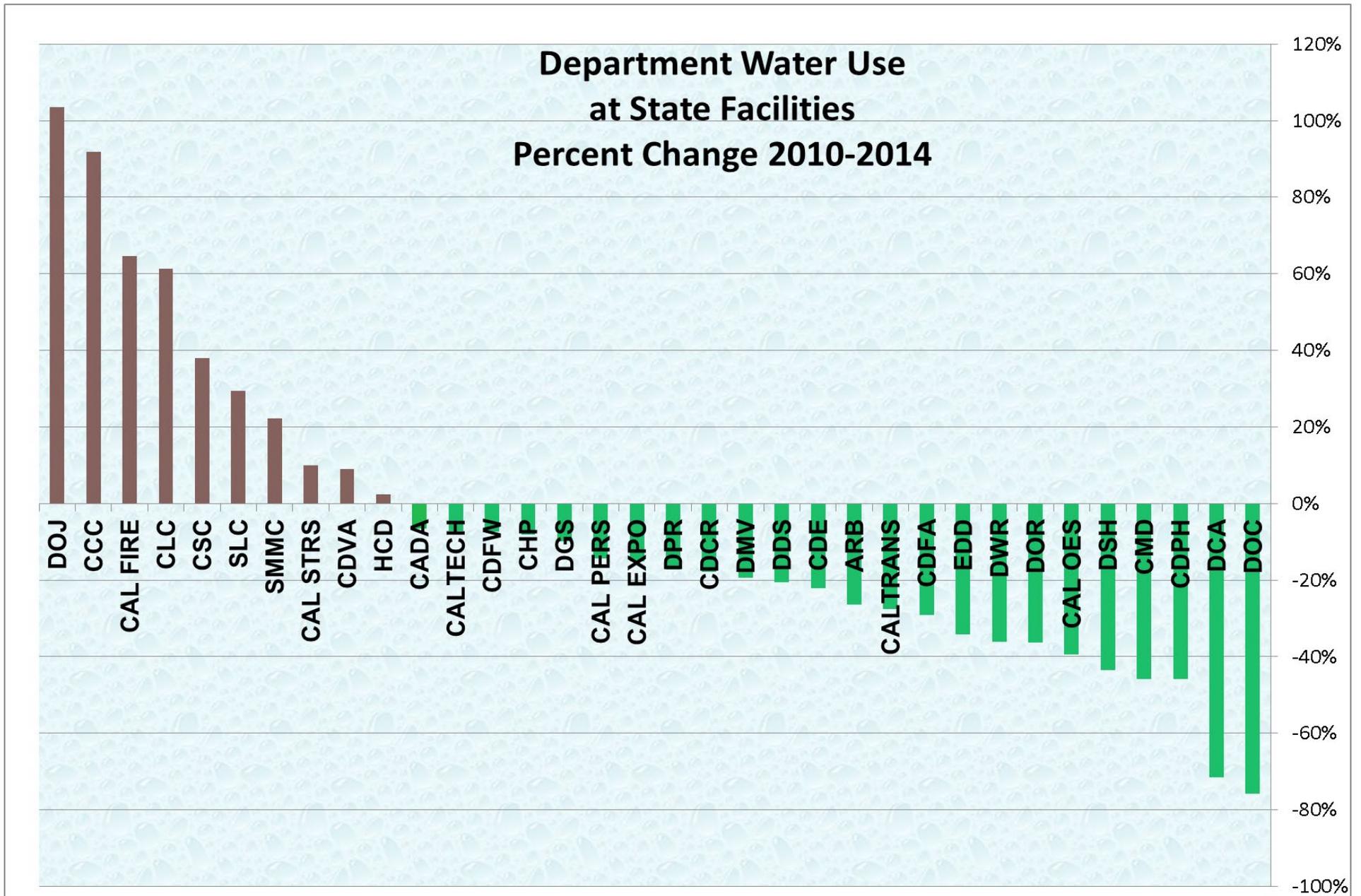
All values, percentages and other data in this report are current as of May 1, 2015. This report was prepared by the DGS Office of Sustainability. DGS is the reporting agency for benchmarking state water and energy use. For more information, contact sustainability@dgs.ca.gov.

¹ EUI values are from EPA ENERGY STAR Portfolio Manager technical reference guide and looked at most common building type within each department's portfolio.

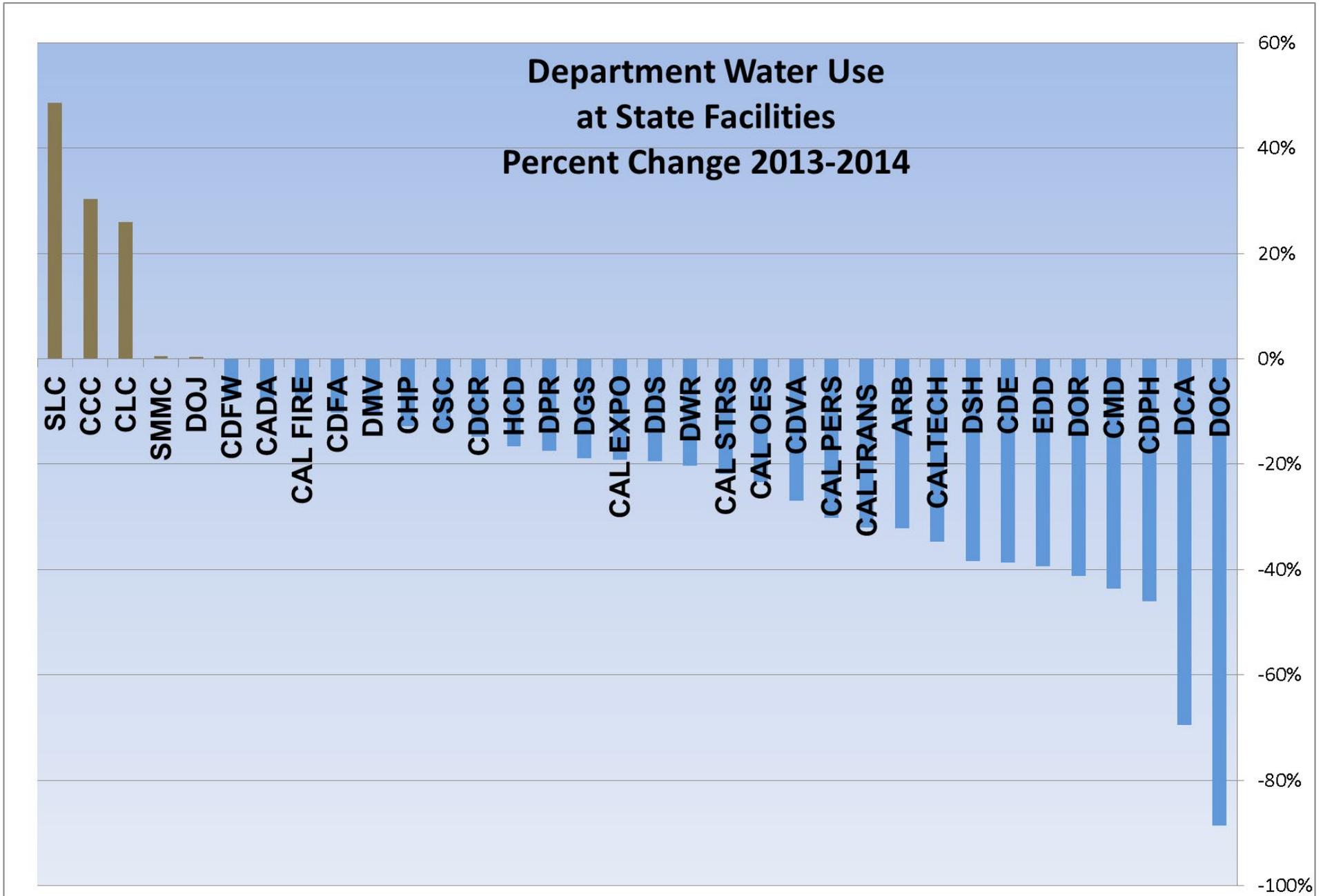
Appendix A: Legend for Department Acronyms

Dept. Acronym	Dept. Name
ARB	Air Resources Board
CAAM	California African American Museum
CADA	Capitol Area Development Authority
CAL EXPO	California Exposition & State Fair
CAL FIRE	California Department of Forestry and Fire Protection
CAL OES	California Office of Emergency Services
CAL PIA	California Prison Industry Authority
CAL PERS	California Public Employees' Retirement System
CAL STRS	California State Teachers' Retirement System
CCC	California Conservation Corps
CDCR	California Department of Corrections & Rehabilitation
CDE	California Department of Education
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CDVA	Department of Veterans Affairs
CHP	California Highway Patrol
CALTECH	Office of Technology Services
CALTRANS	Department of Transportation
CLC	California Lottery Commission
CMD	California Military Department
CSC	California Science Center
DAA	District Agricultural Associations
DCA	Department of Consumer Affairs
DDS	Department of Developmental Services
DGS	Department of General Services
DMV	Department of Motor Vehicles
DOC	Department of Conservation
DOJ	Department of Justice
DOR	Department of Rehabilitation
DPR	Department of Parks and Recreation
DSH	Department of State Hospitals
DWR	Department of Water Resources
EDD	Employment Development Department
HCD	Housing and Community Development
SLC	State Lands Commission
SMMC	Santa Monica Mountains Conservancy

Appendix B: Water use by department 2010-2014



Appendix C: Water use by department 2013-2014

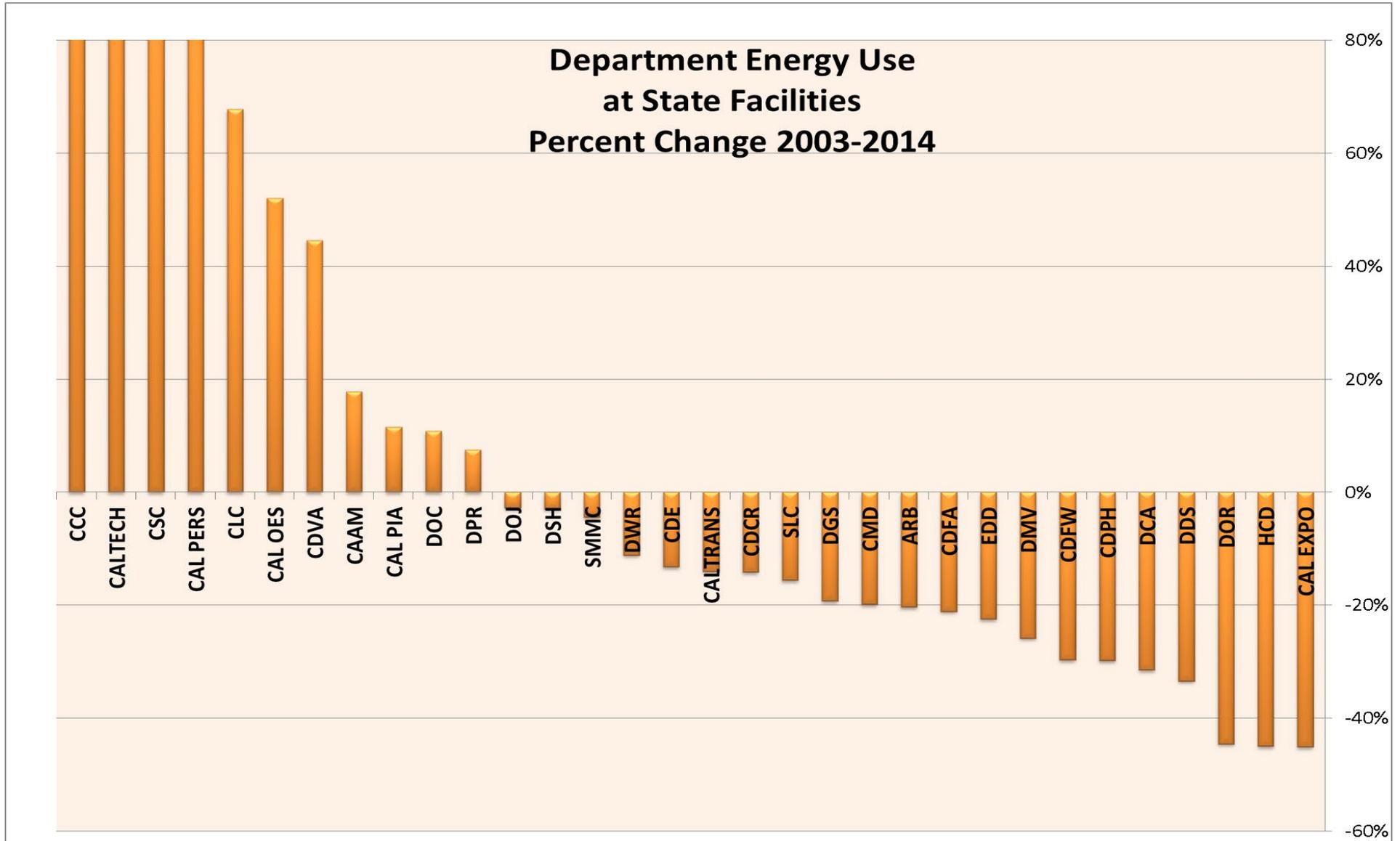


Appendix D: Water use totals by department

Dept. Acronym	2010 Water Use (Gallons)	2013 Water Use (Gallons)	2014 Water Use (Gallons)	% Change Water Use between 2010-2014	% Change Water Use between 2013-2014
ARB	474,232	514,624	349,316	-26.34%	-32.12%
CAAM	Reports Water with CSC				
CADA	22,054,107	22,270,772	20,587,548	-6.65%	-7.56%
CAL EXPO	214,833,080	225,781,930	182,392,320	-15.10%	-19.22%
CAL FIRE	88,468,748	158,509,506	145,565,148	64.54%	-8.17%
CAL OES	3,408,872	2,698,204	2,067,615	-39.35%	-23.37%
CAL PIA	Reports Water with CDCR				
CAL PERS	26,285,550	32,279,342	22,515,256	-14.34%	-30.25%
CAL STRS	5,267,064	7,411,184	5,795,504	10.03%	-21.80%
CALTECH	11,641,124	16,545,012	10,800,372	-7.22%	-34.72%
CALTRANS	7,153,997,386	7,615,452,275	5,176,006,438	-27.65%	-32.03%
CCC	4,067,624	5,984,748	7,802,388	91.82%	30.37%
CDCR	8,764,795,527	8,455,961,123	7,202,302,918	-17.83%	-14.83%
CDE	99,034,459	125,573,163	77,078,273	-22.17%	-38.62%
CDFA	76,404,011	60,298,236	54,147,353	-29.13%	-10.20%
CDFW	51,831,550	49,687,583	46,760,531	-9.78%	-5.89%
CDPH	27,424,672	27,517,424	14,842,262	-45.88%	-46.06%
CDVA	178,875,950	267,109,618	194,945,293	8.98%	-27.02%
CHP	110,792,553	116,835,083	101,866,721	-8.06%	-12.81%
CLC	3,764,164	4,821,240	6,071,457	61.30%	25.93%
CMD	46,207,510	44,347,168	25,011,897	-45.87%	-43.60%
CSC	29,776,384	47,659,568	41,090,632	38.00%	-13.78%
DAA	Not Reported				
DCA	1,170,750	1,096,754	333,608	-71.50%	-69.58%
DDS	403,279,192	397,594,767	320,022,512	-20.64%	-19.51%

Dept. Acronym	2010 Water Use (Gallons)	2013 Water Use (Gallons)	2014 Water Use (Gallons)	% Change Water Use between 2010-2014	% Change Water Use between 2013-2014
DGS	292,596,649	325,019,846	263,562,931	-9.92%	-18.91%
DMV	84,278,656	76,058,091	67,969,122	-19.35%	-10.64%
DOC	770	1,646	187	-75.73%	-88.64%
DOJ	13,613,224	27,593,800	27,700,992	103.49%	0.39%
DOR	1,883,464	2,041,292	1,198,296	-36.38%	-41.30%
DPR	602,485,778	604,065,723	446,082,152	-25.96%	-26.15%
DSH	595,566,796	546,900,240	336,676,466	-43.47%	-38.44%
DWR	25,283,215	20,244,455	16,131,869	-36.20%	-20.31%
EDD	18,842,150	20,514,648	12,418,296	-34.09%	-39.47%
HCD	112,658,368	138,348,974	115,292,068	2.34%	-16.67%
SLC	9,975	8,688	12,909	29.41%	48.58%
SMMC	2,048,772	2,493,084	2,504,304	22.23%	0.45%
State Totals	19,073,122,326	19,449,239,811	14,947,904,956	-21.63%	-23.14%

Appendix E: Energy use by department 2003-2014



Appendix F: Energy use totals by department

Dept. Acronym	2003 Total Energy Use (kBtu)	2014 Total Energy Use (kBtu)	2014 Renewable (kwh)	% Change Energy Use 2003-2014	2003 Square Footage	2014 Square Footage	% Change Square Footage 2003 - 2014	2014 EUI*
ARB	9,596,397	7,645,095		-20.33%	53,797	53,797	0%	142.11
CAAM	2,635,191	3,104,743		17.82%	45,000	45,000	0%	68.99
CADA	Not Reported				529,432	529,432	0%	0.00
CAL EXPO	64,871,995	35,605,261		-45.11%	1,500,000	1,058,336	-29%	33.64
CAL FIRE	Not Reported					2,098,000		N/A
CAL OES	10,151,015	15,435,589		52.06%		117,704		131.14
CAL PIA	2,939,515	3,279,454		11.56%		60,000		54.66
CAL PERS	44,950,256	85,913,616		91.13%		1,493,000		57.54
CAL STRS	0	23,494,018		N/A		409,000		57.44
CALTECH	34,331,725	77,134,716		124.67%	154,250	154,250	0%	500.06
CALTRANS	362,487,225	311,451,468	3,527,078	-14.08%		8,052,000		38.68
CCC	2,851,171	6,913,965		142.50%		141,313		48.93
CDCR	6,345,905,884	5,447,275,143	65,473,868	-14.16%	36,544,310	44,363,275	21%	122.79
CDE	68,286,858	59,234,963		-13.26%	951,146	1,036,000	0%	57.18
CDFA	52,997,108	41,805,884		-21.12%		133,000		314.33
CDFW	91,142,669	64,089,124		-29.68%	1,283,369	1,099,000	-18%	58.32
CDPH	198,741,489	139,498,805		-29.81%	470,237	719,000	63%	194.02
CDVA	264,688,098	382,797,885	94,145	44.62%		2,537,143		150.88
CHP	Not Reported					1,198,000		0.00
CLC	7,544,197	12,658,920	42,433	67.80%	190,000	231,635	22%	54.65
CMD	124,791,142	100,006,184		-19.86%	3,416,996	3,584,000	5%	27.90

*EUI= energy use intensity. For more information on EUI, see the Energy Star Portfolio Manager [Technical Reference Guide](#).

Dept. Acronym	2003 Total Energy Use (kBtu)	2014 Total Energy Use (kBtu)	2014 Renewable (kwh)	% Change Energy Use 2003-2014	2003 Square Footage	2014 Square Footage	% Change Square Footage 2003 - 2014	2014 EUI*
CSC	23,579,027	48,158,842		104.24%	306,648	1,770,000	346%	27.21
DAA	Not Reported							N/A
DCA	1,269,963	869,936		-31.50%	30,893	30,893	0%	28.16
DDS	894,589,224	595,551,605		-33.43%	5,382,990	3,404,000	-37%	174.96
DGS	1,236,438,438	997,788,466		-19.30%		15,775,000		63.25
DMV	179,109,941	132,824,948		-25.84%	1,857,677	1,572,347	-15%	84.48
DOC	70,706	78,351		10.81%	2,000	2,000	0%	39.18
DOJ	35,909,322	34,887,264		-2.85%		173,108		201.53
DOR	6,595,849	3,658,269		-44.54%		42,152		86.79
DPR	69,233,581	74,461,380	69,239,539	7.55%	6,146,477	6,718,000	9%	11.08
DSH	701,690,237	680,561,069	4,646,923	-3.01%	5,313,529	6,415,000	21%	106.09
DWR	21,610,885	19,197,798		-11.17%	184,639	405,000	119%	47.40
EDD	41,944,367	32,527,792		-22.45%	532,668	587,918	10%	55.33
HCD	37,441,235	20,598,028		-44.99%	1,614,600	1,697,000	5%	12.14
SLC	49,686	41,924		-15.62%	3,325	3,270	-2%	12.82
SMMC	386,640	369,304		-4.48%	20,429	20,429	0%	18.08
State Totals	10,938,831,037	9,458,919,808	143,023,986	-13.53%	66,534,412	107,729,002		