Green Action Team – February 19, 2009 Meeting
Small State Buildings
Energy Efficiency Toolkit

DGS has been working with facility managers, utility representatives, and industry experts to develop a set of measures to improve small structures in a comprehensive yet economical manner. Smaller facilities offer limited opportunities because they use less varied and complex equipment, so the following list focuses on measures that will be applicable to the majority of the targeted buildings:

Heating, ventilation, and air conditioning (HVAC) technologies:

Rooftop air conditioning unit tune-ups – Qualified technicians use the latest tools and technology to diagnose and correct problems with the charge, airflow, economizer, and thermostat controls of commercial packaged rooftop units (RTUs).

Load shifting – One example is making ice at night that will cool HVAC equipment during the day and reduce demand during peak hours, thereby lowering energy bills and easing transmission constriction.

Refrigerant subcooling – A central cooling tower to cool the refrigerant for multiple RTUs uses less energy than each RTU condensing refrigerant at ambient temperature, especially during the summertime.

Duct sealing – The loss of cooled or heated air through leaks in air ducts can increase HVAC energy usage by as much as 20 percent.

Lighting upgrades:

Wireless management systems – A wireless local area network connects lighting fixtures, switches, occupancy and photo (daylight) sensors, building automation, and control software so that lighting levels remain at an optimal level while energy use decreases.

Integrated office lighting systems – This new approach for lighting offices and cubicles uses a combination of daylight, pendant lighting, and desktop and under-cabinet task lighting.

T-8 upgrades – T8 fluorescent fixtures (the "T" stands for tubular, the shape of the bulb, and the number after it indicates the diameter size in eighths of an inch) operate on 32% less energy than T12 fixtures. Many field offices in various departments still have T12 fixtures.

Replacement of fluorescent lamps with light-emitting diode (LED) lamps - LEDs are tiny light bulbs that fit directly into an electrical circuit, and their illumination comes from the movement of electrons through a semiconductor material like silicon. They are now available in tube lighting that fits into fluorescent lamp fixtures. Industry studies indicate that LED tubes use about half as much electricity as fluorescent tubes; additional energy savings come from less use of air conditioning due to the lower temperature of the LEDs.

Parking lot lighting upgrades – The latest outdoor lighting technology has produced fixtures that use substantially less energy and mitigate night sky light pollution.

LED exit signs – One of these signs uses about 44kWh of electricity annually compared to the 140 kWh a fluorescent sign uses and lasts 10 or more years while the fluorescent lasts only about a year.

Occupancy sensors – Spaces with sporadic occupation like storage areas and stairwells do not require uninterrupted lighting.

Other technologies:

Server virtualization – This measure involves a method of running multiple independent virtual operating systems on a single physical computer, resulting in the use of less equipment and less energy.

High efficiency copiers – Efficient copiers use 30 to 40 percent less electricity than older models and may realize additional savings on air conditioning and maintenance expenses.

Vending machine controllers – Motion sensors and timers have the potential to reduce by 20 percent the amount of energy that vending machines consume.

Resource monitoring – Software takes information gathered from sensors at electricity, gas, and water meters to track consumption. This information enables facility managers to identify conservation opportunities and verify their effect.

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State Facilities in Investor-Owned Utility Service Territories and Eligible for Incentives		
Department	Number of Facilities	Total Square Feet
CA Conservation Corps (CCC)	41	77,750
CA Dept. of Education (CDE)	5	76,623
CA Dept. of Forestry & Fire Protection (CDF)	1,664	2,700,911
CA Highway Patrol (CHP)	96	562,251
Dept. of Food & Agriculture (DFA)	17	39,021
Dept. of Fish & Game (DFG)	384	566,259
Dept. of Motor Vehicles (DMV)	67	753,024
Dept. of Justice (DOJ)	4	89,781
Dept. of Rehabilitation (DOR)	1	42,278
Dept. of Transportation (DOT)	881	1,812,695
Dept. of Parks & Recreation (DPR)	3,366	2,739,411
Employment Development Dept.	15	281,575
Housing & Community Development (HCD)	7	315,233
Dept. of the Military	89	1,176,831
Santa Monica Mountains Conservancy (SMMC)	12	32,553
TOTAL	6,649	11,266,196