

CLIMATE ACTION TEAM

State Operations Working Group

Near-Term Implementation Plan

Strategy 2B: State Water Project Energy Efficiency

CAT Working Group Overview: The State Operations subgroup of the Climate Action Team is developing discrete measures aimed at reducing the greenhouse gas (GHG) emissions from operations of the State of California, based on parameters developed in the AB 32 Scoping Plan.

Working Group Agencies: State Agencies (Departments, Boards, Offices, etc.) participating in this group include: Cal/EPA, Department of General Services, Air Resources Board, Department of Toxic Substances Control, Department of Water Resources, Office of the Chief Information Officer, California Energy Commission, Department of Transportation, CalRecycle, and the Department of Finance.

Measure / Strategy

- A) Description: Hydropower meets the definition of a renewable energy resource, since it is produced by converting resources to electricity that is non-depletable or naturally replenished. The State Water Project (SWP) generates hydroelectric power annually; representing 40 percent to 60 percent of the SWP's annual energy requirements to pump water throughout California. Optimum water-to-energy conversion ratios result in substantial savings in pumpload demand, as well as increased hydrogeneration capacity. DWR Energy Efficiency Improvement programs include pump and turbine replacements and refurbishments at two key facilities: the A.D. Edmonston Pumping Plant and Edward Hyatt Powerplant. Since these new energy efficiency improvements displace power from fossil generation, the additional conserved or generated hydroelectric power allows the SWP to reduce the carbon footprint associated with its annual power purchases.
- B) Agencies Involved: Department of Water Resources
- C) Scoping Plan/Adaptation Plan Reference:
 1. California has established energy efficiency as its highest priority energy resource for procurement of new resources. Key legislation that established this priority are Assembly Bill 1890 (1996) and Assembly 995 (2000). Under this legislation, California established a "loading order" that calls for first pursuing all cost-effective efficiency resources, then using cost-effective renewable resources, and only after that using conventional energy sources to meet new load.¹

¹ http://www.aceee.org/energy/state/california/ca_utility.htm

2. AB 32 Scoping Plan: Key elements of California’s recommendations for reducing its greenhouse gas emissions to 1990 levels by 2020 include “expanding and strengthening existing energy efficiency programs.”²
3. Climate Adaptation Strategy: Adaptation strategies reflect the “loading order,” California’s policy which calls for “meeting new electricity needs first with energy efficiency.”³

D) Metrics: Hydroelectric power avoids releases of GHGs associated with alternative thermal generation resources. CO₂ emissions reductions associated with the SWP Energy Efficiency programs are measured by applying two primary variables to estimate the energy displaced as each new or refurbished unit is brought on-line:

1. the cumulative verified emissions rate for SWP power purchases and sales transactions, and
2. a 10-year rolling average hydroelectric generation and pumpload at Hyatt and Edmonston.

DWR refines and updates its calculations throughout the year, and annually publishes its findings. For example, the most recent emissions rate reflects average power purchases and sales transactions emissions rates from January 2007 through December 2009; The most recent 10-year rolling average hydroelectric data links energy savings to the fluctuations in hydrologic conditions from year to year. Existing and future annual efficiency gains from the two programs are analyzed from 2003, when the first generator at Hyatt was refurbished, through 2020, when the last proposed pump turbine replacement at Edmonston will be completed.

E) Crosscutting Issues: This strategy may overlap/intersect efforts by the Water Energy Team of the CAT (WETCAT).

F) Tasks and Deliverables:

1. Description: DWR’s membership in the California Climate Action Registry (CCAR) since 2006, and its new membership in The California Registry (TCR)⁴ provide a consistent and transparent reporting mechanism to calculate an independently verified rate of emissions that can be applied to the annual MWh savings to approximate the SWP’s continuing accomplishments in meeting California’s GHG emissions reductions goals through large-scale, multi-year energy efficiency projects.

² Climate Change Scoping Plan, pg. 8, http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

³ Climate Adaptation Strategy, pg. x, <http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>

⁴ The CCAR reporting has been replaced permanently by its national sister organization, the Climate Registry (TCR). The CCAR emissions inventory will no longer accept emissions reports after 2010 (for 2009 emissions reporting).

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2. **Deliverables:** Using the verified emissions reports from the CCAR in the past, and TCR in the future, DWR publishes independently verified generation and emissions data related to the SWP owned and operated hydrogeneration and the relationship to its power purchase portfolio in the following reports:
 1. DWR’s bi-annual *Report to the California State Legislature Regarding its Energy Use and Purchasing Activities*; and
 2. DWR’s annual *Report on Reducing the State Water Project’s Dependency on Fossil Fuels and Changes to the State Water Project’s Power Contracts Portfolio*.
3. **Agency Roles:** The Department of Water Resources is the lead entity on each deliverable, and which will provide a support function.
4. **Timeline:** The following table summarizes the most recent forecast Metric Tonnes CO₂ conserved annually as a result of the SWP Energy Efficiency Programs.

SWP Hydroelectric Energy Efficiency Gains	Installation Timeframe	Annual MWh per Unit	Annual MWh per Program	Forecast MT CO₂e Conserved Annually
Edmonston Pumps				
Pumps 2, 4, 6, 8	2007 - 2011	10,202	40,807	12,446
Pumps 1, 3, 5, 7, 9, 11, 13	2012 - 2020 (proposed)	10,202	71,412	21,781
Hyatt Generators				
Generators 1, 3, 5	2003 - 2004	17,326	51,977	15,853
Generators 2, 4, 6	2005 - 2007	26,814	80,441	24,535

Each year, DWR issues three legislative reports (in January, March, and July) related to its GHG footprint, including updates on the SWP’s hydroelectric energy efficiency programs.

G) SUMMARY TABLE:

Deliverable	Agencies	Deadline
<i>Report to the California State Legislature Regarding its Energy Use and Purchasing Activities</i>	Department of Water Resources	Bi-Annually: January / July
<i>Report on Reducing the State Water Project’s Dependency on Fossil Fuels and Changes to the State Water Project’s Power Contracts Portfolio</i>	Department of Water Resources	Annually: March