

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791



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TO: Distribution List

The Supplemental Report of the 2007 Budget Act (Item 3860-001-0001) requires the Department of Water Resources (DWR) to report to the Chairs of the Senate and Assembly fiscal committees on DWR's efforts to reduce dependency on fossil fuels and changes to its portfolio of power contracts for the State Water Project. The passage of Senate Bill 85 in August 2007, which added Section (§)142 to the California Water Code, requires DWR to submit an annual report addressing the reductions in its greenhouse gas emissions related to water and energy use.

This report highlights the progress DWR has made in reducing its State Water Project emissions by investments in energy efficiency projects and plans to phase out a fossil fuel contract.

If you have any questions, please contact me at (916) 653-7007 or your staff may contact Carl Torgersen, Deputy Director for the State Water Project at (916) 653-8043.

Sincerely,

A handwritten signature in blue ink that reads "Dale K. Hoffmeyer".

for Mark W. Cowin
Director

Enclosures

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Electronic copy of transmittal letter and one-page Executive Summary distributed to members of the California Legislature.

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Secretary for Natural Resources
California Natural Resources Agency
1416 Ninth Street, Room 1311
Sacramento, California 95814

Keali'i Bright
Deputy Secretary for Legislation
California Natural Resources Agency
1416 Ninth Street, Room 1311
Sacramento, California 95814

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Department of Water Resources

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Department of Water Resources



The Department of Water Resources Report on Reducing Dependency on Fossil Fuels and Changes to the Power Contracts Portfolio

Executive Summary

The Department of Water Resources (DWR) shares California's goals for mitigating climate change impacts and effective management of carbon emissions. DWR makes use of a diverse energy portfolio to meet California's water needs. DWR is reducing its annual greenhouse gas (GHG) emissions and fossil fuel dependency through:

- Implementing DWR's Climate Action Plan, a programmatic California Environmental Quality Act (CEQA) document. The plan will meet and exceed California's emission reduction targets for 2020.
- Maintaining an optimal balance between loads and resources on the State Water Project (SWP) water conveyance system.
- Purchasing renewable energy from Alameda Municipal Power.
- Refining and expanding its programs to quantify and accurately report the SWP's operational impact on California's emission reductions goals.
- Implementing environmentally sustainable energy strategies that are responsive to hydrology, water delivery, facilities requirements, and energy market events.
- Identifying and investing in technologies that increase the SWP's percentage mix of cleaner, more efficient resources.
- Providing clean hydroelectric generation to the electric grid during critical peak hours.
- Improving the water to energy conversion ratios at key SWP hydroelectric facilities, annual GHG emissions savings from DWR's hydroelectric energy efficiency projects have reached 48,000 metric tons of carbon dioxide equivalent (CO₂e).
- Since 1983, DWR has received up to 235 megawatts of power from Unit 4 of the coal-fired Reid Gardner Power Plant in Nevada. DWR will not extend or renew the agreement when it expires in July 2013.

DWR's strategy and evolving policies to meet California's emissions reductions goals are reflected in this and other reports by DWR to the Governor and the Legislature.



Introduction

DWR is pleased to submit to the Legislature and to the Governor its 2013 report on the status of DWR's efforts to reduce its dependency on fossil fuels. Senate Bill 85 added Section (§) 142 to the California Water Code, to address reductions in GHG emissions associated with water and its energy usage. Specifically, §142(a) requires that by March 1, 2008, and at least annually through 2015, DWR will report:

- (1) The status of any contracts it has for fossil fuel generated electricity, and its efforts to reduce its dependency on fossil fuels; and
- (2) Changes to the existing energy portfolio that alters the contracts' costs, term, quantity, or composition of resources that deliver power under the contracts.

The majority of this report focuses upon the status of the contracts and the changes to the power portfolio for the SWP, with an emphasis on calendar year 2012 data.

The California State Water Project

DWR is classified in the North American Industry Classification System under the Public Administration of Environmental Quality Program Sector. This industry includes government establishments primarily engaged in the administration, regulation, and enforcement of water resource programs, flood control programs, drainage development and water resource consumption programs, and coordination of these activities at intergovernmental levels. DWR's mission is to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

Consistent with its mission, DWR is charged with management of the SWP, the largest state-built, multi-purpose water project in the country. The SWP was designed and built to deliver water, control floods, generate power, provide recreational opportunities, and enhance habitats for fish and wildlife. DWR has contracts with 29 local water agencies for delivery of up to 4.2 million acre-feet of water per year. Water deliveries serve 25 million people and provide irrigation for 750,000 acres of farmland.



DWR operates the SWP pumping and generating facilities to (a) provide for safety and flood control needs; (b) comply with environmental regulations; (c) meet water supply and delivery needs; (d) minimize cost of water deliveries; and (e) provide support for the electricity grid for the California Independent System Operator during the critical periods of peak demand. All of DWR's power activities are related to making water deliveries and supporting California's electricity grid. These water deliveries, combined with the variability of water supply required for its hydrogeneration plants, render DWR's energy demand and supply highly variable and difficult to predict from year to year.

The SWP is the third largest generator of clean hydropower in California. The SWP's hydrogeneration capacity exceeds 1,900 MW accounting for 2 percent of California's total generating capacity.

Table 1 summarizes SWP generation capacity by plant facility, as well as the capacity associated with the energy share from Reid Gardner Power Plant Unit 4.

Table 1. SWP Generation Capacity

Power Plant	Capacity (MW)
Hyatt	819
Thermalito	113
Pine Flat	210
Gianelli	424
William Warne	76
Castaic	120
Alamo	16
Mojave Siphon	14
Devil Canyon	235
Reid Gardner Unit No. 4	250
Total Capacity	2,277

In 2012, SWP owned and operated hydroelectric generation resources and pump load demand decreased by 21 percent and 13 percent, respectively, from 2011 levels. The key driver of this reduction was hydrology based.



The SWP's pumping capacity equals 2,600 MW. In 2012, the SWP consumed 7.4 million MWh to deliver 2.9 million acre-feet of water, representing about 3 percent of total electricity usage in California. For calendar year 2012, the energy required to deliver water was derived from SWP and off-Aqueduct hydrogeneration resources (56 percent), purchases from CAISO market (29 percent), and from DWR's contract to receive electricity from the Reid Gardner coal-fueled power plant in Nevada and the natural gas plant at the Lodi Energy Center (LEC) (15 percent).

The State Water Project Power Portfolio Overview

DWR develops and administers a comprehensive power resources program for the strategic timing of generation and pumping schedules, acquisition of power resources and transmission services, short-term sales of energy surpluses, and forecasts of resources in the future. The SWP's energy portfolio is made up of the SWP's own hydropower resources, including the Hyatt-Thermalito Pumping-Generating complex, the SWP aqueduct's recovery plants (Gianelli, Alamo, Devil Canyon, and William Warne), and the Mojave Siphon generation plant.¹

The SWP receives additional hydroelectric energy and capacity through long term agreements with the Kings River Conservation District (KRCD), the Los Angeles Department of Water and Power (LADWP), and the Metropolitan Water District (MWD). DWR's non-hydroelectric energy resources include Reid Gardner Power Plant Unit 4, which under the *Participation Agreement*, DWR receives up to 90.4 percent of the energy output and Lodi Energy Center Power Plant, which DWR receives 33.5 percent of the energy output. DWR also receives renewable energy through an agreement with Alameda Municipal Power. DWR's market purchases make up the rest of the SWP's energy portfolio.

DWR typically schedules its pump-load during the off-peak hours, which substantially benefits California's electricity grid. During the off-peak hours, fewer generators cycle up and down in response to peak energy demand requirements. Off-peak operations receive energy from the generators that are more efficient. In addition, the efficiency of these generators is even more during the off peak periods due to cooler ambient temperatures. DWR tries to run its hydroelectric generating plants during on peak periods, which displaces less efficient and higher emission thermal peaking power plants.

SWP annual power costs have ranged from \$260 million to \$410 million in recent years. Approximately 96 percent of the costs of the entire SWP, including power costs, are paid by the 29 local agencies holding long-term water supply contracts with DWR. Increased costs for power and transmission, coupled with reduced water availability have raised the unit cost of water.

¹ Gianelli Pumping-Generating Plant is a joint DWR and U.S. Bureau of Reclamation (USBR) facility; DWR's share is 222 MW; USBR's share is 202 MW.



DWR Emissions Reductions Programs and Strategies

The development of reliable, clean and renewable energy sources and effective management of carbon emissions are critical for national and global security, and environmental health. To mitigate climate change impacts, California shares the national and international goal of reducing GHG emissions, expanding energy efficiency programs and renewable energy resources, and implementing low-carbon fuel standards. With its diverse energy portfolio to meet California's water and energy needs, DWR is reducing its GHG emissions and fossil fuel dependency as follows:

- Maintaining a continuous balance between resources and demand on the SWP's system through self-generation of clean hydroelectric power, load management, exchange agreements, and specified and unspecified market purchase and sales transactions. DWR analyzes SWP transactions data for trends in energy usage and GHG emissions that impact its legislatively mandated responsibilities.
- The Governor's Executive Order S-3-05 (*The Impacts of Climate Change*) and Assembly Bill 32 (AB 32 -- *The California Global Warming Solutions Act of 2006*) mandates the reduction of California's GHG emissions to 1990 levels by 2020. DWR defines its 1990 carbon footprint consistent with California's GHG inventory, a compilation of statewide GHG emissions and sinks.² DWR applies calendar year 1990 as reference year to quantify the SWP's carbon footprint. DWR will meet or exceed California's 2020 emission reduction goals.
- In 2012, the CARB held its first auction of GHG allowances and developed implementation documents laying out the process for review and consideration of the new offset protocols. DWR will continue to refine its programs to quantify and accurately report the SWP's operational impact on California's emissions reduction goals. DWR communicates extensively with government and private entities to ensure that its efforts align with national and State legislation and policy directives.
- DWR implements environmentally sustainable energy strategies depending upon hydrology, water deliveries, SWP hydroelectric equipment and facilities requirements, and energy market events.
- DWR is investigating and investing in highly efficient generation technologies such as combined-cycle, combined heat and power, solar, and wind energy to increase the SWP's portion of cleaner and more efficient resources.

² See http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_by_ipcc_2007-11-19.xls. The California Air Resources Board (CARB) inventory draws upon data from the Intergovernmental Panel on Climate Change Second Assessment Report.



- DWR is working on a project to install a 10MW solar PV system at a property that it owns adjacent to the Pearblossom Pump Station, in eastern Los Angeles County. DWR has retained a consultant to assist in the interconnection process, and CEQA review is almost completed. The Phase 1 interconnection study from Southern California Edison (SCE) estimated \$83M to connect to SCE's distribution line, which is prohibitively expensive. DWR is evaluating the potential risks and impacts on pump station operations, and will decide whether to proceed with the project using the much less expensive option of connecting the solar system to a grid behind the meter, where the line is owned by DWR.
- DWR is evaluating 4 large parcels it owns adjacent to facilities in the San Joaquin Valley for potential use for renewable energy generation. CEC is assisting by screening for the presence of sensitive species or habitat at the sites.
- The SWP lowers the wholesale power grid emissions by offering clean hydroelectric generation to the market on peak hours. Consequently, the SWP's hydrogeneration resources displace energy from carbon producing generators that would otherwise be called upon to meet California's peak electricity demand.
- DWR invests substantial resources in engineering feasibility and design studies to implement programs to optimize water to energy conversion ratios at SWP hydroelectric facilities. DWR's energy efficiency programs include pump and turbine replacements and refurbishments to increase the SWP's overall system performance. The programs substantively reduce overall GHG emissions since the SWP hydroelectric units are using less energy to move more water, and generating more energy with less water.
- AB 32 mandated the California Air Resources Board (CARB) to adopt regulations for reporting of statewide GHG emissions by January 1, 2008, incorporating the standards and protocols developed by the California Climate Action Registry (CCAR). DWR submitted its fourth annual Mandatory Greenhouse Gas Reports to the CARB in May 2012. The report includes energy data for SWP hydroelectric facilities, plant capacities, and the SWP power portfolio.
- DWR's membership in "The Climate Registry" (TCR) and its participation in California's mandatory reporting requirements under AB32 serve as consistent and transparent mechanisms to report, update, track and verify DWR's carbon footprint. DWR's strategy and future policies to meet California's emissions reductions goals are demonstrated in these reports. DWR's emission report to the TCR was submitted in June 2012. Independent verification for DWR's 2010 report to TCR was successfully completed in October 2012. DWR submitted its 2011 annual GHG report to TCR in November 2012 - the verification is in progress.



- In February 2011, DWR issued a Request for Offer (RFO) for CARB accredited Verification Services for verification of the GHG emission for the reporting year 2010. DWR extended the contract for verification of its 2011 greenhouse gas emissions.

Under Water Code Section 142, DWR must comply with the same greenhouse gas emissions performance standards adopted pursuant to Section 8341 of the Public Utilities Code for a local publicly owned electric utility for new electricity contracts. DWR entered into a contract with Northern California Power Agency for a 33.5 percent generation share in the new LEC Power Plant, which meets and exceeds the performance standards required under Section 142 and Section 8341. LEC Power Plant started commercial operation on November 27, 2012. Since 1983, DWR has received up to 235 megawatts (MW) from Unit 4 of the coal-fired Reid Gardner Power Plant in Nevada. Upon its expiration in 2013, DWR will not extend or renew the agreement for getting energy from the Reid Gardner Power Plant, Unit 4.

Specified Energy Resources to Convey State Water Project Water

The SWP's electric power requirements are met with DWR's own and jointly developed hydroelectric facilities, and purchase agreements. DWR enters into agreements so that the SWP can sell, buy, and exchange capacity or energy to promote the most efficient use of its generating sources, pumping stations and water delivery schedules. The SWP's energy portfolio includes the following:

Hydroelectric Generation

Hydropower is renewable energy, since it is "energy drawn from a source that is infinite or is replenished through natural processes. Examples of such sources include the sun, wind, geothermal energy, biomass, and moving water."³ Clean, hydroelectric generation typically makes up almost half of SWP power resources.

Joint Development Agreements

In 1966, DWR contracted with LADWP for the joint development of the Castaic Power Plant. Although part of the SWP system, the Castaic Power Plant is operated by LADWP, and electrically connected to their system at the Sylmar Substation. SWP receives capacity and energy based upon LADWP's weekly water schedules.

Contractual Arrangements

DWR takes delivery within California for energy through long-, medium-, and short-term agreements with marketers and utilities which includes the following:

³ Refer to <http://www.energy.ca.gov/2005publications/CEC-300-2005-010/CEC-300-2005-010-FS.PDF>



- All hydroelectric output from the run-of-river 210 MW Pine Flat Power Plant, owned and operated by KRCD.
- 30 MW from five small hydroelectric plants owned and operated by MWD.⁴
- A 1988 Coordination Agreement, which allows DWR to purchase surplus energy from MWD's Colorado River Aqueduct system.
- 200 MW of off-peak energy through 2015 from a market contract sourced primarily from natural gas.
- DWR receives energy from the Reid Gardner coal-fired generation facility in Moapa, Nevada. DWR receives up to 235 MW from Reid Gardner Unit No. 4. This contract will expire in July 2013 and will not be renewed. Upon contract expiration, DWR will replace this energy with a combination of cleaner, more efficient resources. DWR will continue improvements to the SWP system resources and strategies (as described in this report).
- DWR will receive 183,220 MWh of renewable energy annually through 2016 from Alameda Municipal Power. This consists of 28.3 MW geothermal generation and 5.3 MW from landfill gas.
- In late February, DWR signed a 20-year contract to purchase solar electricity that represents a very big step forward in its efforts to reduce fossil fuel use. By the end of 2014, DWR will begin purchasing about 120,000 kWh per year under this contract from new solar systems that will be built at 2 sites in Kern County.
- The SWP relies upon market contracts and exchange agreements with energy from unspecified sources. The emissions from these contracts and agreements are derived from emissions assigned to California's mix of energy resources.

The State Water Project Water Energy Portfolio – Calendar Years 2008 through 2012

Averaged over the past five years (2008 through 2012), hydroelectric generation comprised 51 percent of SWP power resources. Market based purchases and exchanges, and Reid Gardner Unit No. 4 equaled 36 percent and 13 percent of the SWP power purchase portfolio, respectively. The SWP's generation portfolio for calendar years 2008-2012, including projection for 2013 and 2016, is summarized below.⁵

⁴ Located at Lake Mathews, Foothill Feeder, San Dimas, Yorba Linda, and Greg Avenue in the Los Angeles area

⁵ SWP energy data is subject to change, based upon the financial settlements process, as well as the validation necessary for publication in Bulletin 132. This verification process may continue for one or more years, until final publication in the Bulletin.

Table 2. SWP 2008-2012 Energy Portfolio⁶

SWP Generation Resources (GWh)	Year						
	2008	2009	2010	2011	2012	2013	2014
Hydrogeneration							
Alamo Power Plant	66	56	80	107	30	51	78
Castaic Power Plant*	582	585	447	416	615	690	634
Devil Canyon Power Plant	686	561	1,002	1,306	952	986	805
Mojave Siphon Power Plant	42	32	62	85	60	84	73
Pine Flat*	246	270	514	795	247	245	244
Gianelli Pumping-Generating Plant	140	56	87	74	143	138	110
Hyatt - Thermalito Power Plant Complex	990	1,451	1,546	2,210	1,638	1,851	1,865
Warne Power Plant	316	284	269	243	359	400	371
Small Hydro*	147	102	100	145	119	139	127
Total	3,215	3,397	4,107	5,381	4,163	4,583	4,309
Other Renewable							
Alameda Municipal Power Agreement**	-	-	-	-	39	181	194
Total	-	-	-	-	39	181	194
Market Purchase							
CAISO (Unspecified Energy)	3,715	2,983	3,369	2,294	2,103	2,550	2,782
Total	3,715	2,983	3,369	2,294	2,103	2,550	2,782
Fossil Fuel Generation							
Lodi Energy Center* (Natural Gas)	-	-	-	-	40	510	459
Reid Gardner Unit No.4 Imports* (Coal)	1,134	1,175	819	850	1,036	420	-
Total	1,134	1,175	819	850	1,076	930	459
Total Resources	8,064	7,555	8,295	8,525	7,381	8,245	7,743
Sales (Surplus Energy)	2,335	1,476	1,784	0	0	0	0
Total (Net) Resources	5,729	6,079	6,511	8,525	7,381	8,245	7,743

*Off Aqueduct

**Represents forecast from the Scheduling Coordinator for Alameda Municipal Power.

Supply and Demand							
Project Gigawatt Hours	2008	2009	2010	2011	2012	2013	2014
SWP Pumping Plant Load	5,709	5,445	7,191	8,511	7,371	8,245	7,743
SWP Power Plant Generation	2,240	2,441	3,046	4,025	3,182	3,509	3,303

⁶ Minor variances in subtotals or totals are due to the result of rounding. GWh totals include line loss factors and station service.



CO₂ Emissions Summary and Accounting Methodology

DWR reported CO₂ emissions for the SWP power purchase portfolio to the CCAR for years 2008 through 2012 and to TCR and California CARB, as summarized below.

Table 3. SWP Annual Energy Portfolio CO₂ Emissions

State Water Project CO ₂ Emissions (Million Metric Tonnes Carbon Dioxide)					
Source	2008	2009	2010	2011	2012
Reid Gardner Unit 4	1.0	1.0	0.8	0.9	1.2
Lodi Energy Center					0.01
Purchases (Unspecified Energy)	1.4	1	1.1	1	0.9
Gross Emissions	2.4	2.0	1.9	1.9	2.1
Surplus Sales	0.8	0.4	0.4	0	0
Net Emissions	1.6	1.6	1.5	1.9	2.1

Through reporting year 2009, DWR applied emissions factors and guidelines consistent with the *California Climate Action Registry (CCAR) General Reporting Protocol* and the *Power/Utility Protocol*. These protocols integrate data sources and methodology from the Environmental Protection Agency (EPA), the Energy Information Administration (EIA), and the Federal Energy Regulatory Commission. DWR transitioned to the new, nationally based registry by joining TCR in February 2010. For the 2010 and later reporting years, DWR reported GHG emissions to the TCR applying methodology and emissions factors consistent with TCR's *General Reporting Protocol* and the *Electric Power Sector (EPS) Protocol*. DWR selected an independent verification services for its 2010 and 2011 emissions reports to TCR.

Under existing protocols, hydroelectric, nuclear, and renewable energy are reported as having zero carbon emissions. For the purchases from unspecified sources default emissions rates are used.

The Reid Gardner Unit 4 CO₂ emissions rate is calculated by retrieving data from the EPA Clean Air Markets Division database.⁷ The rate is calculated based upon the energy DWR imports into California to serve SWP pump load demand.

⁷ NV Energy reports emissions to the EPA CAMD on a quarterly basis, based upon direct measurements acquired through its continuous emissions monitoring (CEM) system. The EPA publishes its CAMD emissions data three months after the fact.



Investment in Low Emissions Technologies - The Lodi Energy Center

CO₂ emissions from electric power generation are tied to efficiency factors associated with converting fossil fuels into electricity, and the type of fuel used. In a typical power plant, only 30 percent of the energy is actually converted into electricity. Improvements in generation efficiency by replacing traditional power generators with more efficient technologies can result in lower CO₂ emissions. For example, emissions factor associated with natural gas generation is about half compared to coal-fired generation. Higher efficiency of a combined cycle natural gas generation plant further reduces the emission factor.

In 2009, DWR finalized its participation in the construction of a new, state-of-the-art combined-cycle natural gas plant. The new facility uses advanced emission control technology, is highly efficient, and replaces a portion of the SWP power needs now served by coal fired generation. LEC is a 296 MW gas-fired power plant located near Lodi, California, and has one of the lowest greenhouse gas emissions rates in the state, and possibly the nation. DWR has contract rights for approximately one-third of the output from LEC (the DWR will receive approximately 100 MW of the plant's output). Groundbreaking for construction of the plant occurred in July 2010. Construction of the LEC natural gas power plant was completed and the plant started operation in late November 2012.

SWP Operational Flexibility and Energy Efficiency Programs

Hydroelectric power plants avoid increased releases of GHGs. Consistent with AB 32, achieving high levels of efficiency of pumps and generators is one of many strategies DWR engages in to help California meet the GHG emission reduction goals and stabilize the costs of delivering water, and provide energy alternatives to fossil fuel based energy resources.

DWR replaced half the pumps at the Edmonston Pumping Plant several years ago, which resulted in significant energy savings and 48,000 metric tons annual reduction in CO₂ emissions. DWR previously indicated feasibility studies were underway for energy efficiency upgrades to the remainder of the Edmonston pumps and work would begin in 2013, but that schedule has been changed; DWR is evaluating the feasibility and the work would occur from 2018 to 2020. The decision whether to proceed is awaiting flow measurement results, but new equipment is needed to obtain accurate measurements and it can only be installed when the pumps are shut down for maintenance. Currently, DWR expects a shut-down some time before the end of the year, but this remains uncertain.



Table 4 illustrates the cumulative energy savings and fossil fuel emissions equivalents associated with the energy efficiency improvements from 2003 through 2020. This table also reflects the emission reduction due to energy efficiency from 2007 through 2020.

**Table 4. SWP Energy Efficiency and Emissions Reductions
Years 2003 – 2020**

Energy Efficiency Program	Cumulative Energy Savings (MWH)		Emissions Reductions (Metric Tons CO ₂)		Emissions Avoided
	Hyatt Generation	Edmonston Pumping	Hyatt Generation	Edmonston Pumping	Automobile Equivalents
Years					
2003-2007	306,949	5,951	84,108	1,631	15,703
2008-2020	1,721,443	773,202	471,698	211,867	125,195
Total (2003-2020)	2,028,392	779,153	555,806	213,498	140,898
CUMULATIVE TOTAL	2,807 gigawatt hours		0.77 million metric tonnes CO₂		140,898 automobiles

Sites Reservoir Storage Projects

DWR is conducting a research on how to provide water supplies in average and dry years for urban, agricultural and environmental purposes using clean hydroelectric resources to enhance the inherent flexibility of the SWP.⁸ Pump-back operations use water in excess of what is necessary to meet downstream flow requirements. The water is pumped back into a reservoir during off-peak hours, and then released during on-peak hours when power is in demand. A classic example of these types of operations is the SWP Oroville Facilities power operations, whose releases are made for several purposes, including entitlements, water quality, and in-stream flow for the Feather River. However, the pump back operations have not been feasible for the last several years due to requirements for cooler water temperature releases for fish, and other environmental requirements.

Sites Reservoir, a proposed off-stream project with a capacity of up to 1.8 million acre-feet would be filled primarily by pumped diversions from the Sacramento River. Water would be diverted into the reservoir during peak flow periods in winter months. To minimize potential impacts of existing diversions on Sacramento River fisheries, water would be released from Sites back into valley conveyance systems in exchange for water that would otherwise have been diverted from the Sacramento River. The undiverted summer water could become available for other downstream uses in the

⁸ DWR and the CALFED Bay-Delta Program (CALFED) funded five surface storage investigations to study increasing Delta outflows during critical times, improving flood control, enhancing groundwater recharge, contributing to the Environmental Water Account, and, improving the operational flexibility for existing facilities, such as Shasta Reservoir.



Bay-Delta. By providing additional storage and operational benefits, Sites Reservoir would be a critical component of an integrated water management and water development program for the Sacramento Valley.

Second Unit at DWR's Alamo Power Plant

In 2010, DWR completed a power planning study of adding a second 12 MW generation unit to the existing 18 MW small hydro energy recovery unit at Alamo. The study results recommended proceeding with the preliminary design and initiating the permitting process for adding the proposed unit. SWP management is reviewing staff recommendations. If the project proceeds, the tentative online date would be 2016.

Edmonston Pumping Plant Unit Replacements

A DWR power planning study provided input to DWR's Division of Engineering on the energy efficiency gains, carbon reductions, and reduced need for grid services that would result from replacement units, which would total approximately 10 MW of reduced pump rating. DWR is currently assessing this project through a Value Engineering Study.

Future Renewable Request for Proposals (RFP)

In January 2012, DWR issued an RFP for procurement of 180,000 MWh per year of renewable energy and received over 80 proposals. Using the experience gained from the RFP and the subsequent contract negotiations, DWR expects that, around the end of 2013, it will issue another RFP to purchase additional renewable electricity.

Small Hydro Investigation

A DWR power planning study is currently underway examining 12 sites, which total approximately 33 MW (ranging from 0.5 to 12 MW), within the SWP that may have the potential for small hydro installations. The sites will be analyzed based on capability for energy production, current energy and CAISO market outlook, and the renewable energy credit component. If any of the projects proceed, the tentative online date for the initial projects would be 2018.

Micro Hydro Investigation

DWR is considering an investigation into whether Micro Hydro generation could be installed on outlet structures of the California Aqueduct. This investigation would follow the conclusion of the small hydro investigation as discussed above.



Reducing Fossil Fuel Use and Increasing Energy Efficiency in SWP Facilities

In December 2005, Governor Schwarzenegger signed Executive Order S-20-04, creating a Green Building Action Plan. The order mandates reducing grid-based energy purchases for State-owned buildings by 20 percent by 2015. To achieve this goal, all new and renovated State-owned facilities must be designed, constructed, and operated as Leadership in Energy and Environmental Design (LEED) Silver or higher certified buildings; and the most appropriate financing and project delivery mechanisms must be used.

The U.S. Green Building Council (USGBC) is a 501(c)(3) nonprofit organization that developed the standard for green building and development. USGBC's LEED Green Building Rating System promotes reliable building design and performance measurement systems.⁹ LEED certification assigns progressive levels (Certified, Silver, Gold and Platinum) and requires independent, third-party verification for each building project.

DWR is committed to designing and constructing the Rio Vista Estuarine Research Station (RVERS), a new Joint Operations Center (JOC), and the SWP Pearblossom Administration Building to meet the requirements for LEED Silver and Gold certification. The RVERS complex, located in Solano County, includes three buildings occupying 105,527 square feet.

An Environmental Impact Statement and Report is currently underway for the JOC. This complex will include three to four buildings, occupying approximately 200,000 square feet in Sacramento County.

DWR has completed design and construction of its first Leadership in Energy and Environmental Design-New Construction (LEED-NC) project at its Pearblossom Operations and Maintenance Center, Southern Field Division. DWR is pursuing a LEED-NC Gold Level Certification for this new 20,000 square foot administrative office building. The Center was built using strategies for improving performance across all key metrics: energy savings, water efficiency, improved indoor environmental quality, stewardship of resources and sensitivity to impacts. The design includes a 30 kW solar system to power the facility.

⁹ http://www.usgbc.org/Docs/LEEDdocs/LEED_RS_v2-1.pdf



Conclusion

DWR will continue its role as the State's third largest generator of clean hydropower. DWR is currently investigating ownership interest and contractual agreements to not only replace its coal generating resources, but also to reduce its overall dependency on fossil fuels. This can be accomplished with technologies such as combined-cycle generators and combined heat and power systems to replace the coal-based energy with a combination of cleaner, more efficient resources, improvements to the SWP system, and renewable energy resources. DWR's membership in the CCAR, TCR and participating in AB32 mandated reporting regulations provide the vehicle for DWR to track and report its CO₂ and GHG emissions, evaluate its progress in meeting and exceeding California's GHG emissions reductions goals, and influence the role DWR will play in mitigating the negative effects of climate change in California.