

DEPARTMENT OF WATER RESOURCES

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TO: Distribution List

Attached is the first semi-annual report to the Chairs of the Senate and Assembly fiscal committees on the Department of Water Resources' (DWR) energy use and purchasing activities. This is a supplemental report required by the 2007 Budget Act (Item 3860-001-0001), dated August 2007.

The report discusses the energy related activities of DWR's State Water Project, the California Energy Resources Scheduling Division, and the Office of Water Use Efficiency and Transfers activities related to its statutory and regulatory authority and disbursement of bond funds.

If you have any questions, please contact me at (916) 653-7007 or your staff may contact Veronica Hicks, Chief of DWR's State Water Project Power and Risk Office at (916) 574-1295.

Sincerely,

A handwritten signature in dark ink, appearing to read "Lester A. Snow", with a long horizontal flourish extending to the right.

Lester A. Snow
Director

Attachments

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The California Department of Water Resources Report to the California State Legislature Covering its Energy Use and Purchasing Activities

The Department of Water Resources (DWR) is pleased to submit its January 2008 Semi-Annual Report to the Legislature covering its Energy Use and Purchasing activities. This report addresses the actions DWR is taking to:

- Phase out use of coal power supplied from its participation agreement for the partial output of Reid Gardner Plant Unit No. 4, and to replace it with other less carbon-intensive energy resources;
- Reduce fossil fuel use in its California Energy Resources Scheduling (CERS) division contracts and to replace that fuel with less polluting energy resources;
- Reduce fossil fuel use and increase energy efficiency in State Water Project (SWP) operations (including the amount and sources of electricity used to convey water); and
- Reduce energy and water consumption through DWR's statutory and regulatory authority and through disbursement of bond funds.

The SWP generates clean hydroelectric power for 40 percent to 60 percent of its energy resource needs, depending on precipitation and water demands. Hydropower falls under the definition of renewable energy, which is the "energy drawn from a source that is infinite or is replenished through natural processes. Such sources include the sun, wind, and heat from the earth's core, biomass, and moving water."¹ As such, hydroelectric power associated with operating the SWP is assigned zero carbon emissions under the California Climate Action Registry (CCAR) protocols.

¹ <http://www.energy.ca.gov/2005publications/CEC-300-2005-010/CEC-300-2005-010-FS.PDF>



Executive Summary

This report includes information on DWR's accomplishments and future expectations, as well as a review of the SWP power portfolio associated with conveying water throughout California. In summary:

- DWR's contract for output from Unit 4 of the Reid Gardner coal power plant will expire in mid-2013 and be replaced with less carbon intensive energy supplies, including renewable energy.
- DWR is developing specific renewable energy procurement goals and will report annually to the Legislature on its progress.
- The SWP Demand Response program is a contractual agreement to offer up to 200 megawatts (MW) of hydroelectric pump load drop for up to 24 hours per month during California's summer peak load period. This reduces the overall carbon emissions in California by deferring the need to schedule and call upon thermal generators to respond to demand.
- As of 2007, the SWP's Energy Efficiency Improvements programs realized a cumulative energy savings exceeding 310 Gigawatt hours, and carbon dioxide (CO₂) emissions reductions of 88 thousand metric tons (MT), as a result of successful refurbishment of its hydroelectric pumps and generators at key SWP plant facilities.
- DWR anticipates meeting the AB 32 goal of reducing its carbon emissions to 1990 levels over six years earlier than the mandated target date of 2020.
- DWR is actively investigating the viability of investment in new state-of-the-art combined-cycle natural gas plants and renewable energy sources.
- DWR joined the CCAR in June 2007, to gain a clear understanding of its current and future carbon footprint, and participate in a standardized program that will contribute to DWR's future analysis of its greenhouse gas (GHG) reductions strategies.
- California Energy Resources Scheduling (CERS) continues to provide electricity that meets 19 percent of investor owned utilities (IOU) customers' electricity demands. For 2008, the energy sources under the CERS contracts are anticipated to be from 1 percent renewable generation, 48 percent natural gas generation and 51 percent from unspecified sources.



The Department of Water Resources Operations Overview

DWR is an agency of the State of California, headquartered in Sacramento, responsible for monitoring, conserving, and developing California's water resources, providing public safety and preventing property damage related to water resources. The Department's mission mandates that all projects undertaken by DWR shall benefit the State's people, and protect, restore, and enhance natural ecosystems and human environments.

Federal and State legislation and policy goals collectively aim to reduce carbon emissions arising from human activity and to increase use of renewable sources of power. It is DWR's intent to continue improving upon its policies to promote cost-effective measures to mitigate and offset the GHG emissions associated with DWR's statewide water management directives. DWR will continue to operate the SWP to support these objectives, while meeting its primary mission, and portfolio objectives. In the process of sustaining a dependable, cost-effective, and diverse energy portfolio mix to ensure California's water and energy needs, DWR's near- and long-term strategies are to:

- Achieve a diverse power portfolio that includes clean energy and renewable generation;
- Interact effectively with California's utility industry, and regional, State, and local governmental entities to identify and implement regulatory, and market based initiatives to reduce GHG emissions;
- Continue implementing long term energy efficiency improvements at SWP facilities; and
- Research market and regulatory initiatives at national, regional, and statewide levels (for example, "cap and trade" proposals, renewable energy credits, and carbon tax initiatives) to gain insight on the potential impacts to DWR's mission and input to DWR's overall strategies for reducing its GHG emissions.

State Water Project

A primary responsibility of DWR is the construction, operation and maintenance of the SWP. The SWP is the largest State-owned, multi-purpose water project in the country and its operations are critical to the resources and economy of California. The SWP's system spans nearly the entire State, from Lake Oroville in Northern California to Pyramid, Castaic, Silverwood, and Perris reservoirs in Southern California. SWP delivers an average of 3.3 million acre-feet of water per year to 29 public agency water contractors throughout California. Approximately 40 percent of the deliveries are used to irrigate 750 thousand acres of farmland. The remaining deliveries serve the water needs for over 25 million Californians.



The SWP is the third largest generator of clean hydropower in California. Its water conveyance system includes 33 water storage facilities, 700 miles of canals and pipe lines, 20 pumping plants, 4 pumping-generating plants, and 5 hydroelectric power plants. SWP also acquires energy from two off-aqueduct hydroelectric power plants, and an out of state thermal power plant to serve the SWP's pump load requirements. The SWP's power generation sources have over 1,900 MW capacity, and generate an average of 5 billion kilowatt-hours (kWh) of energy each year. The SWP's pumping facilities have capacity of approximately 2,600 MW, and consume an average of 9 billion kWh per year.²

A continuous balance is maintained between resources and demand on the SWP's electrical system through self-generation, load management, power exchanges, and purchase and sales transactions with other entities. The SWP's generation resources and pumping loads are integrated through transmission service purchased from Pacific Gas and Electric Company and Southern California Edison Company. To the extent SWP requires transmission not covered under existing contracts, it must take service under the California Independent System Operator Corporation's (CAISO's) Tariff.

SWP's aqueducts and reservoirs are designed to provide water storage that allows some flexibility for the SWP to pump during hours of lower system wide power demand and generate during hours of higher system wide power demand. However, this flexibility is constrained by water delivery obligations and environmental and regulatory requirements. In addition to the vital role of the SWP as California's water delivery system and the functions DWR performs in managing floods, the SWP provides benefits to the CAISO wholesale power grid, including consuming off-peak resources, and contributing clean hydroelectric generation during peak hours. SWP hydroelectric generation replaces energy provided by less efficient, carbon emission producing generators during peak hours.

DWR also provides grid participants with a zero-emissions energy product through a Demand Response option of dropping pump load up to 200 MW during the summer. This service effectively reduces GHG emissions by decreasing the amount of peak generation that would be necessary and likely served by inefficient, high carbon emitting resources. SWP is California's largest individual demand response provider.

DWR is continually evaluating its operational strategies and energy portfolio to increase its low carbon emitting energy resources to complement SWP's ability to deliver water using environmentally sensitive and sustainable energy resources.

² DWR Bulletin 132-05 Bulletin 132, *Management of the California State Water Project*, page 153, <http://www.swpao.water.ca.gov/publications/bulletin/05/Bulletin132-05.pdf>



State Water Project Energy Portfolio

Table 1 summarizes the most recent statistics on the SWP's energy portfolio for calendar year 2006.³

Table 1. SWP 2006 Energy Portfolio

SWP 2006 Energy Portfolio	
Source	GWh
Oroville (Hyatt-Thermalito)	3,631
Gianelli	165
Warne	293
Devil Canyon	1,434
Castaic	442
Alamo	88
Mojave Siphon	95
Pine Flat	723
Small Hydro	154
<i>SWP Hydrogeneration</i>	7,025
Exchange Agreements	367
Market Purchases	4,335
<i>Purchases & Exchanges</i>	4,702
Reid Gardner Unit No. 4	1,349
<i>Non-Hydro Imports</i>	1,349
Grand Total	13,076

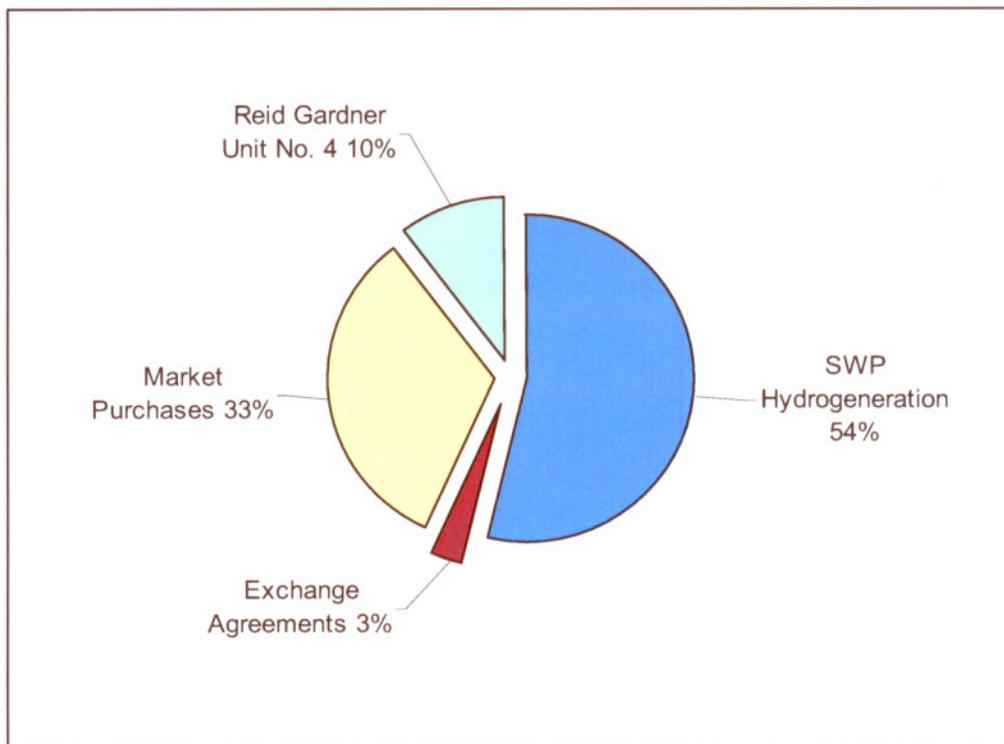
³ The data is subject to change, based upon the ongoing validation process, in preparation for publication in Bulletin 132-06.



The State Water Project's Energy Mix

Figure 1 depicts the relative proportion of each resource in the SWP's energy portfolio for 2006.

Figure 1. SWP 2006 Energy Resources



Phasing Out Reid Gardner Plant – Acquiring Less Carbon-Intensive Energy

The electric power needed to operate the SWP comes from its own and jointly developed hydroelectric facilities, long-term and short-term purchase agreements, and a 30 year agreement with Nevada Power Company (NPC). Since July 25, 1983, DWR has received up to 235 MW from Unit 4, one of four units at the Reid Gardner coal-fired generation facility located in Moapa, Nevada. In May 2007, DWR formally notified the plant's owner that DWR will not renew this agreement, which expires on July 25, 2013. DWR intends to replace this coal based energy with a combination of cleaner, more efficient resources, improvements to the SWP system and renewable energy resources.

Based upon the data enumerated in Table 1, estimates for the CO₂ emissions associated with the SWP 2006 portfolio are summarized in Table 2, using the emissions factors and guidelines cited in the CCAR's General Reporting Protocol. Consistent with the CCAR protocol (which also integrates data sources from three federal agencies: the



Environmental Protection Agency (EPA), the Energy Information Administration (EIA), and the Federal Energy Regulatory Commission (FERC)), hydroelectric, nuclear, and renewable energy resources are assigned zero carbon emissions factors. SWP's purchases and exchanges from unspecified sources are estimated using the published emissions rates of counterparties who filed with the CCAR in 2007,⁴ and the CCAR recommended Western Electricity Coordinating Council (WECC) regional default factor for CO₂ Emissions in California.⁵ Reid Gardner Unit No. 4 CO₂ emissions were retrieved from the EPA Clean Air Markets Division (CAMD) database.⁶ This data was used to ascertain the level of emissions for the actual energy imported into California by DWR from Reid Gardner Unit No. 4.

Table 2. SWP Energy Portfolio CO₂ Emissions in 2006

State Water Project CO₂ Emissions in 2006		
Source	Average Annual Emissions Rate (Metric Tons CO₂/MWh)	SWP Annual Emissions (Million Metric Tons CO₂)
2006 Reid Gardner Unit 4	1.30	1.754
Market Exchanges	0.29	0.106
Market Purchases	0.37	1.621
	Total	3.481

Efficient Energy Technology -- Non-Renewable Resources Generation

CO₂ emissions from electric power generation are influenced by the efficiency factors associated with converting fossil fuels into electricity, as well as 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. DWR is currently investigating ownership interest and contractual agreements in technologies such as combined-cycle generators and combined heat and power systems. Energy from combined cycle gas turbines are rated for emissions that average 800 pounds CO₂ per megawatt hour (MWh).

⁴ With the exception of one counterparty, whose emission rate reported to the CCAR was only available for 2005.

⁵ Emissions & Generation Resource Integrated Database (eGRID), eGRID2006 Version 2.1, April 2007 (Year 2004 data).

⁶ NPC reports emissions to the EPA CAMD on a quarterly basis, based upon direct measurements acquired through its continuous emissions monitoring (CEM) system.



State Water Project System Enhancements

In 2006, DWR completed the construction of a new reservoir known as the Tehachapi East Afterbay. The Afterbay provides water storage for the SWP's "Valley String" (Dos Amigos, Buena Vista, Teerink, Chrisman, and A.D. Edmonston pumping plants). The facility consists of a 910 acre-foot reservoir, inlet channel, outlet channel, bypass, and appurtenant structures.

The new reservoir enables DWR to reduce pumping operations of the Valley String during peak energy demand periods and to provide energy ancillary services. The Afterbay provides additional storage capacity by allowing a seasonal reduction in on-peak load which simultaneously reduces market reliance on poorer quality thermal units that emit higher amounts of GHGs during periods associated with peak energy demand.

DWR is investigating other opportunities to construct additional features that will increase the flexibility of the SWP by decreasing pumpload and increasing the availability of its hydro resources during peak hours. DWR is also investigating the feasibility of small hydroelectric projects within its system, including projects that were not feasible or economic in the past. Currently, DWR is preparing design drawings for installation of an additional small hydrogeneration unit at its Alamo plant.

Reducing Fossil Fuel Use and Increasing Energy Efficiency in SWP Operations

Comparing hydropower to fossil fuel plants, hydroelectric power plants avoid additional releases of GHGs, making a substantial contribution to diminishing emissions. Consistent with the spirit of AB 32, achieving high levels of efficiency is one of the key strategies DWR applies to stabilize the costs of delivering water, and to help California meet the GHG emission reduction goals.

DWR invests substantial resources to conduct engineering feasibility and design studies to improve the overall water to energy conversion of all SWP equipment and facilities. DWR's improvement programs include pump and turbine replacements and refurbishments using state-of-the-art design and construction methods to bring SWP's hydroelectric units to first in class levels of energy efficiency. The A.D. Edmonston Pumping Plant and Edward Hyatt Powerplant are two SWP facilities where major energy efficiency projects have been undertaken.

A. D. Edmonston Pumping Plant is the largest plant in the SWP, with 14 pumps, each rated at 80 thousand horsepower, pumping water from the California Aqueduct over Tehachapi Mountains into Southern California. Based upon the SWP's metered data, averaged over years 2003 through 2006, with increases in efficiencies measured against each units' original efficiency levels, DWR's refurbishment of Edmonston Unit No. 6 reduces the SWP pumpload requirement by over 10,200 MWh annually. Future upgrades to Edmonston Units No. 4, 6, and 8 will reduce the SWP pumpload requirement by an additional 30,600 MWh annually.



The SWP's largest generation resource is the Edward Hyatt Powerplant, an underground, hydroelectric, pumping-generating facility constructed in the bedrock below Lake Oroville. DWR developed the Hyatt Powerplant modernization program to increase unit efficiency in the generation mode and reduce power consumption in the pump mode. All six of Hyatt's units have been upgraded using state-of-the-art model design technologies, manufacturing techniques, and materials. DWR's refurbishment of Hyatt Unit Nos. 1 through 6 represents an annual energy savings of over 130 thousand MWh annually.

Based upon the SWP's estimated CO₂ emissions associated with the SWP Power Purchase Portfolio, DWR anticipates that the two energy efficiency projects will reduce GHG emissions by over 700 thousand metric tons of CO₂ between 2003 and 2020 as shown in Table 3.

**Table 3. SWP Energy Efficiency and Emissions Reductions
Years 2003 – 2020**

Energy Efficiency Program	Cumulative Energy Savings (MWh)		Cumulative Emissions Reductions (Metric Tons CO ₂)		Emissions Savings
	Hyatt Generation	Edmonston Pumping	Hyatt Generation	Edmonston Pumping	
Years					Automobile Equivalents
2003-2007	306,949	5,951	86,410	1,675	16,133
2008-2020	1,721,443	456,950	484,606	128,637	112,315
Total by Plant	2,028,392	462,901	571,016	130,312	128,448
CUMULATIVE TOTAL	2,491,293 MWh		701,328 MT CO₂		128,448 Autos

Reducing Fossil Fuel Use in the California Energy Resources Scheduling (CERS) Contracts – Replacement with Less Polluting Energy Resources

DWR created the CERS Division during California's 2000-2001 energy crisis in response to calls by the Governor and the Legislature for DWR to purchase power for California's Investor Owned Utilities (IOU's). In 2001, the CERS Division of the DWR assembled a portfolio of long-term energy contracts that achieved the directive of the Governor and Legislature to provide reliable electric service at the lowest-possible price. On behalf of the State, DWR entered into power contracts for 20 percent of the power used by IOU's. These power contracts provided the guaranteed revenue that allowed for the financing and construction of over 5,000 MW of state-of-the-art natural gas-fired power plants. These cleaner, more fuel efficient natural gas-fired power plants have significantly reduced reliance on older, less-efficient plants in the State.



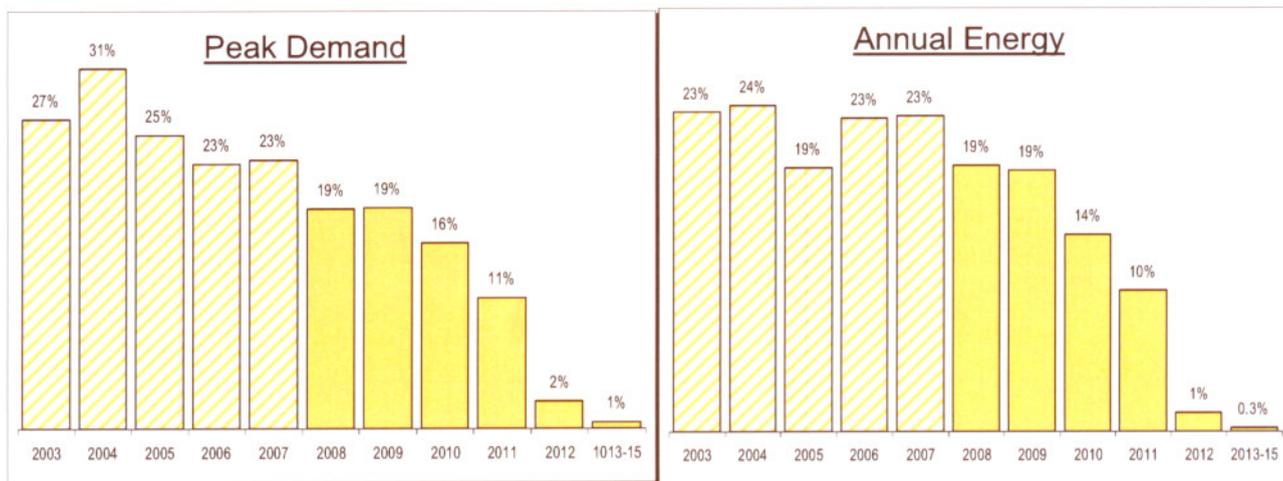
DWR originally entered into contracts with 28 counterparties to provide 56 energy products. Six of the agreements were for renewable power, and included two contracts totaling 31 MW for biomass power, one 25 MW contract for geothermal power, and three contracts for a total of 174 MW of wind power.

The contracts also provided a guaranteed source of revenue that allowed DWR's counterparties to secure financing for the construction of over 5,000 MW of new energy-efficient gas-fired power plants that were built between 2001 and 2003. These new generation plants displaced power from older, dirtier, less efficient fossil generation in the State and have contributed to a reduction in carbon emissions of approximately 1.66 million tons annually.

The Legislature required DWR to consider a number of factors when entering into contracts for power, including an intent to achieve an overall portfolio of energy contracts offering reliable service at the lowest possible price to secure as much power under contract as possible from firm and non-firm renewable energy resources. Reliable, reasonably-priced electricity is essential to the safety, health and well-being of the people of California. As opportunities for contract amendments arise, DWR strongly encourages energy portfolio options that contribute increasing percentages of renewable energy resources to its energy mix portfolio, consistent with the Legislature's intent.

Nearly seven years after the energy crisis, DWR continues to provide electricity that meets nearly 20 percent of the IOU's customers' electricity demands. Twenty-six contracts remain in effect with an estimated cost of \$12.5 billion. By 2012, only four contracts will remain providing less than one percent of the IOU's customers' demand. The last contract expires in 2015, as illustrated in Figure 2.

Figure 2. CERS Contracts as a Percent of IOU Peak Capacity & Annual Energy Demand





The Generation Mix of the CERS Portfolio

For 2007, the estimated mix of generation from the CERS portfolio was:

Table 4. CERS Generation Energy Portfolio in 2007

Source	Capacity (MW)	Energy (GWh)
Wind	64	429
Natural Gas	7,782	35,778
Non-Specific	2,719	18,790
Total	10,565	54,997

While most of the generation in the DWR portfolio comes from newly constructed, energy efficient, natural gas-fired plants, some of the DWR contracts are with power marketers who do not own any generation, or with counterparties that have the option to provide power from market sources when it is cheaper to do so. Roughly 34 percent of the power provided comes from non-specific market sources which can not be traced to a specific generator.

For 2008, California Energy Resources Scheduling (CERS) division contracts are forecasted to provide 19 percent of the state's investor-owned utilities' annual demand for electricity. Electricity from CERS contracts with renewable energy resources will provide 1 percent of the CERS total while electricity generated from natural gas facilities is estimated to provide 48 percent. The remaining 51 percent will come from the general market where the source of the generation is not known. Between now and when the CERS contracts end in 2015, DWR will have the limited opportunity to re-negotiate the contracts to increase the amount of electricity derived from renewable energy resources.

Role in Statewide Energy Supply

DWR's authority to enter into new contracts ended in 2002. Its temporary role in providing power limits its ability to renegotiate contracts to bring **new** renewable energy projects on-line. Developers of new renewable energy projects need long-term contracts in order to get financing for the projects.

For DWR to replace fossil generation in the portfolio of contracts with renewable energy, and still limit its involvement in energy markets to no longer than 2015, would require DWR to compete against the California IOUs for power from existing renewable energy projects. This would only exacerbate the problem the IOUs are currently facing in meeting the State's renewable portfolio standard goal.

Summary

Due to the unique circumstances of the CERS contracts and limitations on contract term-renegotiation, it is unlikely that fossil fuel use in the CERS portfolio will be appreciably reduced.



Reducing Energy Use and Water Consumption – DWR's Authority Over and Disbursement of Bond Funds

The California Water Plan Update 2005⁷ (California Water Plan) estimates that by accelerating efforts for water use reductions by 2015, a cumulative reduction of GHG emissions of 30 million tons may be achieved by 2030.⁸ The Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses, and identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and projects to address the State's water needs.

The California Water Plan recommended that DWR's Integrated Regional Water Management (IRWM) Grant Program promote and practice integrated regional water management to ensure sustainable and reliable water uses and supplies, better water quality and environmental stewardship, efficient urban development while protecting agriculture, and a strong economy through a competitive funding. Grant funding for the IRWM is authorized through Propositions 50 and 84.⁹ DWR water management grant programs require Urban Water Management Plans that detail applicants' implementation of water use efficiency measures.

DWR has authority to develop recommendations to improve water use efficiency, provide financial incentives for implementing water use efficiency programs, and evaluate statewide implementation of water use efficiency measures. DWR administers water use efficiency grant programs through a number of bond measures, some of which are enumerated below.

Proposition 50, the *Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002*, Chapter 8, bond funding is jointly administered by DWR and the State Water Resources Control Board (SWRCB).¹⁰ On August 1, 2007, DWR and the SWRCB received 28 applications for Proposition 50, IRWM, Round 2 Implementation Grants proposals for consideration under the \$35 million grant solicitation process. DWR required that applicants evaluate the energy impacts or benefits of their proposals, in light of the important relationship between water and energy use.

⁷ CDWR Bulletin 160-05.

⁸ Water use efficiency strategies can reduce annual urban and agricultural water use by 1.1 to 2.3 million acre-feet and 0.5 to 2.0 million acre-feet respectively by 2030.

⁹ For further details, refer to The California Water Plan Update 2005 Bulletin 160-05, http://www.des.water.ca.gov/mitigation_restoration_branch/rpmi_section/projects/deir/7.16percent20Energy.pdf

¹⁰ Refer to Division 26.5. Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 for additional information, http://www.grantsloans.water.ca.gov/grants/leginfo/legis_Prop50.cfm



This information was critical in determining selection criteria for the 17 applications deemed complete and eligible for review. In turn, eight applicants were invited to submit a Step 2 IRWM grant application. In December 2007, DWR and SWRCB held informational workshops for the applicants. Proposition 50, IRWM Round 2 Implementation Grant, Step 2 applications were due on January 15, 2008. The contract start date is July 1, 2008.

Proposition 84, the *Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Act of 2006* includes \$1 billion in funding for integrated regional water management grants, administered exclusively by DWR.¹¹ DWR's fundamental strategy in orchestrating the distribution of \$1 billion dollars in Proposition 84 funding is to encourage regions in diversifying their water portfolios for greater resilience in the face of new and uncertain climate extremes. The IRWM focuses on water supply planning on the regional and local level, where flexibility and innovation most significant. DWR recently completed a first series of statewide workshops, with an emphasis upon energy use and GHG emissions as an integral factor in developing regional plans. After considering public input, DWR is preparing a detailed set of program guidelines that will be introduced in 2008.

Proposition 1E authorizes a \$4.09 billion dollar bond to rebuild and repair California's most vulnerable flood control structure to mitigate flood-related disasters, including levee failures, flash floods, and mudslides and to protect California's drinking water supply system by rebuilding vulnerable delta levees. DWR launched *FloodSafe California* as the strategic initiative to maximize Proposition 1E and 84 bond funds to reduce flood risk to Californians, develop a sustainable flood management system, and lessen the consequences of floods.

The initiative builds upon the State's ongoing flood management work, especially progress made over the past two years since Governor Schwarzenegger called for improved maintenance, system rehabilitation, effective emergency response, and sustainable funding. In May 2007, DWR held public meetings in Sacramento and Los Angeles to discuss funding available to local agencies. DWR is facilitating the Local Levee and the Flood Protection Corridor Grant Programs as part of the recently-developed Local Levee Grant Program financially assists eligible local flood control agencies in evaluating local levees and in repairing and improving local flood control facilities.

In addition to the guiding principle to adapt flood management systems to cope with climate change, *FloodSafe California* supports and funds projects that offer a multiplicity of benefits, including regional initiatives that restore natural floodplain processes that integrate regional water management. DWR has established a set of criteria for projects that are part of the *State Plan of Flood Control for the Central Valley*, ready for early implementation in fiscal years 2007 through 2008.

Many of the proposals address conveyance capacity and in-channel flood storage. DWR's criteria for Early Implementation Projects emphasize the construction of setback levees and other non-structural approaches to flood management, when feasible, in

¹¹ See Division 43. The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, http://www.grantsloans.water.ca.gov/grants/leginfo/legis_Prop84.cfm



order to expand channel conveyance and in-channel flood storage, as well to provide important environmental benefits.

The Flood Protection Corridor Program, originally initiated under Proposition 13, funds acquisition, restoration, enhancement and protection of real property while preserving sustainable agriculture and enhancing wildlife habitat in and near flood corridors throughout the State.

DWR released its Proposal Solicitation Package (PSP) and scheduled application workshops on the Local Groundwater Assistance Grant Program (AB 303) in October 2007. Grants are available to conduct groundwater studies, monitoring, or groundwater management activities. \$6.4 million is available, with the maximum grant amount of \$250,000 per applicant. Applications were due December 11, 2007.

As part of the Delta Vision process, the Governor's Blue Ribbon Task Force is developing a strategy for managing the Delta, using DWR's input to recommend how to implement various resource management strategies described in Water Plan Update 2005. Recently, DWR presented the task force with two documents on the role of integrated regional water management and potential benefits of different resource management strategies. The first is "Implementing Integrated Regional Water Management to Meet Future Water Demands" and the other is "Near Term Actions Related to Water Supplies."

DWR is currently considering the design and future adequacy of California's water and flood management systems and the long term adaptability of these systems. The Governor's proposed new water storage capacity as part of his Strategic Growth Plan will provide additional water management flexibility, increase our ability to protect and improve water quality, and provide additional flood protection.

Water Use Efficiency Measures

Approximately 19 percent of electricity and 30 percent of natural gas (non-power plant) consumed in the State are used to convey, treat, and distribute water, before and after its use. Based on data from the draft *Statewide Assessment of Energy Used to Manage Water*,¹² the California Energy Commission (CEC) estimates at least 44 million metric tons of CO₂ emissions are expelled on average annually to provide the 44 million acre-feet (MAF) of urban and agricultural water used statewide. The primary sources of GHG emissions generated by water use are fossil fuel-based electricity generation and natural gas combustion.

¹² Wolff, G. and Wilkinson, R., *Statewide Assessment of Water-Related Energy Use*, The Pacific Institute and The Water Policy Program at UCSB, prepared for the CEC PIER Program, January 2007, CEC 500-2007-007.



The Governor has identified conservation as one of the key ways to provide water for Californians and protect and improve the Delta ecosystem. He has directed state agencies to develop and implement a more aggressive plan to help achieve a 20 percent reduction in per capita water use statewide by 2020. This directive builds upon the *California Water Plan Update 2005*, which identified water use efficiency as a “foundational action” for California water management.

To implement this goal, DWR is collaborating with the California Energy Commission, the California Public Utilities Commission and the State Water Resources Control Board to develop and implement various measures and strategies to increase water use efficiency and thereby reduce GHG emissions related to water use. To support this implementation, this conservation initiative will need to utilize the many Integrated Regional Water Management (IRWM) planning efforts throughout California. During 2008, the four-agency group will collaboratively prepare a statewide water use efficiency measure for consideration in the Public Review Draft of the California Water Plan Update 2009.