



The California Environmental Dialogue Perspective **Climate Change & Water Management**

Summary

California's climate change commitments compel our state's public and private entities to manage water resources more efficiently and to fully integrate water considerations into all resource management policies and plans, including those that address climate change mitigation and adaptation. With this in mind, all Californians should begin taking cost-effective and technologically-feasible steps to accelerate the statewide deployment of more efficient water resource management strategies. The California Environmental Dialogue (CED) encourages continued collaboration between all relevant agencies and stakeholders during the development and implementation of programs related to the water/climate nexus. To help to achieve this, the CED believes that water/climate programs should be developed and implemented in accordance with the recommendations contained herein.



Background

As highlighted by the California Energy Commission (CEC) in its 2005 *Integrated Energy Policy Report (IEPR)* and its follow-up report *California's Water-Energy Relationship*, the conveyance, treatment, delivery, and heating and cooling of water in California consumes more than 19 percent of the state's total electricity (48,000 gigawatt hours), 30 percent of its non-power plant natural gas (2,375 million therms), and nearly 3 percent of its diesel fuel (88 million gallons) every year – and this demand is growing. Clearly, the energy intensity of water use in California results in significant resource consumption and greenhouse gas (GHG) emissions. In its 2006 report *Our Changing Climate: Assessing the Risks to California*, the CEC warns that “rising temperatures, potentially exacerbated by decreasing precipitation, could increase the risk of water shortages.”



California leaders have made clear that water conservation and end-use efficiency must be a priority. In 2008, as part of a seven-part comprehensive plan for improving the Sacramento-San Joaquin Delta, Governor Schwarzenegger directed State agencies to develop a plan to reduce statewide per capita urban water use by 20 percent by the year 2020, marking the initiation of the *20x2020 Water Conservation Plan (20x2020 Plan)* process. The California Air Resources Board, in its *AB 32 Climate Change Scoping Plan*, proposes greenhouse gas emissions reduction strategies for the water sector. The State Water Resources Control Board and the Water-Energy Subgroup of the Cal/EPA's Climate Action Team also recognize the energy intensity of the state's water resource use and underscore the need for increased water use efficiency and conservation. Finally, in its *2009 California Climate Adaptation*



Strategy Discussion Draft, the California Natural Resources Agency stresses the challenges the state's water supply system will face under climate change and proposes water management adaptation strategies to address those challenges.

The California Environmental Dialogue (CED), a collaborative effort of California businesses, environmental groups, and government agencies, recognizes the significant GHG emissions impact associated with the conveyance, treatment, delivery, and heating and cooling of water in California, as well as how efficient water resource management can be of value to implementing climate change mitigation and adaptation strategies.

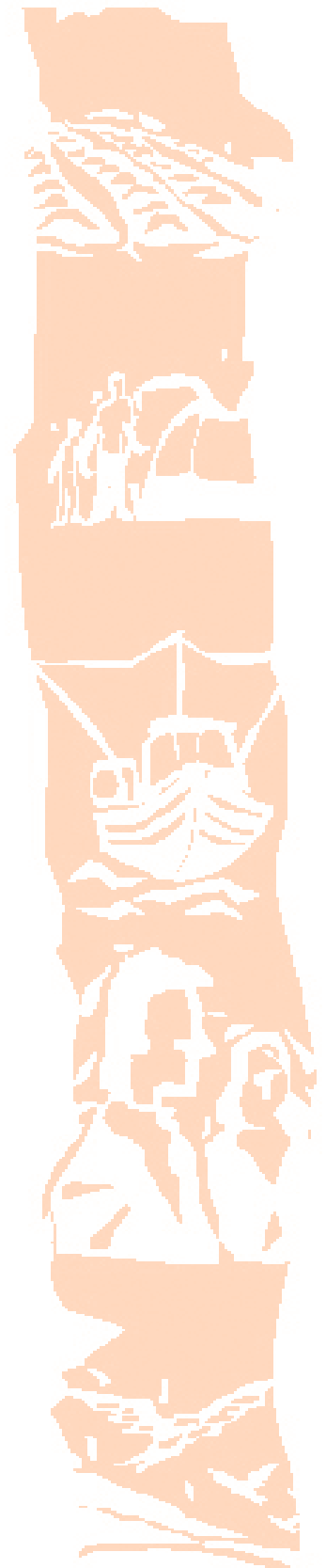
The CED understands that data collection and performance metrics will play critical roles in validating GHG emissions reductions and promoting cost-effective water resource management strategies (see Appendix for suggested metrics). The CED believes that data collection and performance metrics are essential in establishing credible performance thresholds for those water projects that produce quantifiable, verifiable, and enforceable additional GHG emissions reductions, as well as water infrastructure benefits. Furthermore, the CED believes that the water/climate project protocols derived from these tools will allow public and private water projects to generate GHG emissions reductions when the project:

- 1) Reduces direct energy use;
- 2) Reduces indirect energy use; and/or,
- 3) Reduces on-site GHG emissions.

The CED acknowledges that upgrading California's water management systems will generate significant GHG emission reductions and better prepare California for the impacts of climate change on statewide water supply.

Existing Water/Climate Efforts & Developing Metrics

There are several programs, plans, and proposals currently available or in development that are meant to help address the water/climate nexus in California (see Appendix for a list of existing water/climate efforts). These efforts are commendable, and the entities responsible for administering them should continually work together to share data, establish performance metrics and thresholds, and develop protocols for assessing the emissions and cost effectiveness associated with various water management options. *To accurately assess GHG emissions reduction credit for water projects, credible and consistent performance metrics and thresholds need to be developed and utilized.*



Addressing California's Water/Climate Nexus

The CED believes that water/climate programs should be developed and implemented in accordance with the following recommendations:

- 1. Establish GHG Reduction Protocols for Water Projects** – California needs additional data collection and robust GHG emissions reduction project protocols in order to account for the region-specific energy and GHG benefits and/or impacts associated with competing water supply, conveyance, treatment, delivery, and heating/cooling options. The development of credible GHG protocols for water projects will be essential in validating water-related GHG emissions reductions.
 - **Water-Energy Action** – Water sector GHG project protocols will help to accelerate the market adoption of water-energy innovations throughout California by quantifying a previously undesirable and unobserved operational externality.
 - **Climate Action** – Use water-energy pilot program and local/regional resource agency data to develop performance metrics and thresholds that will serve as the foundation for GHG emissions reduction project protocols. The data gathered from the California Public Utilities Commission (CPUC) Water-Energy Pilot, Operational Energy Efficiency for Water Utilities, and Water-Energy Cost-Effectiveness Calculator Program should be incorporated into the framework for water sector GHG emissions reduction quantification and credit allocation under the statewide emissions cap. When protocols are complete, public and private entities should quantify the contributions of water/climate projects to the AB 32 GHG emissions reduction goals.
- 2. Increase Water Use Efficiency** – Improvements in end-use water efficiency and conservation will likely generate the lowest cost resource conservation benefits and GHG emissions reductions of all water resource management options. California needs to employ a long-term perspective to water use efficiency and conservation by maintaining a decoupled rate structure for water utilities that encourages them to conserve water and by encouraging the large-scale application of technological and operational advancements in water resource management.
 - **Water-Energy Action** – Encourage metering and other technologies that provide end users with a better understanding of their water consumption patterns, and help them to identify additional efficiency and conservation opportunities. Achieve the Governor's goal of a 20 percent reduction in per capita water use by 2020 through the combined efforts of the legislature, state and federal agencies, utilities, water agencies, and water users. Encourage the development of new tools to encourage and enable ambitious efficiency measures in the agricultural sector. Look for opportunities to apply to the water sector tools that have helped establish California as a global leader in energy efficiency (e.g. a loading order, public goods charge, and performance based metrics). Revise Best Management Practices (BMPs) to reflect modern technology advances and investigate how to increase market penetration beyond the limits of most Urban Water Management Plans.
 - **Climate Action** – Identify and implement water-use efficiency measures and projects at public and private facilities that have GHG emissions reduction and climate change adaptation benefits.
- 3. Manage Urban Runoff** – Stormwater reclamation and use and groundwater/aquifer recharge strategies offer tremendous potential for California's water supply chain because they greatly reduce the need to deliver and treat water from energy-intensive systems.
 - **Water-Energy Action** – Encourage stormwater use and groundwater recharge by incentivizing Low Impact Development (LID). Also encourage stormwater use and groundwater recharge through natural systems by providing incentives (1) to protect lands adjacent to rivers, lakes, and streams, (2) to convert artificially impervious areas to pervious lands, and (3) to retrofit existing impervious areas to catch, filter, cleanse, store and reduce runoff.

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- **Climate Action** – Quantify and assess the GHG emissions reduction and climate change adaptation benefits of implementing additional stormwater use and groundwater recharge projects at public and private facilities.
4. **Increase Water Recycling** – Public and private decision makers should accelerate the use of recycled water.
- **Water-Energy Action** – Increase the level of public understanding of current water treatment capabilities, as well as of the fact that most water is de facto recycled today, to address concerns about the safety of recycled water. Better understand the benefits of increased use of recycled water in terms of reliability of delivery systems and changing water characteristics. Provide incentives for increased use of recycled water.
 - **Climate Action** – Quantify and assess the GHG emissions reduction and climate change adaptation benefits of implementing additional water recycling projects at public and private facilities.
5. **Improve Groundwater Management** – Encourage the clean-up and integrated use of groundwater in California.
- **Water-Energy Action** – Require comprehensive monitoring and reporting of groundwater recharge and withdrawals to the State Water Resources Control Board to facilitate improved management and planning. Develop targeted clean-up efforts designed to improve the ability of water agencies to manage key groundwater basins. Promote the regional collaboration of agencies to encourage integrated groundwater management to facilitate low impact development and water recycling.
 - **Climate Action** – Quantify and assess the GHG emissions reduction and climate change adaptation benefits of improved groundwater management.
6. **Utilize Natural Resource Systems and Holistic Landscape Design** – Policies and funding incentives should be created to improve water quality by protecting watersheds from the headwaters to the tap by using soil, plants, and natural processes to capture, filter and clean polluted urban and stormwater runoff while creating and protecting natural habitat, recreational, and open space lands. Holistic landscape design and construction practices reduce energy required for maintenance (e.g. cutting or pruning), water supply, and use of inorganic fertilizers, as well as sequester carbon and reduce water quality pollution.
- **Water-Energy Action** – Create incentives and policies to encourage protecting open space and natural watershed lands and adopting holistic landscape design and construction practices.
 - **Climate Action** – The expansion of green spaces reduces the energy use and GHG emissions associated with water delivery and treatment by providing a medium for wastewater recycling and increased stormwater retention and filtering. Quantify and assess the GHG emissions reduction and climate change adaptation benefits of implementing additional water recycling and groundwater projects by natural resource systems and holistic landscape design and construction practices.
7. **Improve Water System Energy Efficiency** – Due to the energy intensity of California’s water conveyance, treatment, delivery, and heating and cooling systems, these strategies will result in significant resource conservation benefits and GHG emissions reductions.
- **Water-Energy Action** – Encourage the expansion of Urban Water Management Plans to integrate energy and climate issues, and to identify adaptation measures designed to reduce the vulnerability of water systems to the anticipated impacts of climate change on historic hydrology.

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- **Climate Action** – Quantify and assess the GHG emissions reduction and climate change adaptation benefits of retrofitting and/or retiring equipment within public and private water resource management systems.
- 8. Increase Renewable Energy Production** – While it is important to recognize the renewable energy already produced by the water sector (e.g. hydroelectricity) and the wastewater sector (e.g. methane capture), it is also important to encourage increased renewable energy generation. Retrofitting, replacing, and/or repowering inefficient equipment in California’s water systems to take advantage of innovations in renewable energy technology will help to decrease the GHG and resource intensity of California’s water systems.
- **Water-Energy Action** – Install in-conduit hydroelectric, combined heat & power (CHP), and geothermal and other heat exchange systems where feasible in order to encourage technological innovation and resource efficiency within the water sector. Create incentives for (e.g. tax rebates, public financing, and grants), and remove regulatory barriers to renewable energy generation, and take advantage of opportunities to promote renewable energy projects.
 - **Climate Action** – Quantify and assess the GHG emissions reduction, renewable portfolio standard (RPS), and climate change adaptation benefits of implementing additional renewable energy projects at public and private water facilities (e.g. solar, wind, in-conduit hydroelectric, biomethane capture, fuel cells, etc.).
- 9. Utilize Adaptive Management** – Public and private entities should work collaboratively to adapt policies and programs to address unanticipated or unintended consequences of water/climate actions on water quality and public health. In addition, decision makers must assess the potential energy trade offs associated with some water resource management innovations, as well as acknowledge that urban-based water/climate strategies may not readily apply in rural and/or agricultural settings.
- **Water-Energy Action** – Use water-energy pilot program and local/regional resource agency data on water sector best management practices (BMPs) to better understand the water/energy trade offs associated with proposed water/climate strategies and to better implement climate change mitigation and adaptation strategies.
 - **Climate Action** – Assess the potential GHG additionality issues associated with proposed water/climate strategies associated with likely water/energy efficiency mandates. Create a University-led focus for evaluating under California’s operating conditions existing and emerging technologies and techniques that can be used to accelerate the implementation of water sector BMPs.
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Conclusion

California requires significant fiscal, technological, and human resources to implement near-term strategies that reduce GHG emissions. California also needs resources sufficient to develop long-term, statewide strategies that accommodate the probable impacts of climate change on our state’s water resources. While the passage of AB 32 created opportunities to achieve near-term GHG emission reductions, this measure is not the final policy action, given California’s proposed 2050 GHG emissions reduction goals, and the continued climate change risk exposure of our state’s water supply systems.

The CED believes that improved water resource management strategies can help in the collective effort to achieve California’s GHG emissions reduction goals and to mitigate and adapt to climate change risks.

The CED offers these recommendations to support California’s public and private sector entities as they work together to implement comprehensive climate change policies that will ensure both creditable GHG emissions reductions and long-term water resource security for California.

Appendix

Essential Water/Climate Metrics

- 1) Million therms (MTh) of natural gas/acre-foot of water consumed (AF)
- 2) Gallon of liquid fuel (e.g. gasoline, diesel, or biofuel)/AF
- 3) Kilowatt-hour (kWh) of electricity/AF
- 4) Metric ton (MT) of Carbon Dioxide Equivalent (CO₂e)/AF
- 5) Water consumption per household and per capita
- 6) Groundwater and surface water withdrawals
- 7) Volume of water recycled
- 8) Impact of water efficiency measures in gallons of water saved
- 9) Extent of metering
- 10) Take-up of BMPs, when defined
- 11) Miles of river per month with impaired flows due to water withdrawals
- 12) Species at risk due to water withdrawals (types, locations, numbers, etc.)

Existing Water/Climate Efforts

- ❖ California Environmental Protection Agency (Cal/EPA)
 - Climate Action Team (CAT)
 - Water-Energy Subgroup of the Climate Action Team (WETCAT)
- ❖ California Air Resources Board (CARB)
 - AB 32 Scoping Plan Water Sector Measures
- ❖ State Water Resources Control Board (SWRCB)
 - Clean Water State Revolving Loan Fund (CWSRF)
 - Water Recycling Policy
- ❖ California Department of Water Resources (DWR)
 - 2008 Climate Change Adaptation Strategies for California's Water
 - 2009 Water Plan Update
- ❖ California Energy Commission (CEC)
 - Biennial Integrated Energy Policy Report (IEPR)
- ❖ California Public Utilities Commission (CPUC)
 - Flex Your Power
 - Operational Energy Efficiency Program for Water Utilities
 - Water-Energy Pilot Program
 - Water-Energy Cost-Effectiveness Calculator
- ❖ Bay-Friendly Landscaping & Gardening Coalition
 - Holistic landscape design and construction practices can be found at www.bayfriendlycoalition.com, among other locations
- ❖ U.S. Environmental Protection Agency (USEPA)
 - Energy Star Program
 - Water Sense Program
- ❖ The Water Utility Climate Alliance (WUCA)
 - Includes the San Francisco Public Utilities Commission, San Diego County Water Authority, the Metropolitan Water District of Southern California, Denver Water, New York City Department of Environmental Protection, Portland Water Bureau, Seattle Public Utilities and Southern Nevada Water Authority
- ❖ Water efficiency efforts at regional agencies, and within the private sector; e.g.
 - Inland Empire Utilities Agency (IEUA)
 - Water Replenishment District of Southern California
 - IBM Big Green Innovations

CED Member Organizations



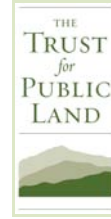
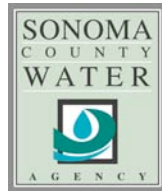
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California Council for Environmental and Economic Balance



Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions



USEPA, Region IX



The Walt Disney Company



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Long View Committee Members



Participating Agencies*

- California Air Resources Board
- California Business, Transportation, and Housing Agency
- California Department of Food and Agriculture
- California Department of Water Resources
- California Energy Commission
- California Environmental Protection Agency
- California Natural Resources Agency
- California Public Utilities Commission
- California State Water Resources Control Board

*The listed state agencies provided valuable input on this Issue Statement in the interests of advancing California environmental policy and played an advisory role to CED; their listings do not signify official agency endorsement.

California Environmental Dialogue

The mission of the California Environmental Dialogue (CED) is to engage California business, environmental, and government leaders collaboratively to produce timely and improved environmental protection while reducing costs to business, government and society. By engaging in a formal dialogue, CED builds relationships and trust, which allow its members to pursue public and private policies leading to enhanced environmental outcomes and economic efficiencies.

For more information on CED, please visit our website at www.cedlink.org or contact:

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