

Energy and water use in California are interconnected

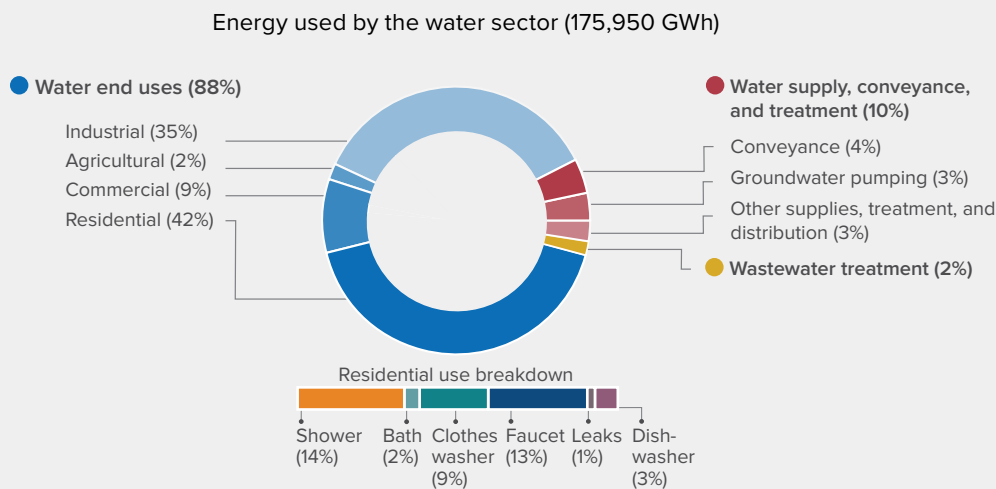
California’s water system is energy intensive, accounting for nearly 10 percent of the state’s greenhouse gas (GHG) emissions. According to the most recent estimates, approximately 20 percent of statewide electricity use—and 30 percent of business and home use of natural gas—goes to pumping, treating, and heating water. Water is also required for the production of energy. Hydropower generation, thermoelectric power plants, and oil and gas extraction all use water.

Actions that improve water-use efficiency can reduce energy use. Actions that improve energy efficiency can, in turn, reduce energy sector impacts on water supply and quality. In contrast, some actions to boost the water sector’s resilience to droughts can increase energy use. And measures to reduce the energy sector’s water use can make energy production more costly.

State policies—including efforts to reduce GHG emissions—have begun to promote managing water and energy in tandem. Some state programs provide grants for water and energy efficiency programs, and the California Public Utilities Commission (CPUC) is working with utilities to quantify energy savings from water conservation. During the latest drought, the California Energy Commission (CEC) also launched an effort to reduce the energy sector’s vulnerability to water shortages.

Continued population growth and a changing climate will place increasing pressure on water and energy supplies. To meet this challenge, California will need to continue adopting policies and technologies that improve water and energy management, while being attentive to potential trade-offs.

MOST ENERGY CONSUMED BY CALIFORNIA’S WATER SECTOR GOES TO RESIDENTIAL USE



SOURCE: California Public Utilities Commission, *Embedded Energy in Water Studies. Study 1: Statewide and Regional Water-Energy Relationship* (prepared by GEI Consultants/Navigant Consulting, Inc., 2010).

NOTES: The figure shows total energy use by California’s water sector—175,950 gigawatts per hour (GWh). The figure includes water-related electricity (29% of the total) and natural gas (71%), converted to equivalent measures, for 2001—the last year for which end-use estimates are available. Conveyance includes the energy used in the California State Water Project, the Central Valley Project, the Colorado River Aqueduct, and several regional water systems. Groundwater pumping is for urban and farm uses. Irrigation system management, such as pressurization, is an agricultural water end use. Residential end uses include energy used in heating water and running appliances, but not the embedded energy for supplying or treating water.

California’s water sector is a large energy user

Although California’s agriculture uses roughly four times more water than cities, cities use most water-related energy. End uses of water—especially for water heating—make up almost 90 percent of the total. Pumping, conveying, and treating water and wastewater make up the remainder. Opportunities for reducing energy use often depend on local conditions.