

WELCOME to the BayREN FORUM

July 29, 2014

The Water-Energy Nexus: Strategies for Local Action

East Bay Municipal Utility District Training Resources Center
Oakland, CA



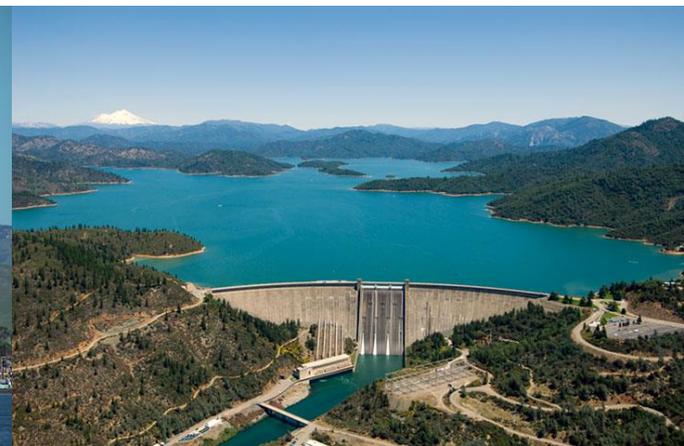
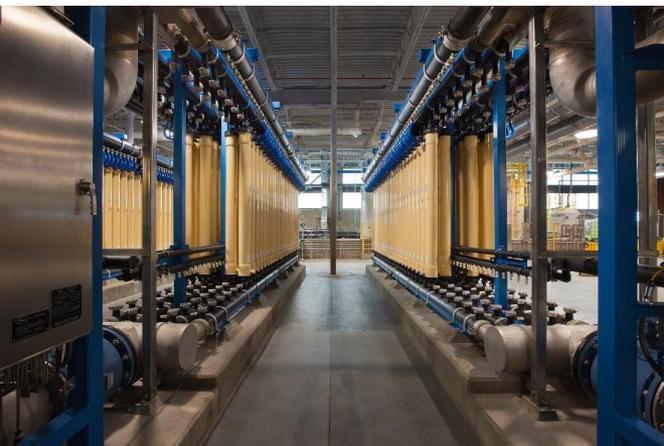
What is the water-energy nexus?

- Water and energy supplies are interdependent
 - Water is consumed for energy supply
 - Water generates energy supply
 - Energy is consumed for water supply
 - Energy is consumed for water heating



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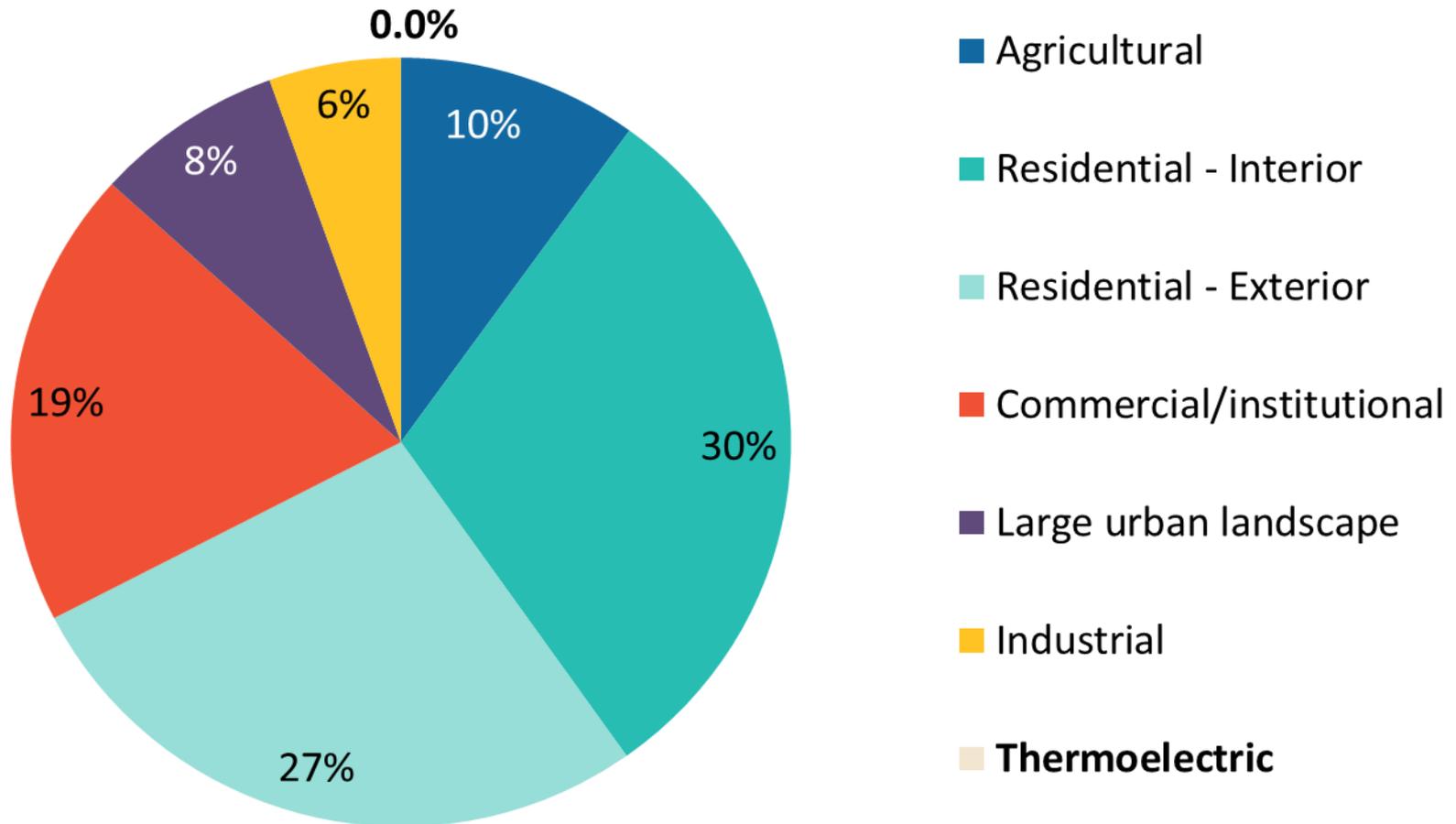
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Why is water-energy nexus important to local governments and agencies?

- Counties, cities, special districts, and other water agencies are the front lines for ensuring urban consumers have adequate clean water supply
- Local governments must meet climate action goals within confined budgets
- Municipal utilities are uniquely poised to internally align their water-energy efforts

2001 Freshwater end-uses in SF Bay watershed



In what ways does water use energy?

- Upstream of the consumer meter
 - Water extraction
 - Water conveyance
 - Water treatment
 - Potable water distribution
- Downstream of the consumer meter
 - Water heating
- Downstream of the consumer sewer line
 - Wastewater collection
 - Wastewater treatment
 - Wastewater discharge

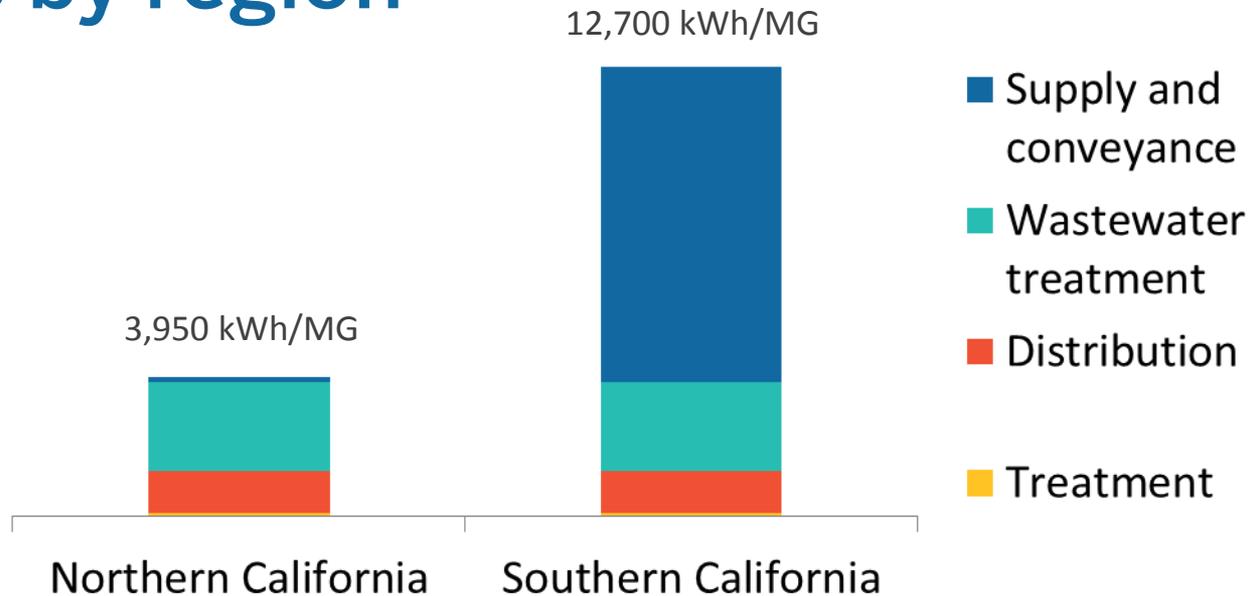


Energy used for water

- About 7% of electricity and 24% of natural gas use in California are attributable directly to pumping, wastewater treatment, and water heating
- But additional energy is used for indirect water uses (e.g., industrial processing, manufacturing, evaporative cooling)
- In all, about 19% of electricity and 32% of natural gas use in California is water-related¹

¹ Source: <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>, Table 1-1 (Gary Klein, 2005)

Embedded energy in water varies by region

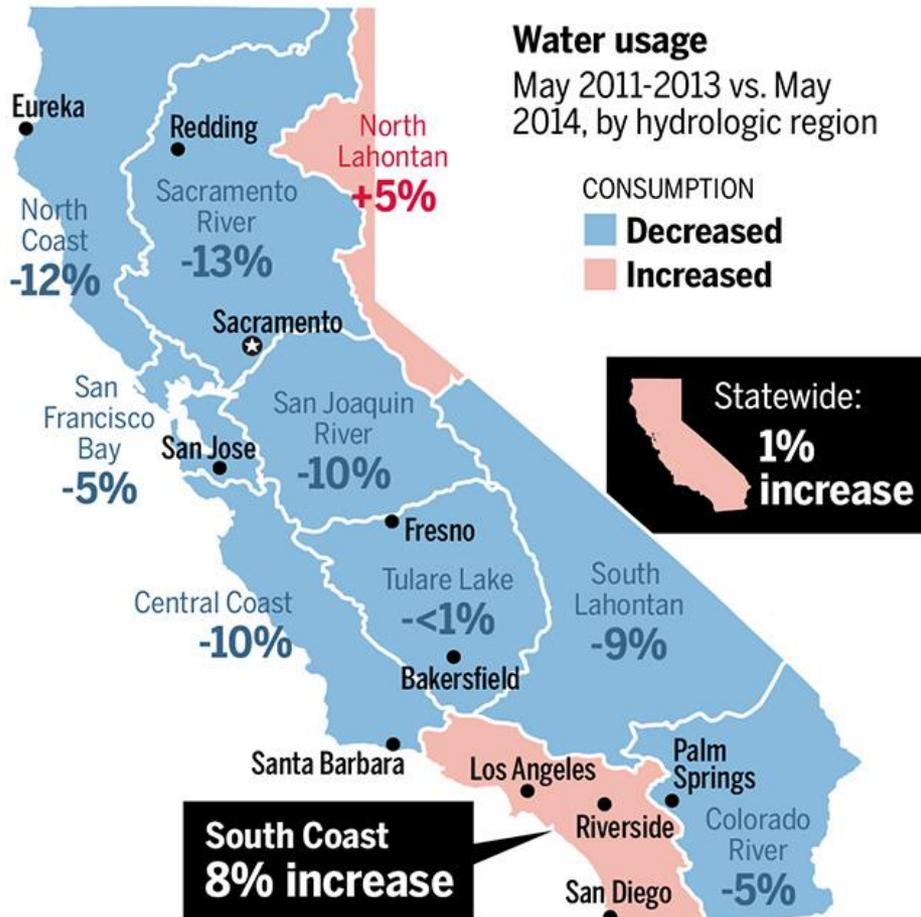


Source: <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>, Table 1-3 (Gary Klein, 2005)

- Navigant Consulting is performing a water-energy cost effectiveness analysis that examines embedded energy of marginal water supply for 10 hydrologic regions in California
 - More information at <http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Water-Energy+Nexus+Programs.htm>

Who saved, who didn't

Although most regions reduced consumption this year, California as a whole consumed 1 percent more than the average May over the past three years, mainly because of usage in Southern California.



Source:
http://www.mercurynews.com/drought/ci_26149855/see-which-californians-are-increasing-water-use-despite, July 15, 2014

Water-energy nexus challenges and solutions

- Water and energy programs are typically designed and operated separately
 - This Forum highlights successful efforts to address water and energy under the same initiative
 - Programs can cross-cut internally (within water agency) or be inter-agency
- Voluntary water reductions have been inadequate to meet state and regional goals
 - Permanent equipment upgrades/lawn conversions combined with behavior and education campaigns can enhance water and energy savings