



Water-Related Energy Use in California

Assembly Committee on Water, Parks and Wildlife

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Integrated Energy Policy Report 2005¹

Water & Energy Recommendations



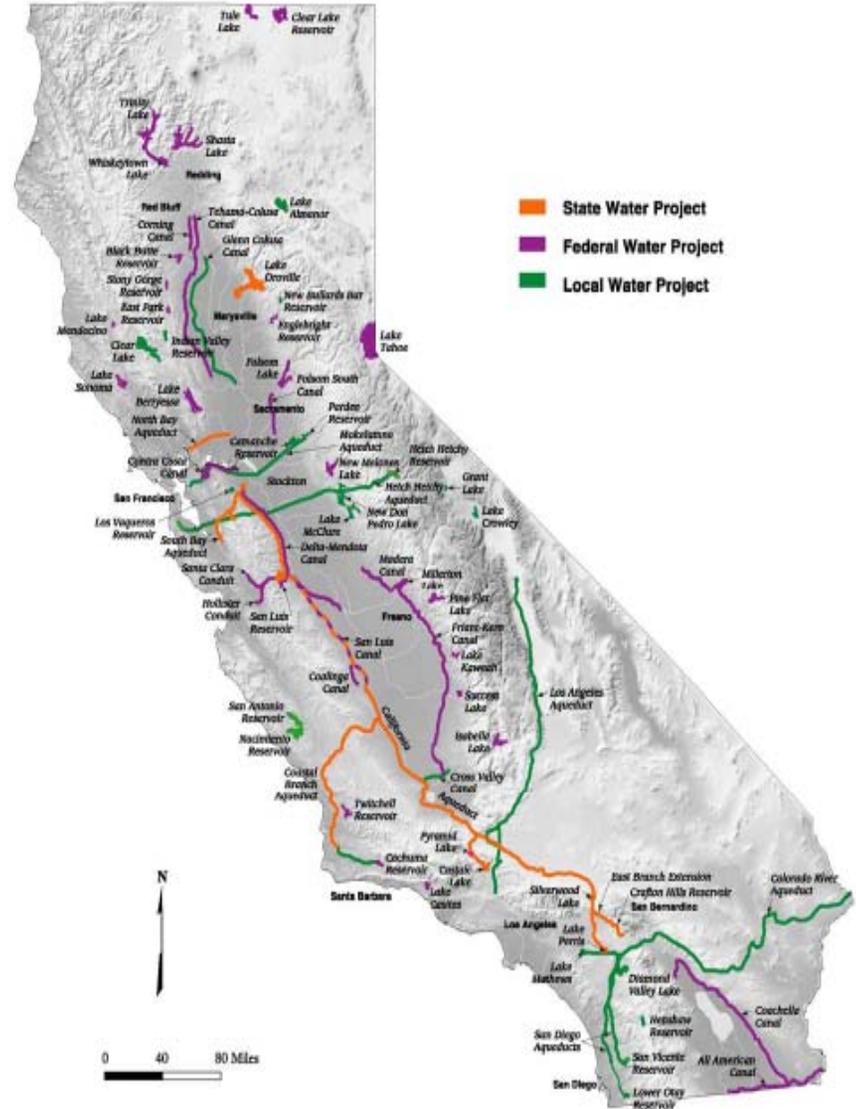
- * Evaluate and conduct research to understand interaction of water and energy within the state.**
- * Identify new and innovative technologies to achieve energy and water efficiency savings.**
- * Address potential savings throughout the water use cycle, especially in Southern California.**
- * Focus on identifying and implementing cost-effective retrofits in the water system.**
- * Increase efficiency and provide both net and peak energy savings.**
- * Examine increased savings through Time Of Use water tariffs and meters and increased flexibility in water deliveries.**



Water



- ★ **2/3** of Precipitation in North
- ★ **2/3** Demand in the South
- ★ **Water Demand:**
43 maf
- ★ **Energy Use:**
48,000 GWh; 4,300 MTh
- ★ **Population by 2030:**
48 million
- ★ **2030 Water Demand:**
43-50 maf ?

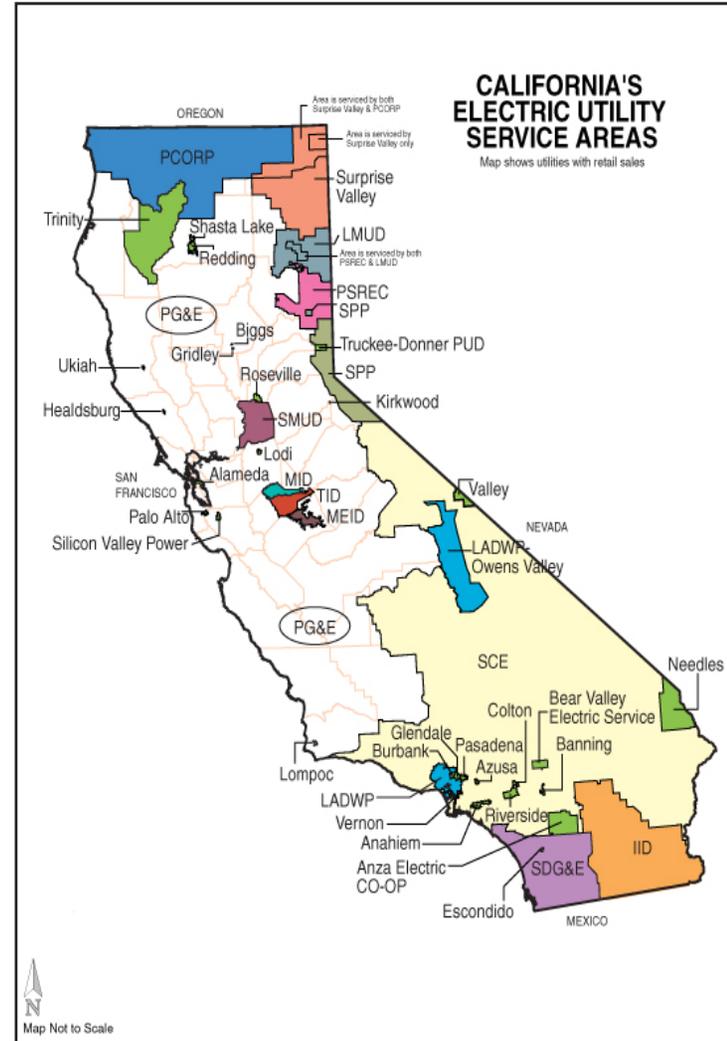




Energy

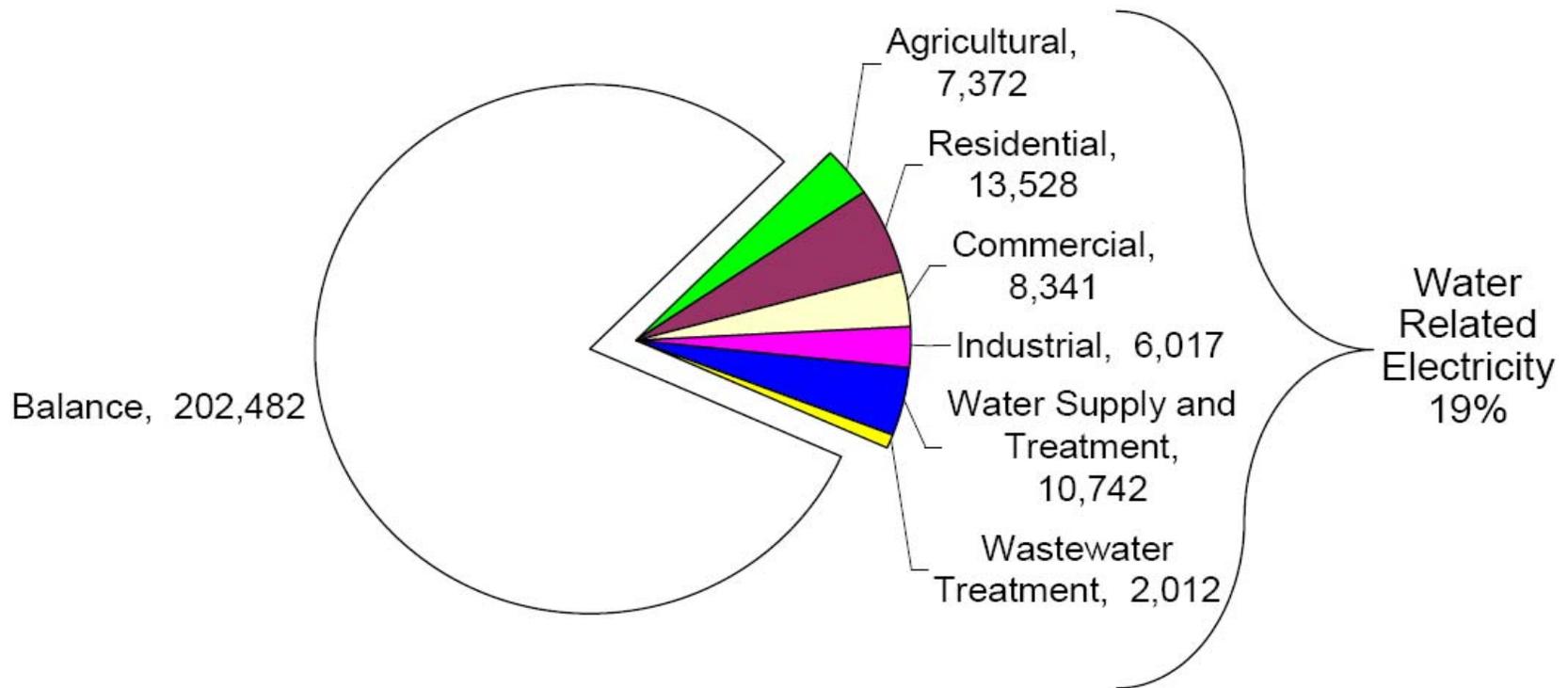


- ★ **Population: 34 million, 1.2% per year growth**
- ★ **Multiple Utility Service Territories**
- ★ **2004 Electricity Use: 271,000 GWh**
- ★ **2004 Peak Demand: 56,435 MW**
- ★ **Annual growth: Consumption - 1.4% Peak - 1.65%**





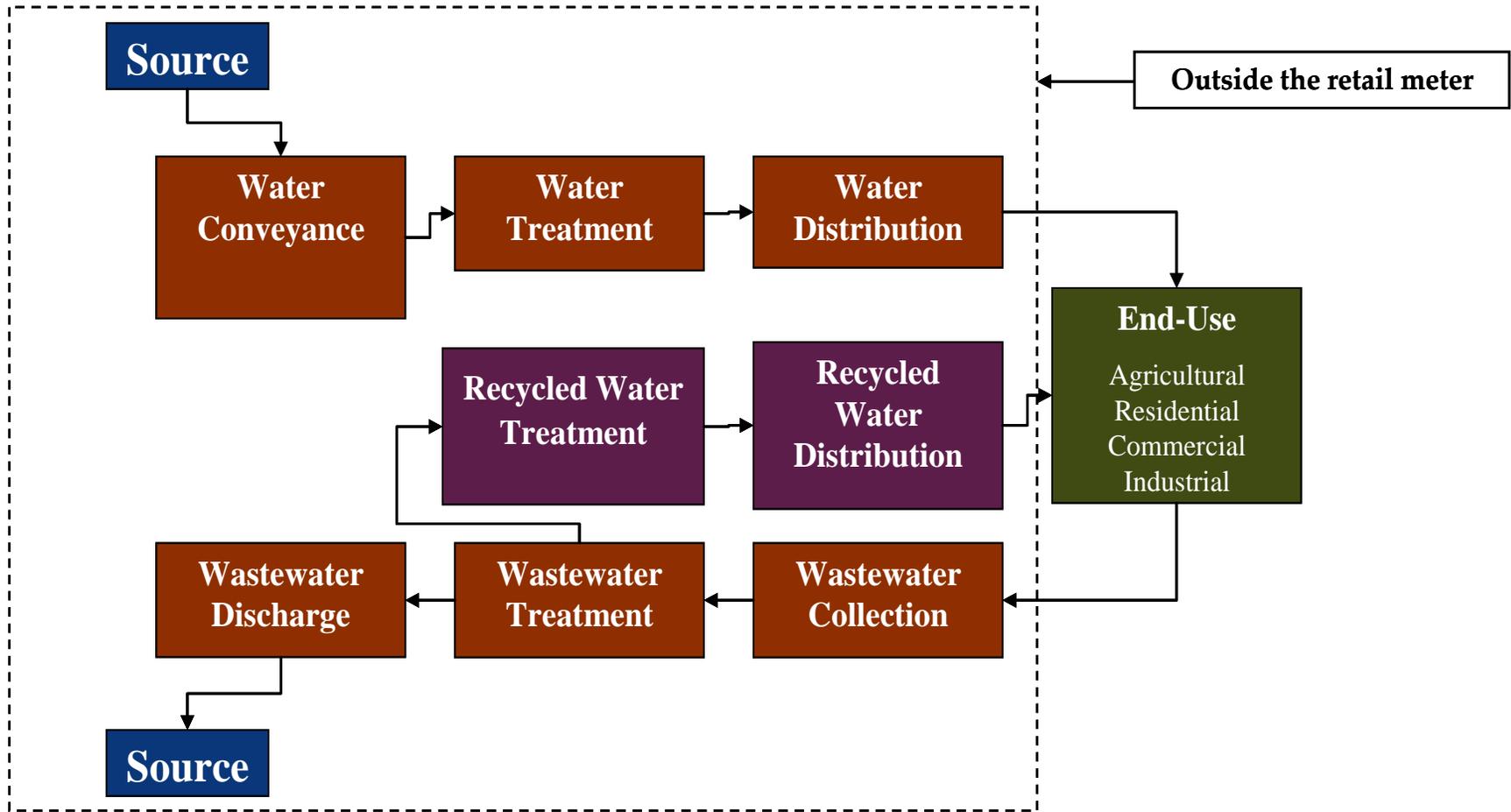
California's Water System in 2001 Electricity Demand



Total Electricity Demand in 2001 = 250,454 GWh



Where Energy is Embedded in Water² The Water-Use Cycle



Energy is embedded in water in each sector, and is cumulative.



Recommended Revised Estimates for Water Embedded Energy²



	Indirect Water Use		Direct Water Use	
Water Supply and Conveyance	2,117	9,727	2,117	9,727
Water Treatment	111	111	111	111
Water Distribution	1,272	1,272	1,272	1,272
Wastewater Treatment	1,911	1,911	0	0
Regional Total	5,411	13,022	3,500	11,111

These estimates are sufficient for near-term planning purposes but should be updated periodically as new information becomes available.

²Refining Estimates of Water Related Energy Use In California, CEC, December 2006



Water & Energy Synergies: The Foundation of the CEC R&D Agenda



Saving Water Can Save Energy

- Improve operational efficiency of systems
- Retrofit infrastructure for efficiency/conservation
- Lower demand and intensity of end uses

Reduce Net and Peak Energy Demand on Grid

- Advanced metering
- Time Of Use rates and other price signals
- Shift water-energy load off peak

Energy Generation

- Develop system resources (in-conduit, biogas)
- Develop other renewable resources (solar, wind)



California Energy Commission



Thank You

www.energy.ca.gov

References

Integrated Energy Policy Report, 2005

http://www.energy.ca.gov/2005_energypolicy/index.html

Refining Estimates of Water Related Energy Use In California

http://www.energy.ca.gov/pier/final_project_reports/CEC-500-2006-118.html#ExecutiveSummary

California's Water-Energy Relationship

<http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>