



Water-Energy Nexus

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Pacific Institute
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About the Pacific Institute

Mission

The Pacific Institute creates and advances solutions to the world's most pressing water challenges.

Vision

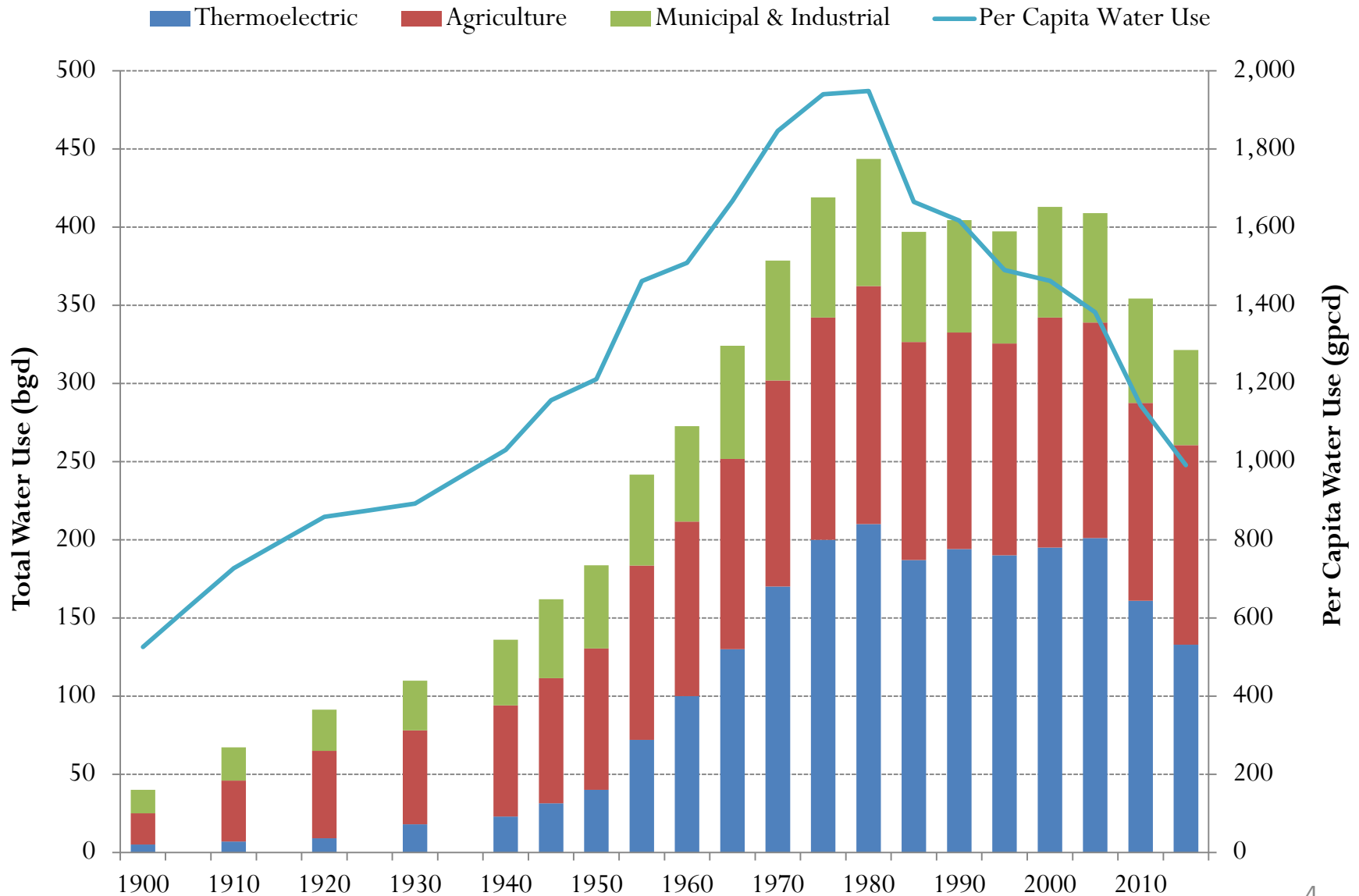
We envision a world in which society, the economy, and the environment have the water they need to thrive now and in the future.



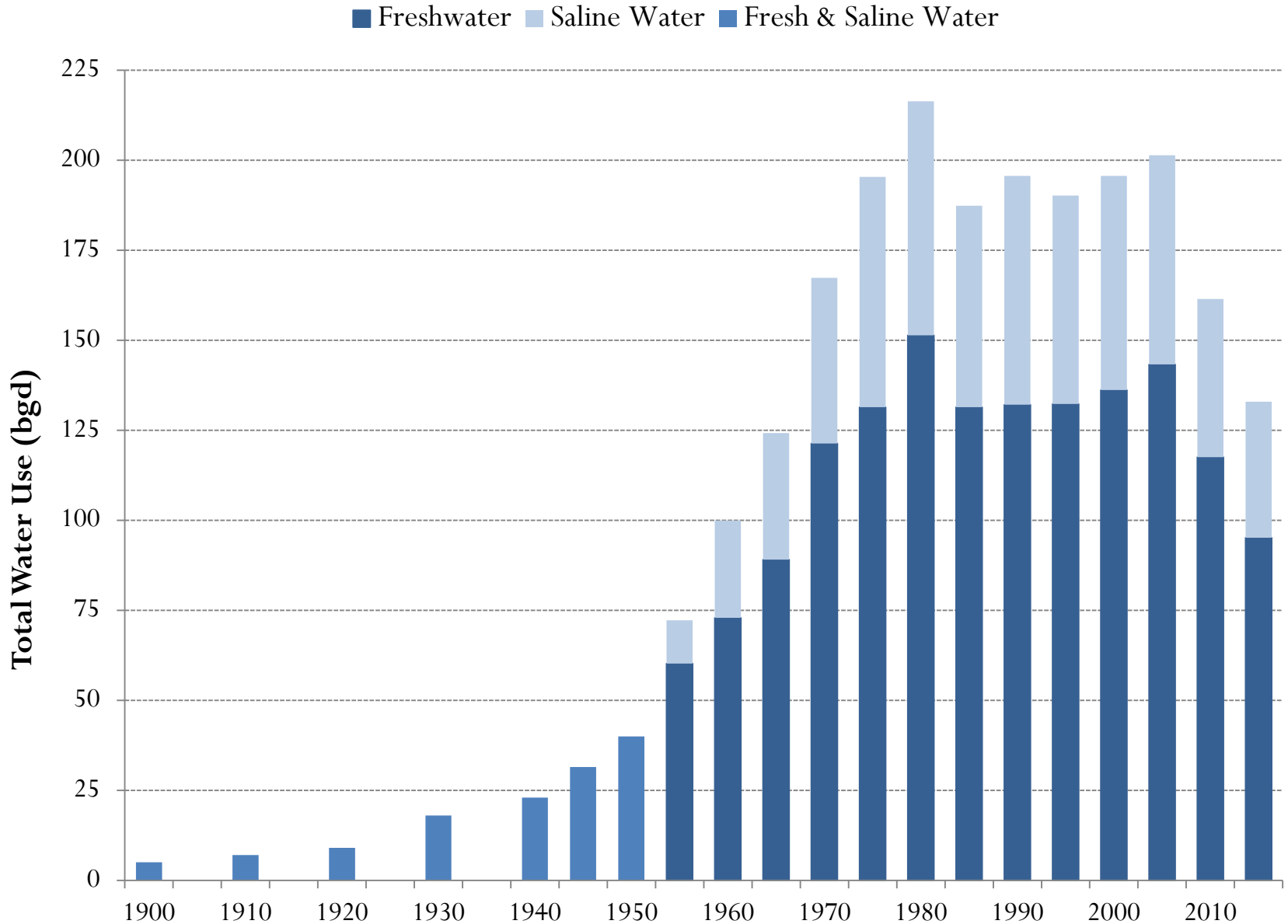
Overview

- National trends in water use
- Water requirements for energy
- Energy requirements for water systems
- Opportunities for saving water and energy

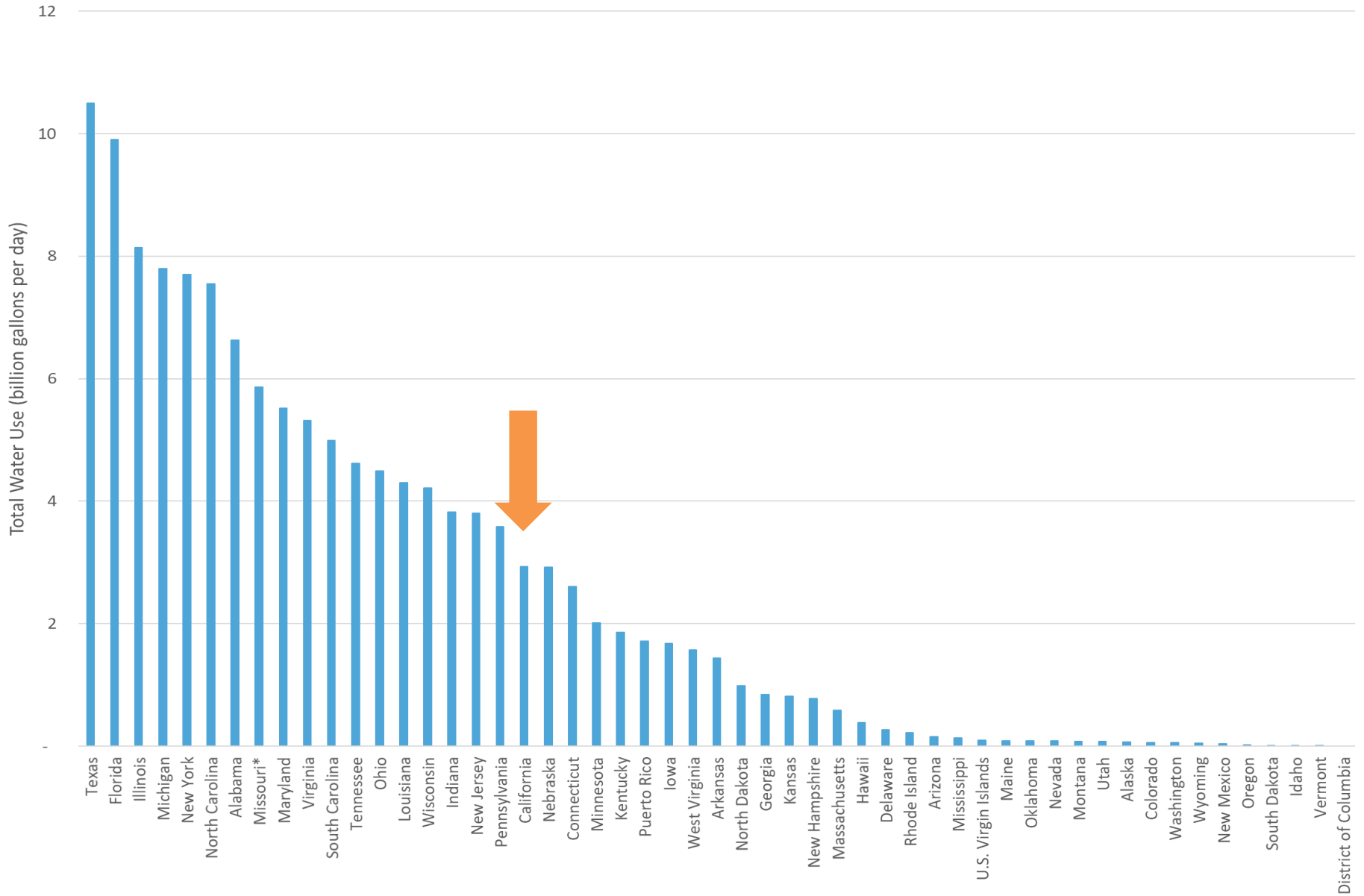
National Water Use Trends



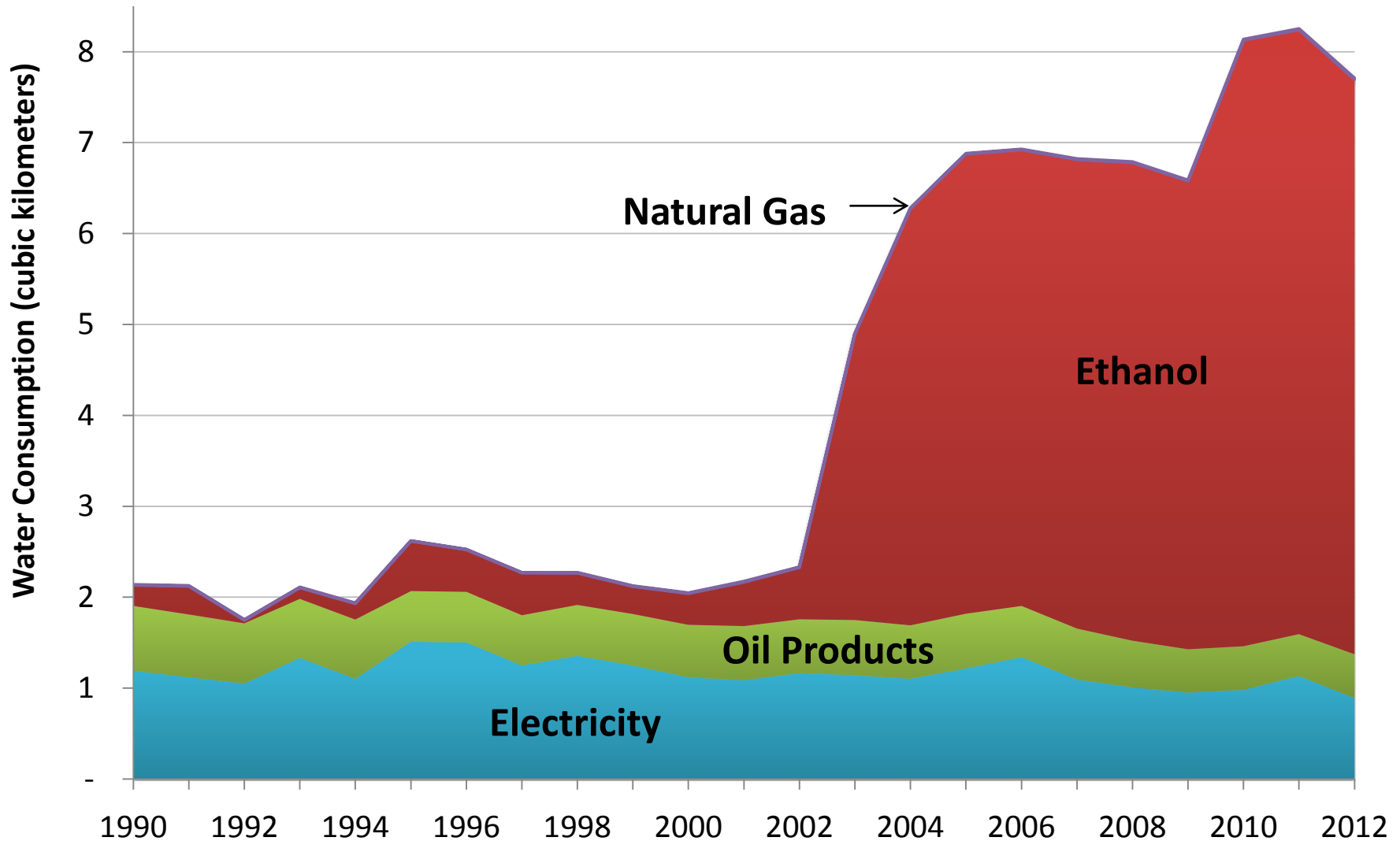
Water Requirements for Energy



Water Use by State

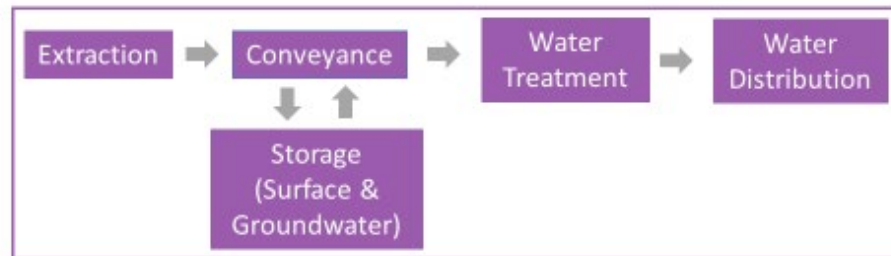


California's Water-Energy Footprint



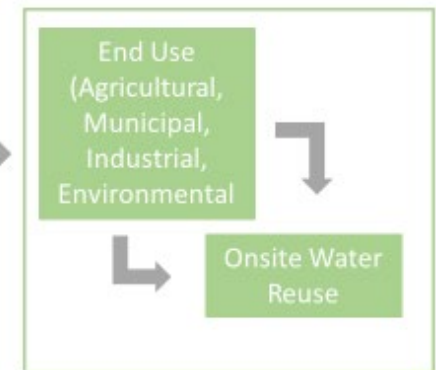
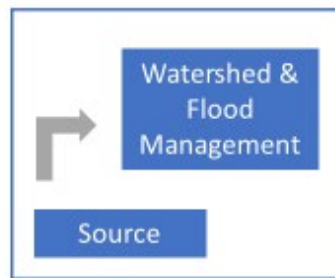
Flow Diagram of Energy for Water Systems

Pre-Use Management



Onsite Water Use/Reuse

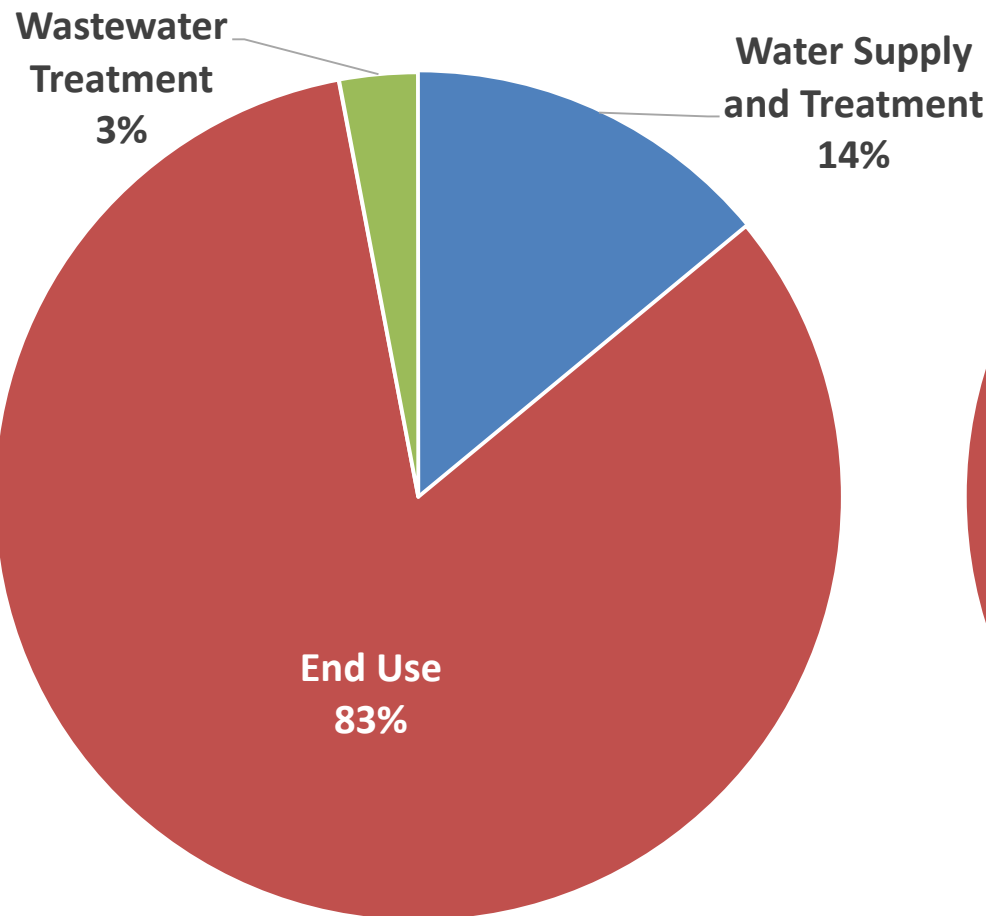
Natural Systems



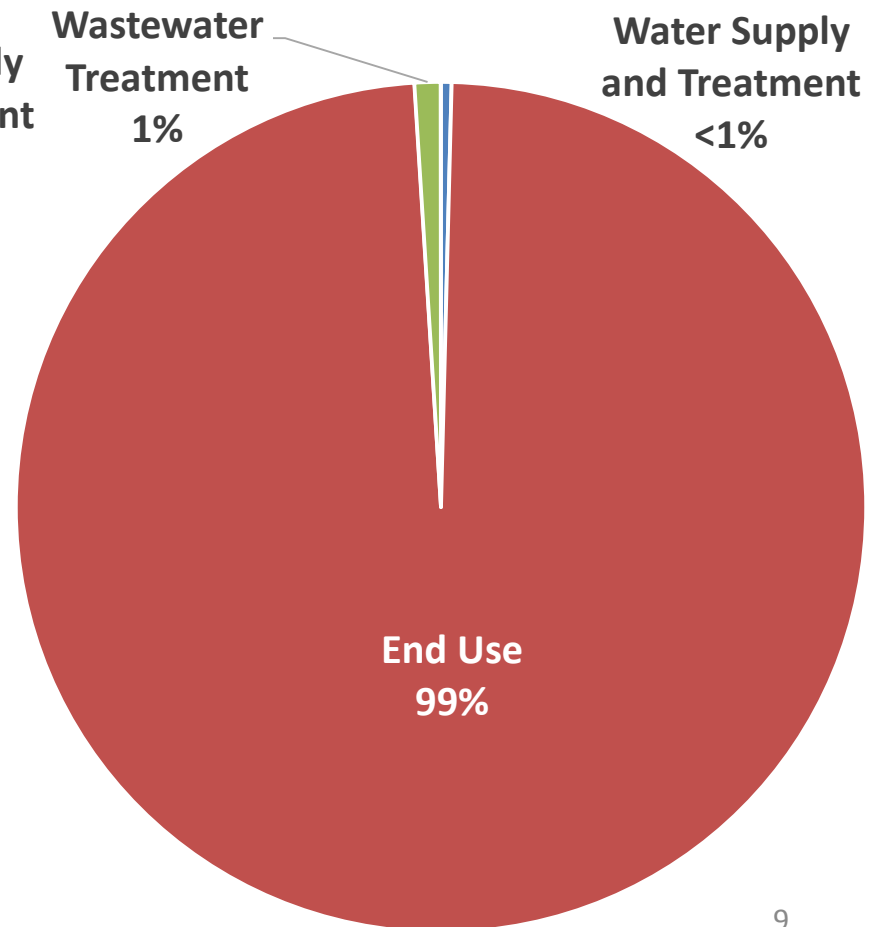
Post-Use Management

Water-Related Energy Use in California

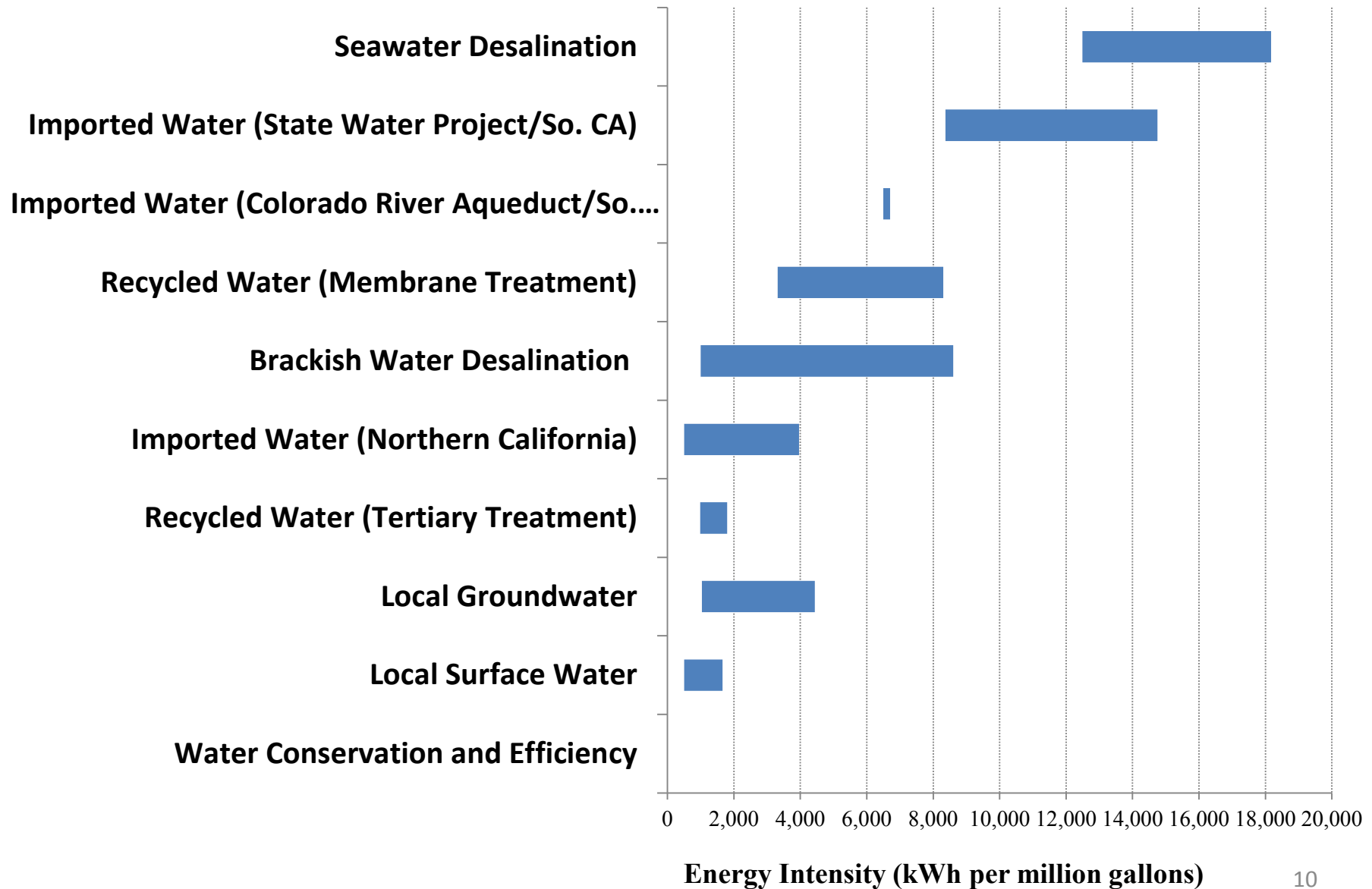
20% of state's electricity use:



33% of state's non-electricity natural gas use:



Energy Intensity of Water Supply and Efficiency Options



Water Efficiency Saves Energy at Lower Cost...

	Energy Efficiency Programs	Water-Use Efficiency Programs
Energy Savings (billion kWh; annualized)	6.8	6.5
Cost (\$ million)	\$1,500	\$826
Cost per kWh; annualized	\$0.22	\$0.13

95% of the savings at 55% of the cost

...and Save Consumers Money

	New, Conventional Clothes Washer	Front-Loading Clothes Washer
Purchase Price	\$450	\$750
Water Cost	\$496	\$290
Total Cost	\$946	\$1,040

...and Save Consumers Money

	New, Conventional Clothes Washer	Front-Loading Clothes Washer
Purchase Price	\$450	\$750
Water Cost	\$496	\$290
Energy Cost	\$401	\$177
Total Cost	\$1,346	\$1,216

Concluding Thoughts

- Water and energy are linked, but these links are poorly understood or used to inform policy decisions.
- These linkages present challenges, but they also provide opportunities.
- In many cases, efficiency provides a virtuous cycle: saving water saves energy, which saves even more water.
- Tradeoffs may be needed but awareness of those tradeoffs should be integrated into project, program, and policy decisions.



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Urban Water Supply and Efficiency Options in California

