

This presentation premiered at WaterSmart Innovations

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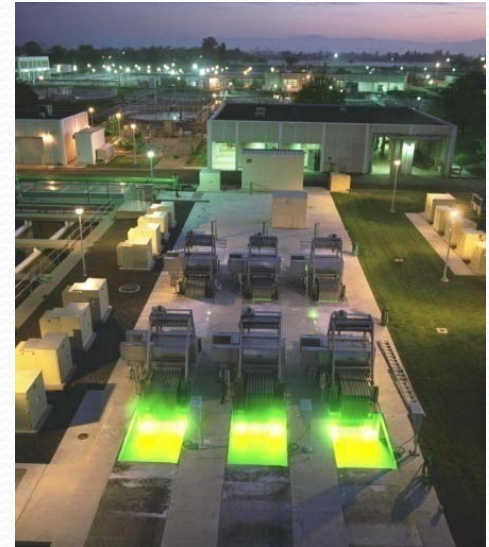


Water and Energy Savings in the CII Sector

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City of Santa Rosa

Overview

- Embedded Energy
- Ozone Laundry Systems
 - Summary of Savings



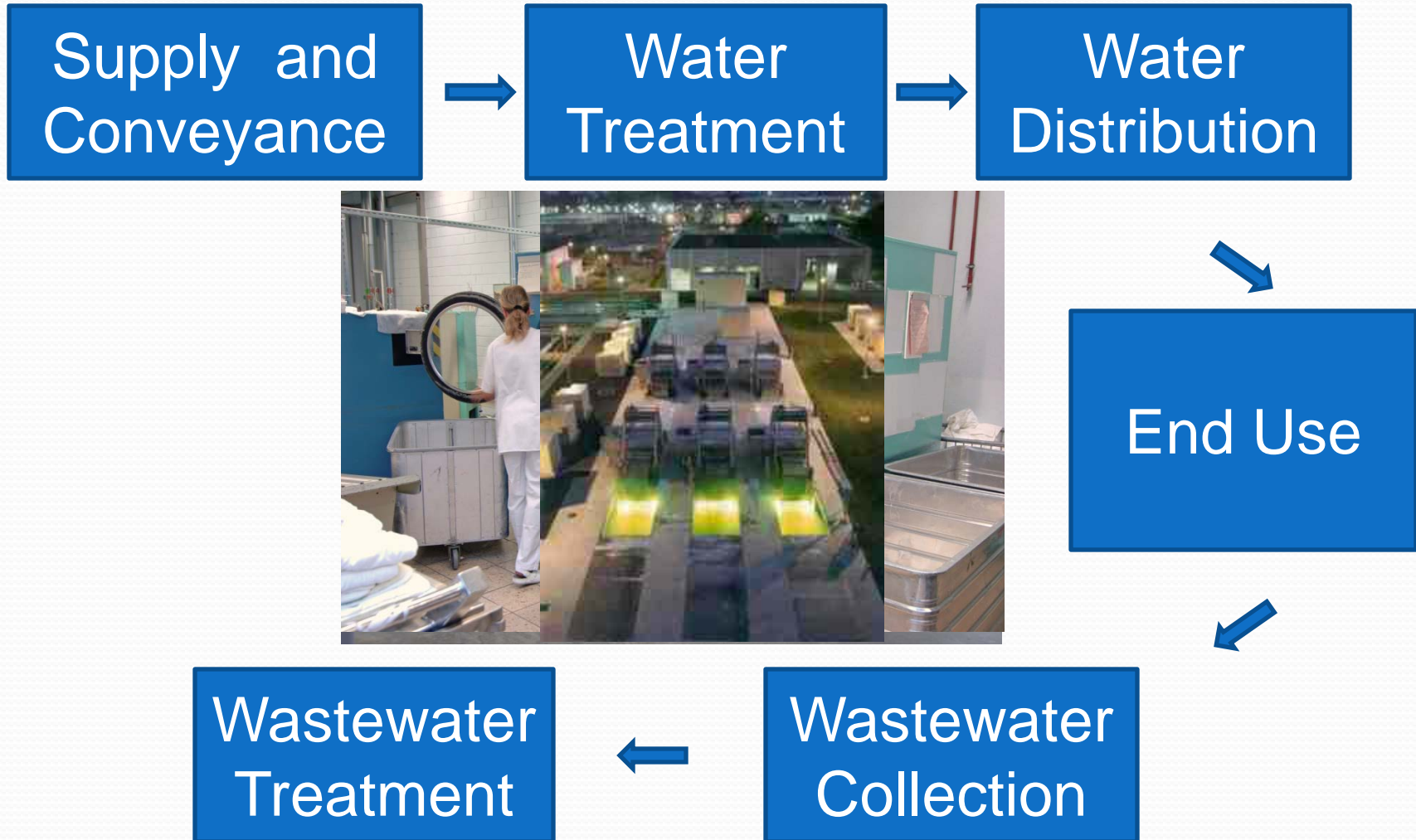
Embedded Energy in Water

In California

- 19% of the Electricity
- 30% of the Natural Gas
- 88 Billion Gallons of Diesel



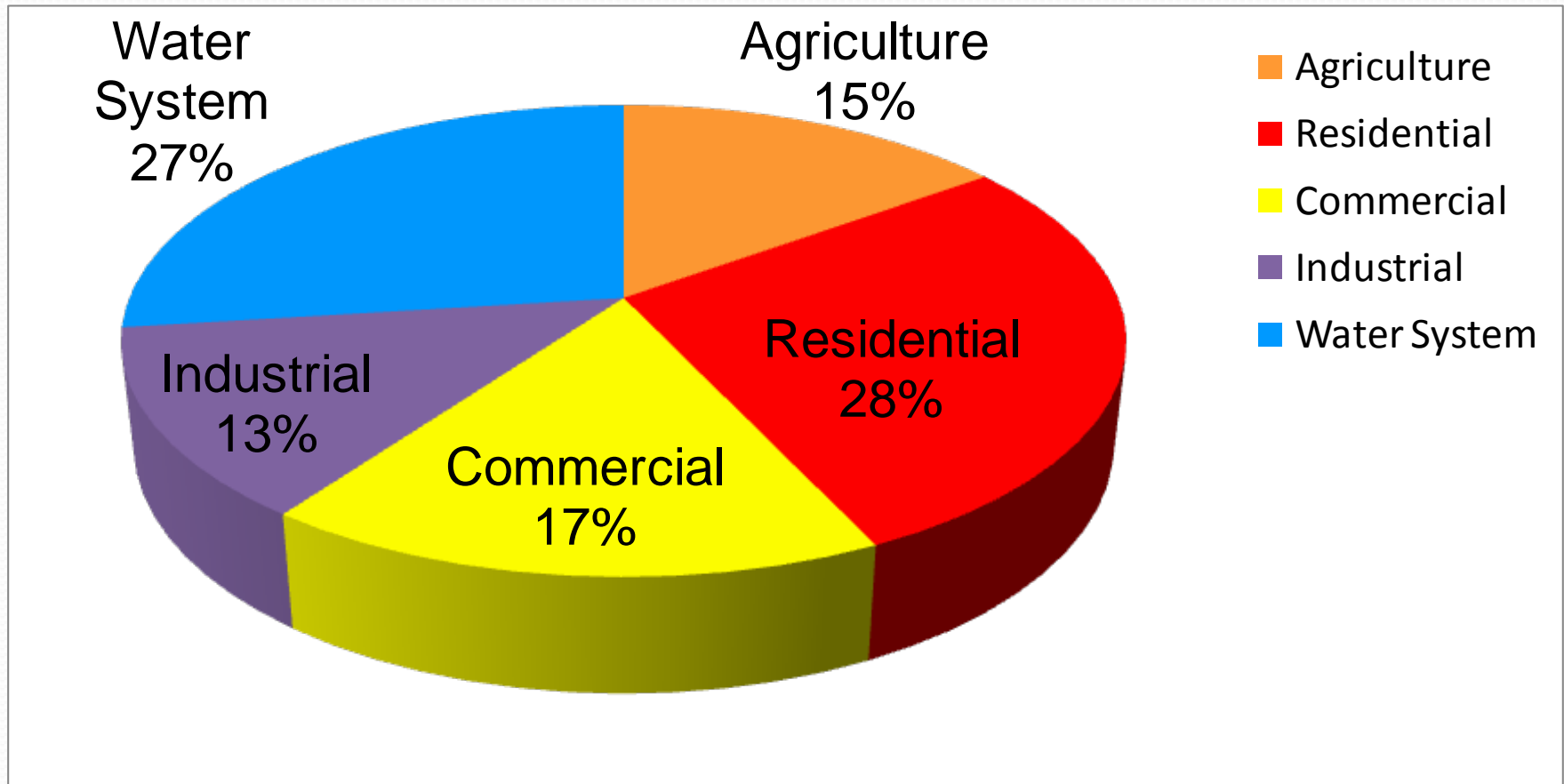
Sources of Embedded Energy



Embedded Energy in Santa Rosa

Activity	Energy per Acre Foot
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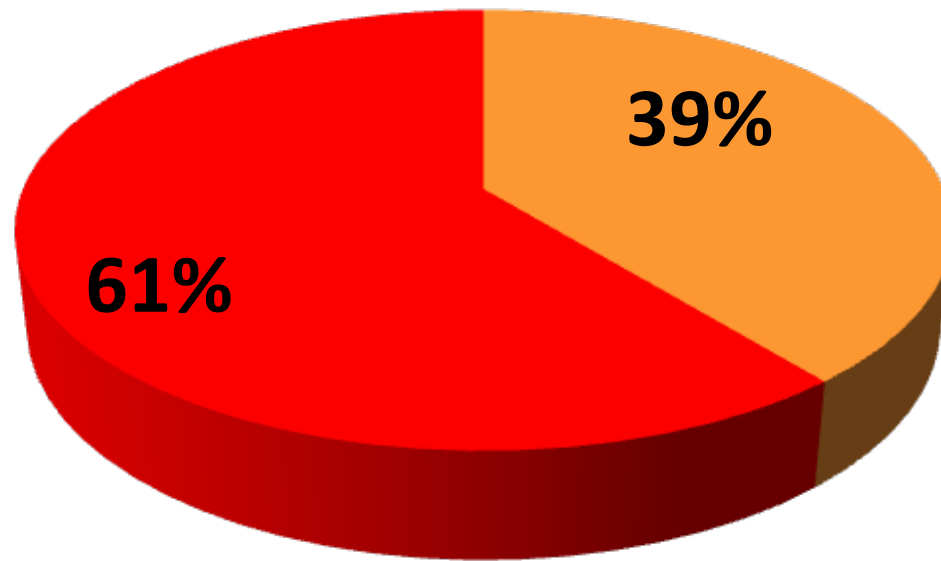
Embedded Energy in California*



Embedded Energy in California

Percent Energy

■ Water Systems and Agriculture ■ End Use



Embedded Energy Pilot Program

- CPUC commissioned study
- Water Utility, Energy Utility and Air Quality Management District
- Measure water savings from water conservation programs and calculate energy savings and greenhouse gas reductions



Technology

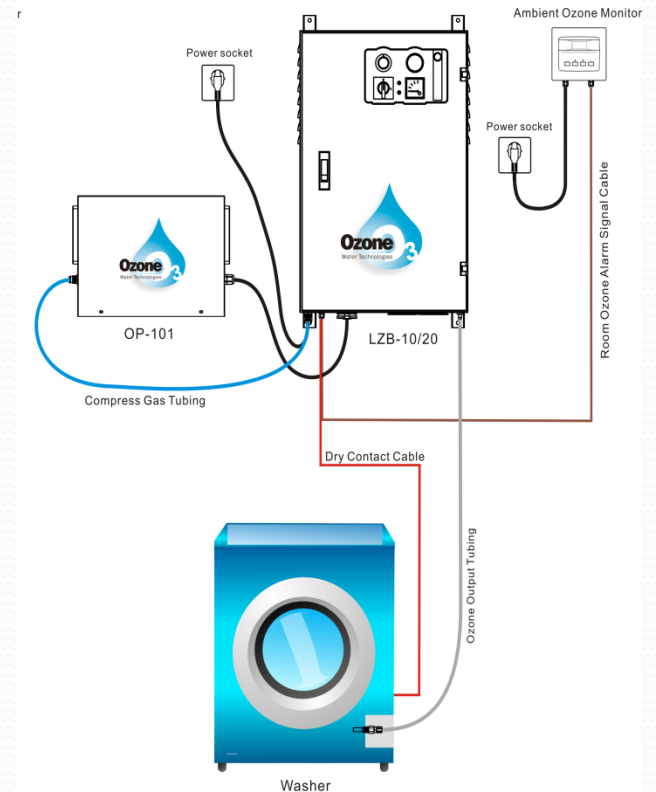
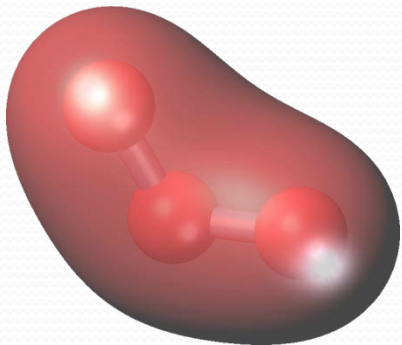
Ozone Laundry System

- Attachment for existing commercial clothes washer
- One ozone generator can be used for multiple washers
- System should produce ozone in solution, not just bubble into the water
- Produce low-levels of ozone in solution



Ozone

- The molecule is 3 oxygen atoms
- Active in cold water
- Limits hot water use
- Used in place of detergents
- Consumed in the washing process, leaving none in the wastewater



Manufacturer Claims

- Saves energy and labor by reducing drying times
- Increases life of linens
- Requires fewer chemicals
- Reduce hot water by 97%
- Saves up to 40% of the water



Study

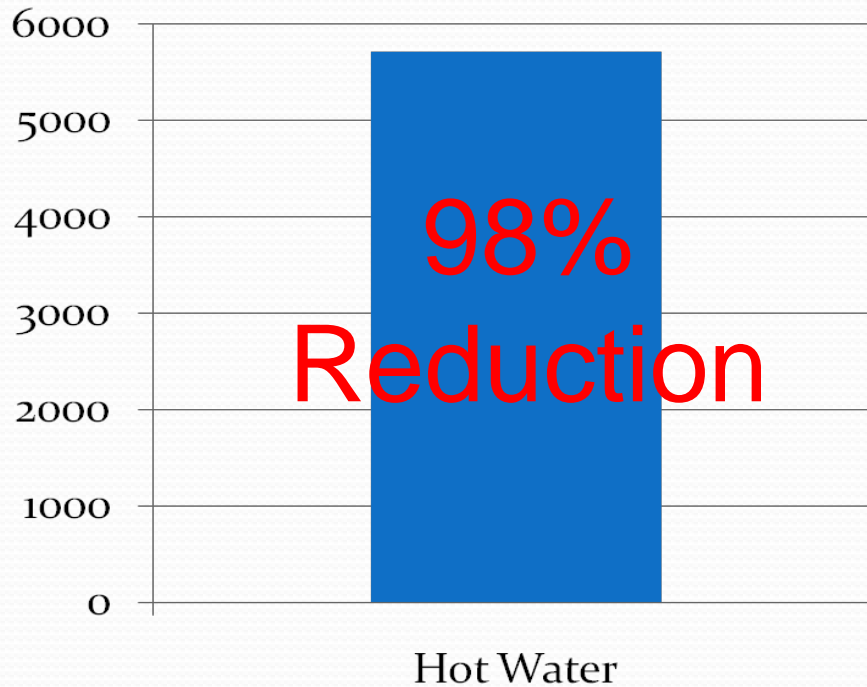
- Study of 15 Hospitality Centers across the State of California
- Clothes washers had water meters on both hot and cold water supplies
- Number of rooms varied from 44 to 805



Savings



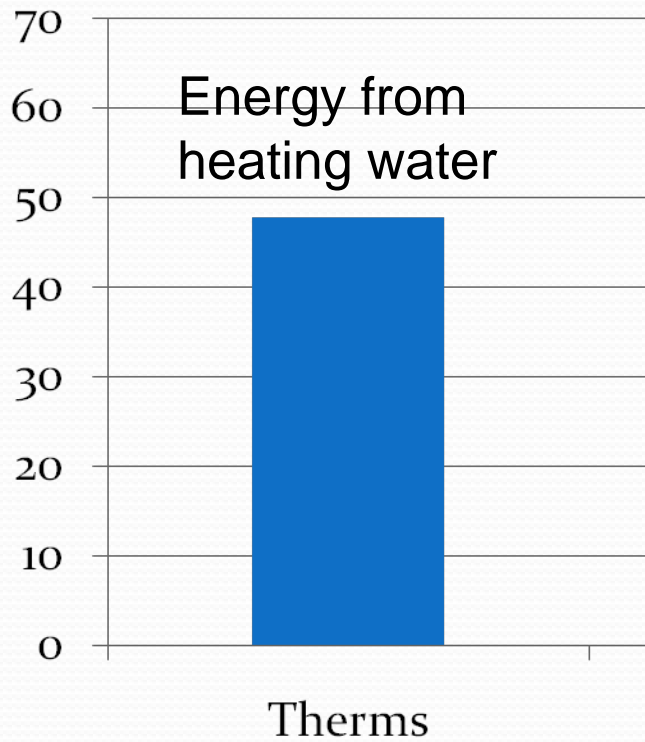
Water Savings Per Room Per Year



2.2 gallons per pound pre installation
1.3 gallons per pound post installation

Savings

Energy Savings Per Room Per Year



Savings

Total Water Savings

- 0.5-18.6 gallons per room per day
- 2,644 gallons per hotel per day
- 39,664 gallons per day for all sites

Average water use of
200 people per day



Savings

Hot Water Savings

- 5.7-26.6 gallons per room per day
- 3763 gallons per hotel/day
- 56,455 gallons per day for all projects

Equivalent to reducing flow rate of 10,000 showerheads



Savings

Natural Gas Savings

- 29.1-119.1 therms per room per year
- 10,500 therms per hotel per year
- 157,500 therms for all projects

Savings

Greenhouse Gas Savings

- 15-84 tons per hotel per year
- 58 tons per hotel per year Average
- 870 tons of GHGs for all hotels per year

Equivalent to removing
125 cars from the Fleet

Financial Incentives

- Annual Gas Savings \$540-\$77,000 (avg. \$15,225)
- Monthly Water and Sewer Savings (avg. \$13,750)
- ROI- without incentives (less than 1 year)
- Other Savings
 - Reduced Drying
 - Linen Replacement

Savings U.S. Hospitality Industry

Type of Savings	Savings Per Year
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* Assumes all hotels use natural gas to heat water

** Assumes all water systems have similar energy inputs per acre foot of water

*** Assumes a similar GHG energy profile as PG&E

Thanks

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