



Reaching Commercial Water Users

An Overview of Denver Water's
Commercial and Industrial
Incentive Programs

***Cindy Moe, P.E., LEED® AP
Industrial Water Conservation Engineer***



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denverwater.org

Overview of Denver Water

- **Population Served – 1.3 million**
- **Annual Water Production – 75 billion gallons**
- **Population**
 - **50% Inside Denver**
 - **50% Suburbs**
- **50% of supply from East Slope**
- **50% of supply from West Slope**
- **Independent Agency of City & County of Denver**



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Why do we care?

- Save potable water for expanding population
- Reduce water costs
- Reduce water pumping costs (energy)
- Reduce water treatment costs
- Reduce wastewater discharge & costs
- Reduce operating costs
- Save money—lots of money & water

Water is our most precious resource, and irreplaceable.

A horizontal banner with a blue background on the left and right sides, and an orange background in the center. The blue areas contain a close-up image of water splashing. The orange area contains the text 'USE ONLY WHAT YOU NEED.' in white, bold, uppercase letters.

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The Denver Water logo, consisting of a stylized white 'D' icon followed by the text 'DENVER WATER' in white, uppercase letters.

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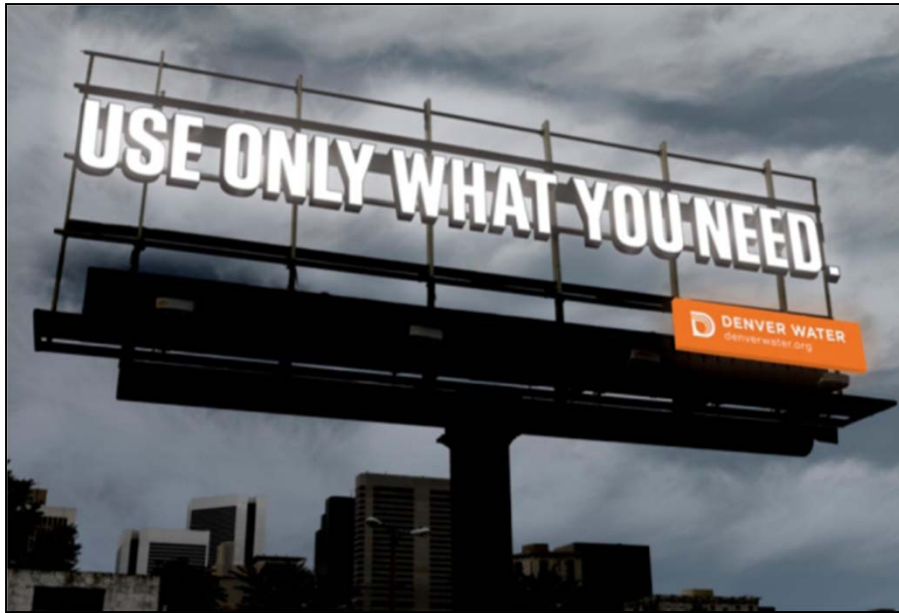
Conservation Methods

- Education and Outreach
- Diagnostics (Audits, Reports Cards, Monitoring Habits)
- Rebates and Incentives (Cash Back for Efficiencies)
- Rules (Water Waste, Soil Amendment, Irrigation Uses)
- Research, Monitoring and Evaluation
- Programs specific to Governments
- Tiered rates mean customers that use more pay more

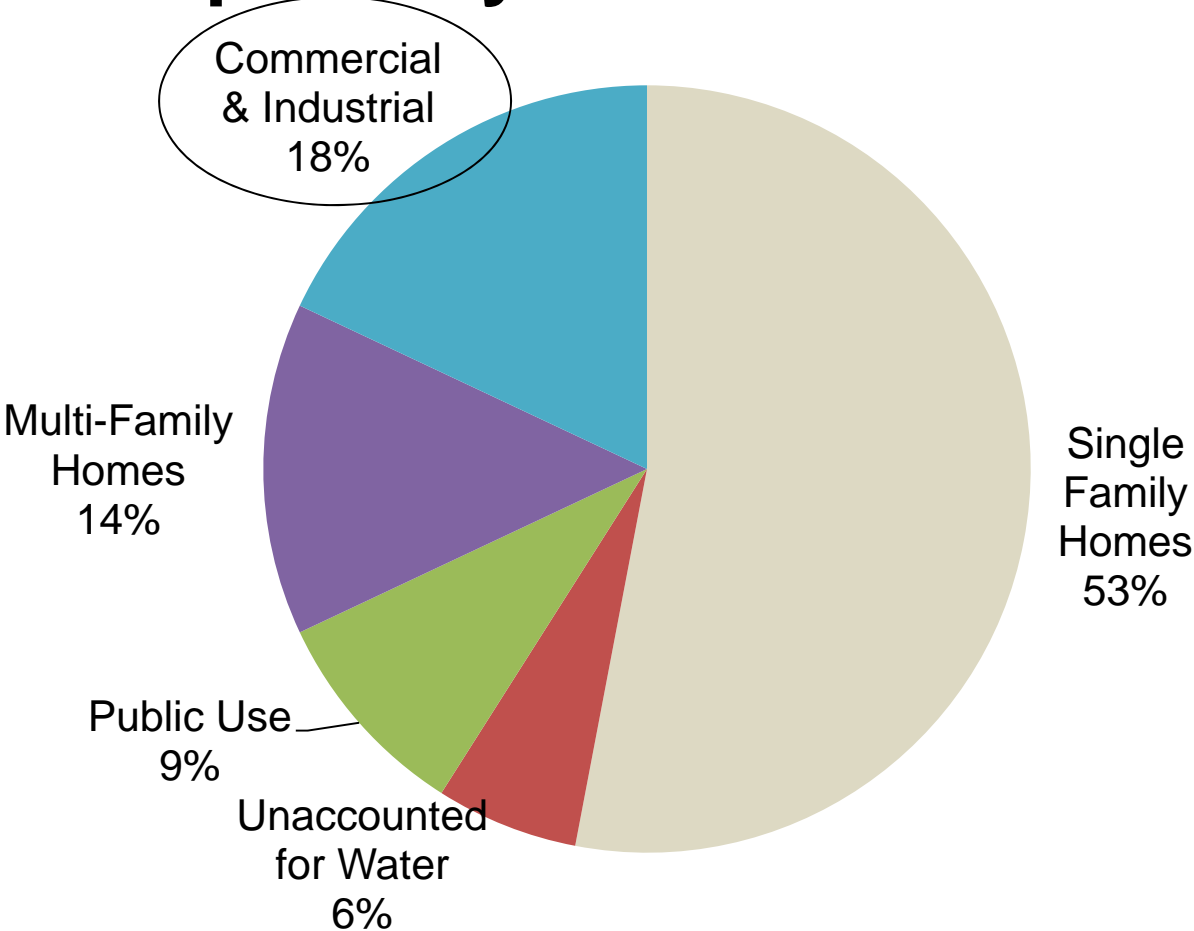


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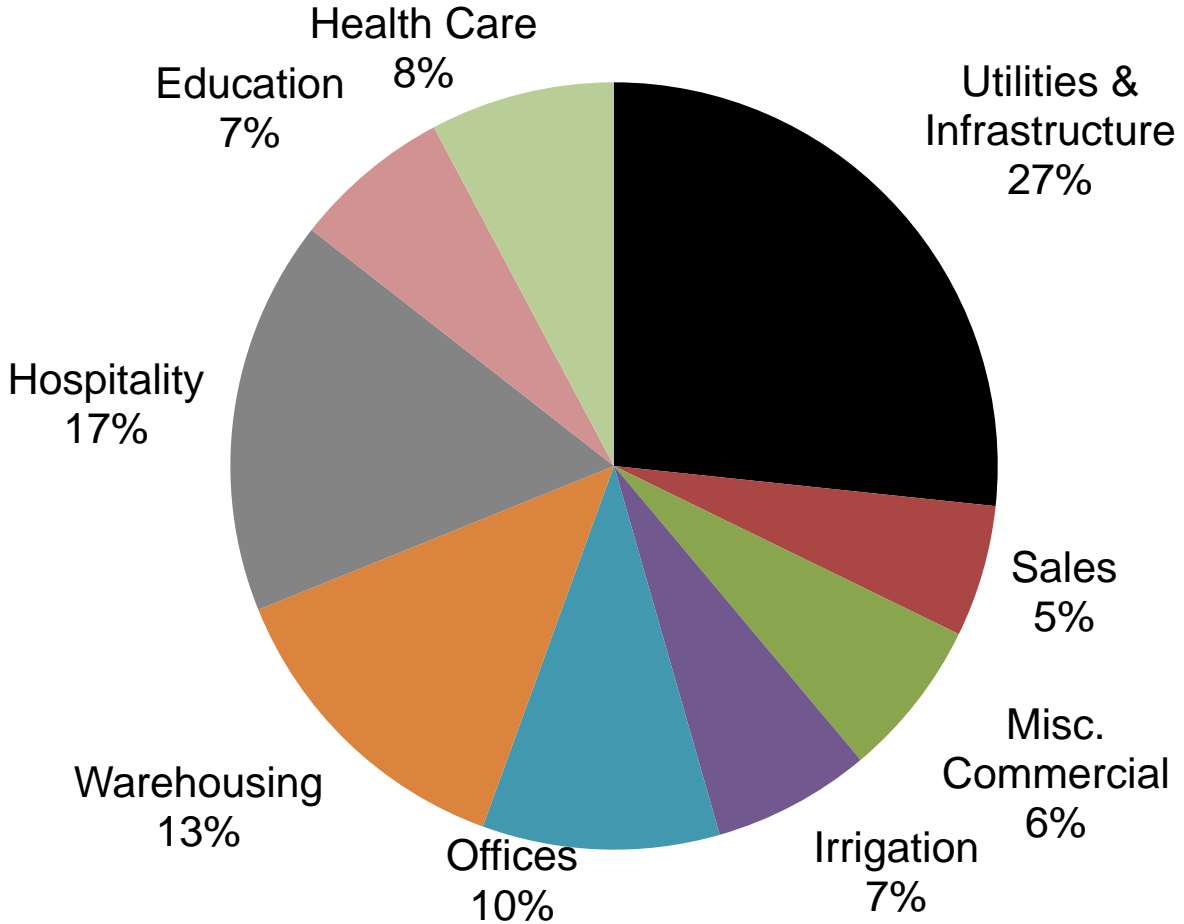
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Denver Water Consumption by Customer Class

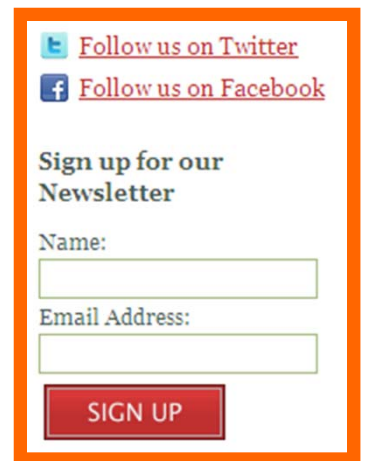


Estimated Distribution of CI Water Use in the United States



Who are your CI Customers?

- **Compile a list of your top users**
- **Visit their websites**
- **Sign up for their newsletters**
- **Follow them on social networking sites**
- **Get to know their business**
- **Partner with other utilities**
- **Make contact**



[Follow us on Twitter](#)

[Follow us on Facebook](#)

Sign up for our Newsletter

Name:

Email Address:

SIGN UP

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Join Forces

- wattstowater.org



WHAT IS WATTS TO WATER?	Simply stated, Watts to Water is an awards and recognition program for energy and water usage reduction.
WHAT DO I GET OUT OF THIS?	The program is open to all metro area office buildings and hotels of 5,000 square feet or more. Participation takes very little time (and energy!) and provides many benefits to you, your team and – the reason we do this – the environment.
WHAT DO I HAVE TO DO?	In 2010, consumption data for 2009 will be compared against the same data for 2008. Participants will enter their energy and water use into ENERGY STAR® Portfolio Manager where it will be shared to a master account creating program-wide comparison and progress data.
<p>*REBATES*</p> <p>-click here-</p> <p>Denver Water Xcel Energy</p>	
	<p>Three awards will be presented to hotels and three to office buildings.</p> <ul style="list-style-type: none"> • Super Saver – a juried recognition for superior achievement in energy and water management emphasizing overcoming unique obstacles and gaining efficiency through no and low-cost practices • Greatest Improvement in Efficiency – recognition for the greatest percentage gain in energy and water performance ratings based on data comparison • Most Efficient Building – Recognition for overall highest energy and water performance rating <p>Don't think your building will qualify for an award this year? Get started anyway! Entering and sharing your data will set the benchmark for comparison in future years. Continue to add monthly usage data throughout 2010 and following years. You'll be able to monitor your progress and a Watts to Water award just might be in your future.</p>



A Partnership between NAIOP Colorado, Denver Water and Xcel Energy



- www.naiop-colorado.org/resourcesmart.html



Organizations & Tradeshow

- **Colorado Restaurant Association (CRA)**
- **Advanced Facilities Management & Engineering Conference (AFEC)**
- **Colorado Hotel & Lodging Association (CH&LA)**
- **Building Owners and Managers Association (BOMA)**
- **Commercial Real Estate Development Association (NAIOP)**
- **American Beverage Association (ABA)**
- **Western Carwash Association (WCA)**

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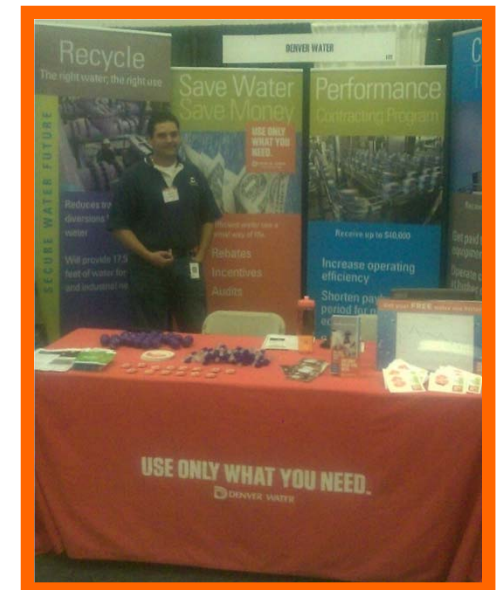
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Benefits of Joining Organizations

- **Contribute articles to their newsletters**
- **Advertise in their publications**
- **Present at their meetings**
- **Attend their trade shows**
- **Network!**

- **And then.... make contact.**

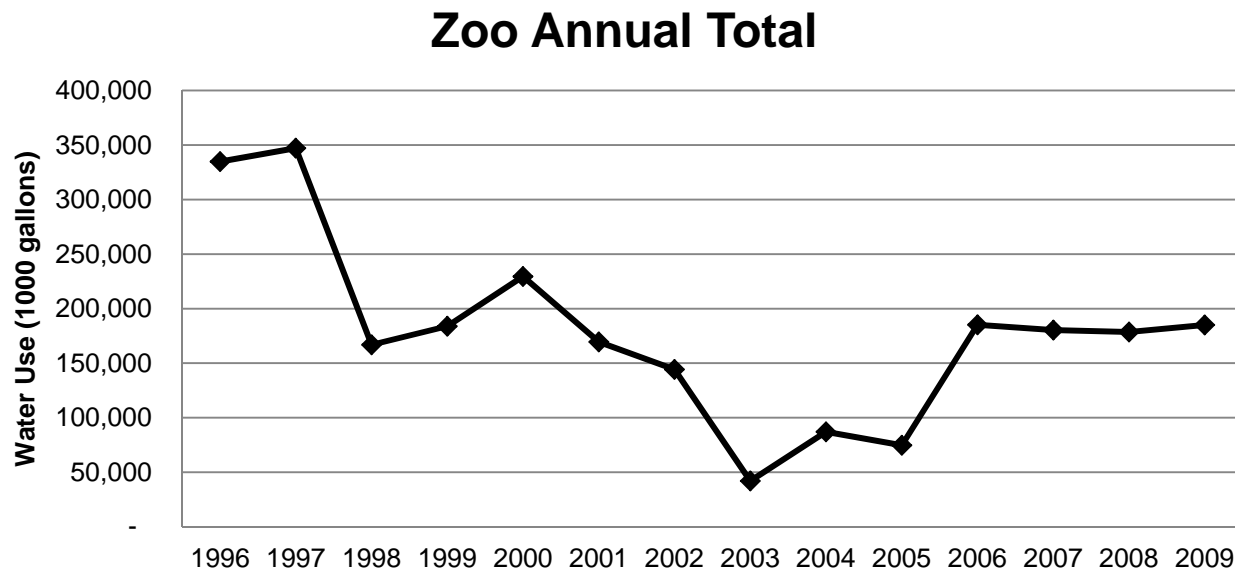


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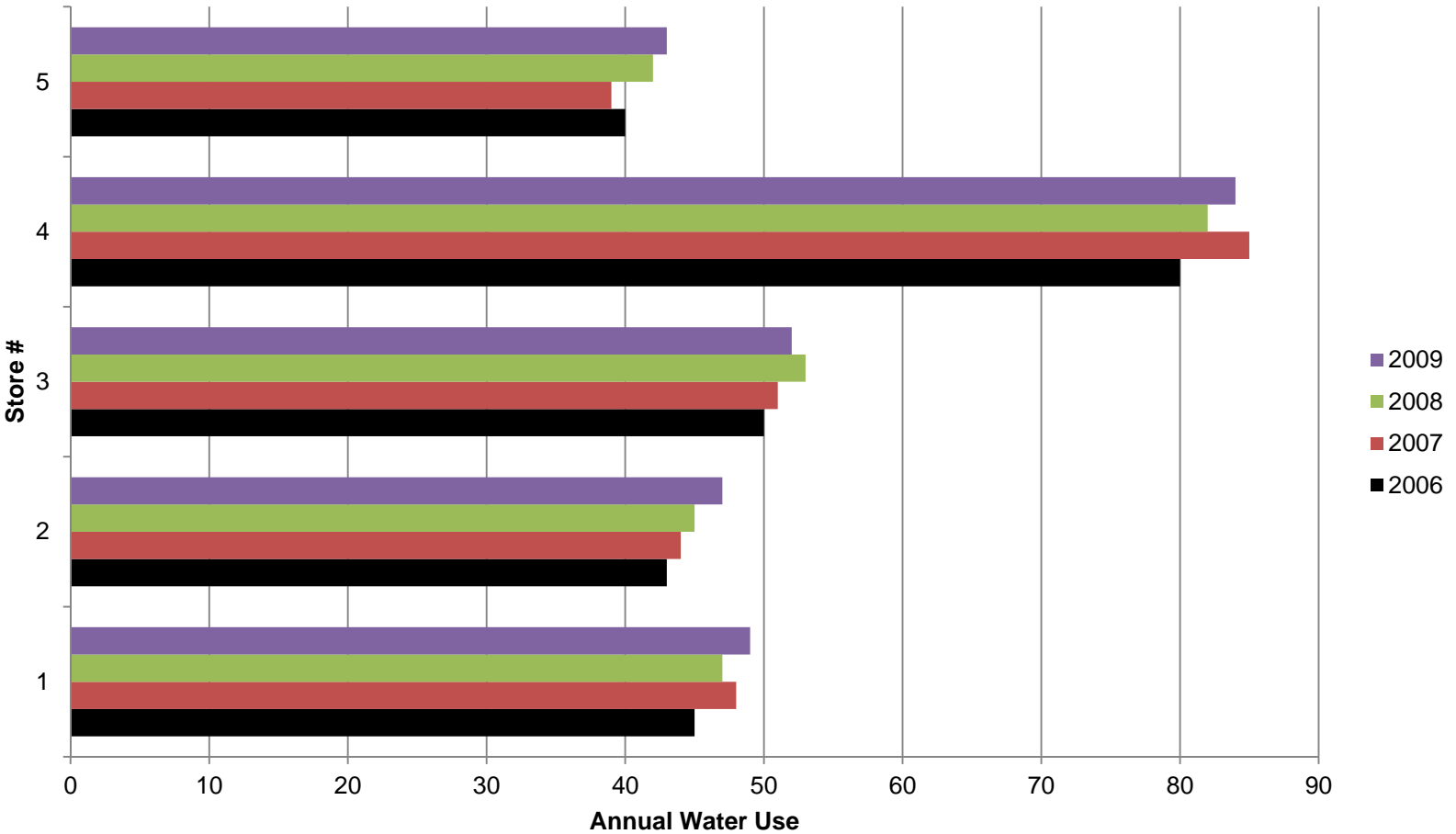
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Make Comparisons

- **Prior to 1998, the Denver Zoo used the same amount of water as the LA Zoo, even though the Denver Zoo is half the size.**



Comparisons by Franchise



Take Advantage of Opportunities

- **2008 Democratic National Convention in Denver**
- **Office of Economic Development**
- **Greener Denver Independent Network of Restaurants (DINR)**



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Quarterly e-Newsletter



SMART WATER USE
Tips for industrial and commercial conservation



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Dollars and Sense

Cost –effective water conservation measures pay for themselves in reduced utility and energy bills, but there are additional reasons to make changes that makes sense and provide benefits:

- **High Visibility** – communicate your commitment in a very public way
- **Ease of implementation** – Measures that can quickly be enacted are a good way to show that you are serious about saving water
- **Employee/customer goodwill** – generate positive relationships

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2010 Denver Water CII Rebates

Rebate	Rebate Amount
Urinal ½ Gallon per Flush Retrofit	\$25
High Efficiency Urinal (NC)	\$200
Multi-Family/Commercial Multi-Tenant Sub-Metering (NC)	\$40
Water-Cooled Equipment Replacement (Ice machines)	\$450
Car Wash Equipment (NC)	\$100
Cooling Tower Conductivity Controller (NC)	\$500
Cooling Tower Make-Up or Bleed Meters (NC)	\$50
Coin-Op Laundry Equipment (NC)	\$150
Boilerless Steamers (NC)	\$350
High Efficiency Toilets, including Flushometer (NC)	\$125
Commercial Warewashing Equipment & Monitoring	\$300 + \$50
Commercial Meter & Meter Reading System	25% + \$150

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Commercial, Industrial & Institutional Incentive Program

- Receive up to \$40,000 for improving the efficiency of your processes
- Projects earn \$21.50/kgal of water saved over a one-year period.
- Projects must meet the minimum savings requirement of 100,000 gallons per year in order to qualify.
- Types of projects that qualify include elimination of single-pass cooling, cooling tower modifications, industrial laundry equipment upgrades, re-use applications or installation of water efficient equipment, and many more.

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Case Study #1

Commercial Laundry

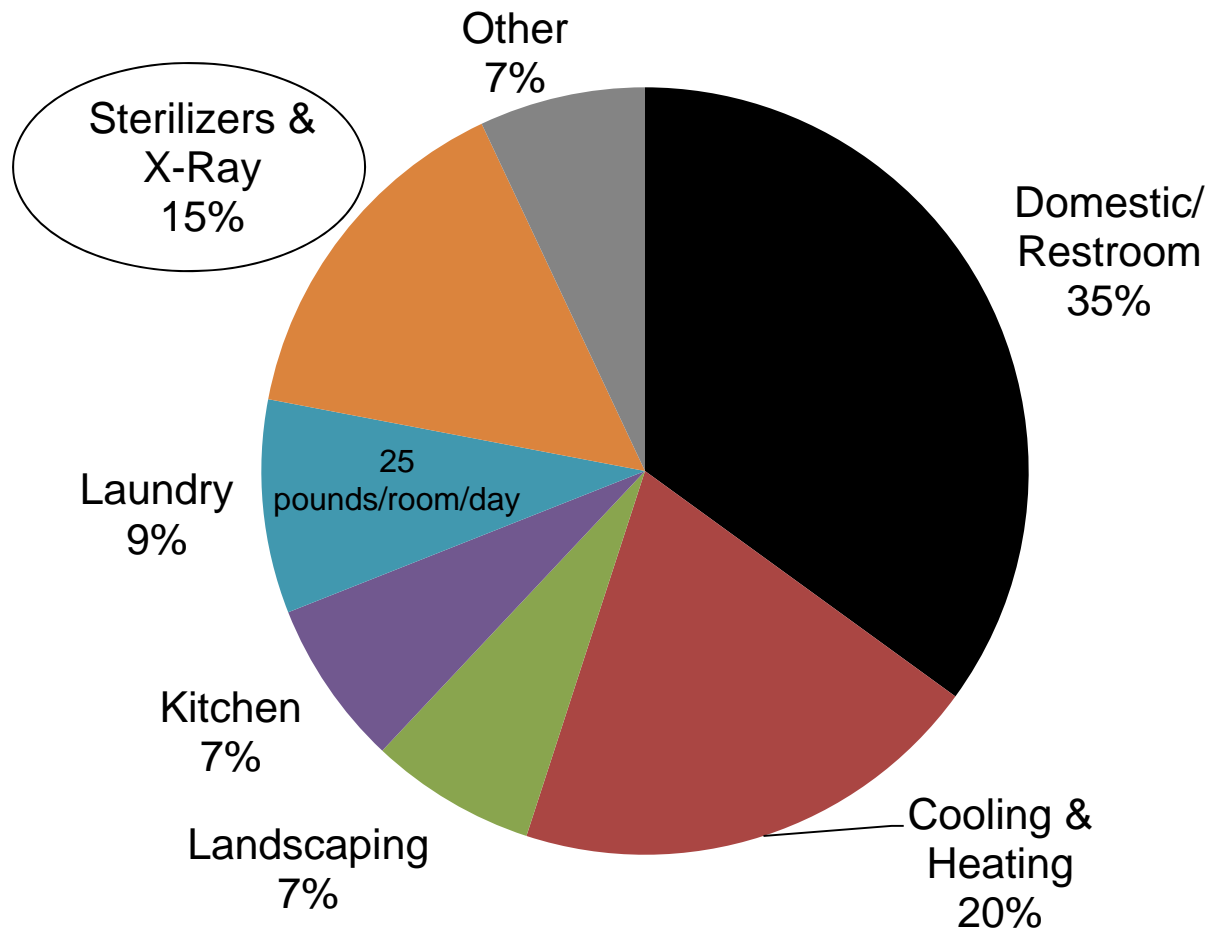


- 10 Commercial Washing machines circulated cold water pipes to keep the machines' hot oil from overheating
- 1,000 gallons of water per machine went down the drain each day
- New piping allows water to be recirculated into a storage tank
- Saving roughly 3.4 million gallons of water and \$20,000 on water & sewer bills annually
- \$40,000 incentive from Denver Water

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End Uses of Water in Hospitals



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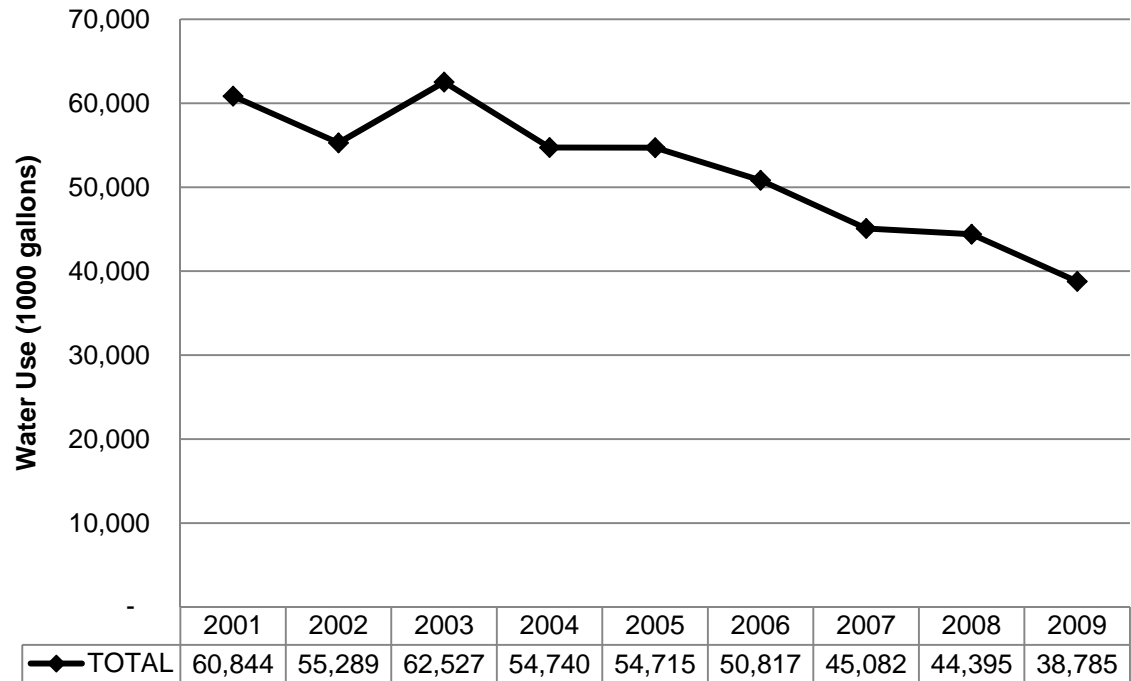
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Case Study #2

Hospital Sterilizers



- Eliminates water tempering during cycles, which is necessary before draining hot water into local drains
- 2.0-3.8 gpm constant flow BEFORE retrofit
- 0.3 gpm AFTER retrofit
- 34% reduction in overall use!



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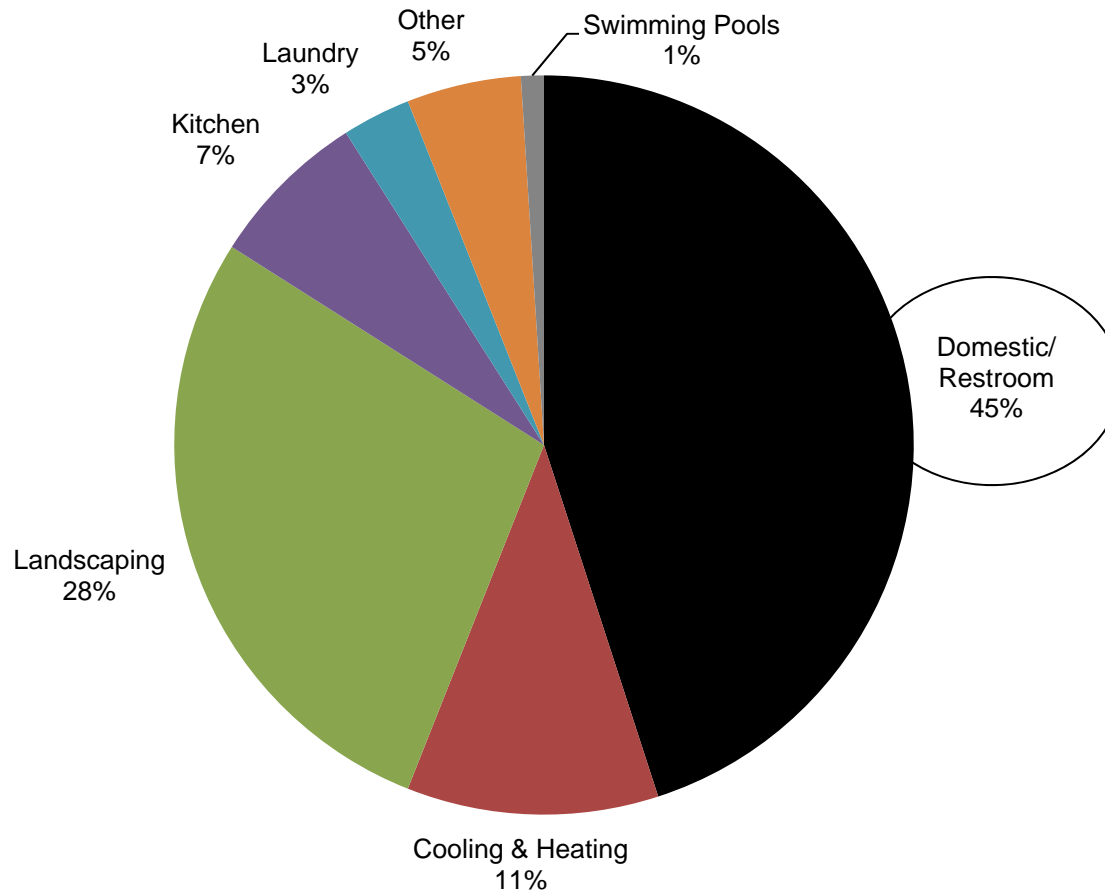
Estimated Payback

- **Recirculating sterilizer cooling water:
2.0-3.5 years**
- **X-Ray Water Recirculating Units:
2.3 years**

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End Uses of Water in Schools



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Name: Makenzie

Thank you Denver Water

I like the toilet becus it

I like the seack becus it



flos fast

Name: Sam

Thank you Denver Water

I like the toilet becuz it

I liked the toilet bec cuz it



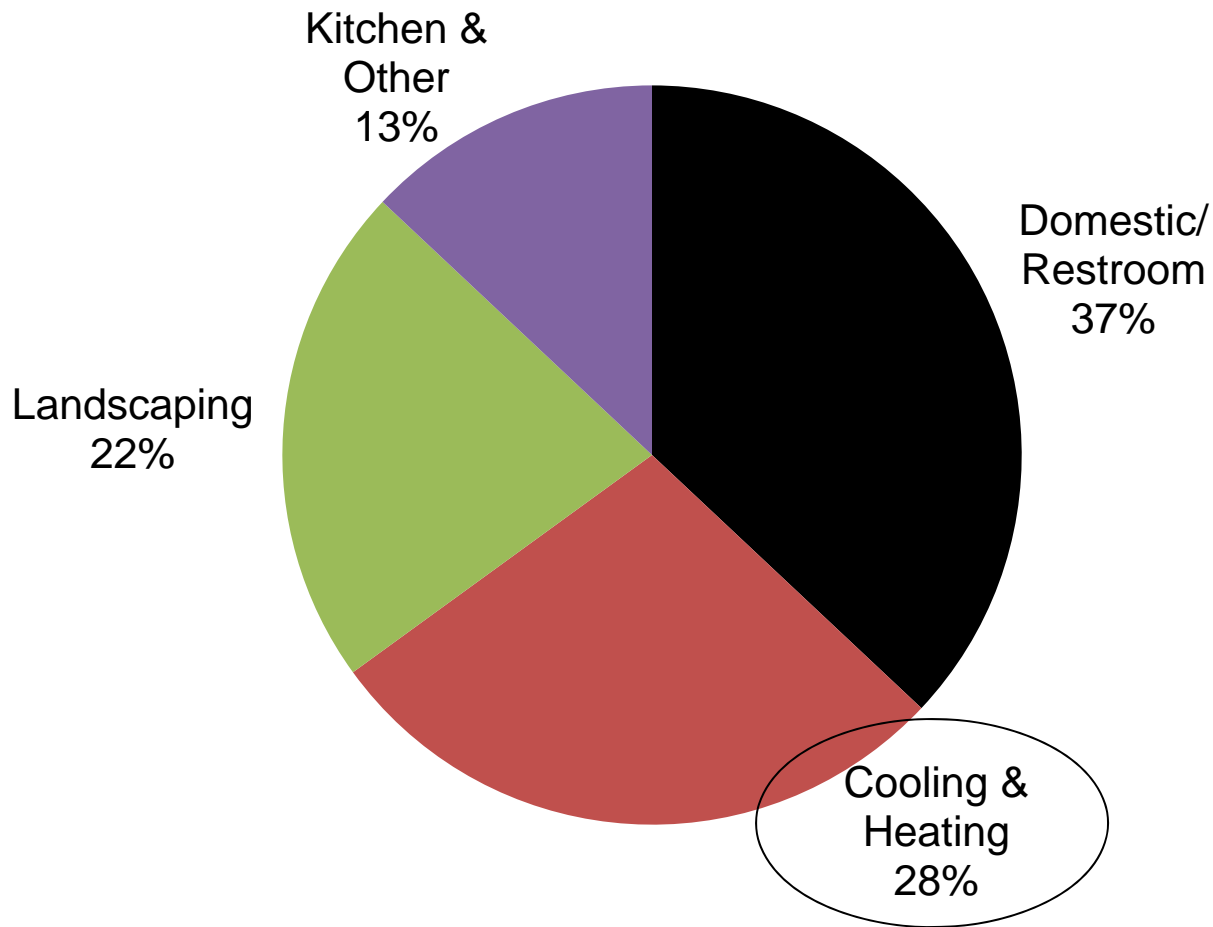
Indoor and Outdoor Water Use and Savings

	Historic Average Water Use (kgal/yr)	Potential Water Savings (kgal/yr)	Potential Annual Cost Savings (\$/yr)	Estimated Costs (\$)	Incentives (\$)	Potential Percent Water Reductions (%)	Simple Payback (years)
DPS							
Outdoor	379,727	47,792	\$129,900	\$805,100	TBD	13%	7
Indoor	119,778	57,417	\$308,945	\$3,542,400	\$1,483,600	48%	7
Total	499,505	105,209	\$433,845	\$4,347,500	\$1,483,600	21%	7
Jeffco							
Outdoor	265,576	6,839	\$26,300	\$499,300	TBD	3%	19
Indoor	81,839	31,539	\$199,452	\$2,100,014	\$1,627,196	39%	2
Total	347,415	38,378	\$225,752	\$2,599,314	\$1,627,196	11%	4

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End Uses of Water in Office Buildings



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Water Treatment Programs

- Traditional chemical treatment
- Green chemical treatment
- Physical water treatment



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Cooling Tower Incentive Program

- Improve efficiency from 6.0 cycles of concentration to 32.0 (or more!) cycles
- Example:
 - Savings of 895,000 gallons per year
 - \$4,280 saved on water & sewer bill (not to mention chemical costs!)
 - \$19,235 incentive from Denver Water



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Cooling Tower Workshops

- **2007 & 2009**

Cooling Tower Water Conservation Workshop

Presented by Paul Puckorius of Puckorius & Associates
Sponsored by Denver Water

Learn how to conserve water with your cooling tower systems, reduce your water bill and earn Denver Water rebates at this practical, how-to workshop. Topics include green chemicals and non-chemical treatment.

Wednesday, Dec. 9, 2009
8 a.m. - 4 p.m.

Police Protective Association Event Center, 2105 Decatur St., Denver, CO 80211
Cost is FREE! Lunch and refreshments are included at no cost

To register, e-mail jason.millheim@denverwater.org or call 303-628-6067 by Dec. 1.
Don't wait. Space is limited to 100 attendees.

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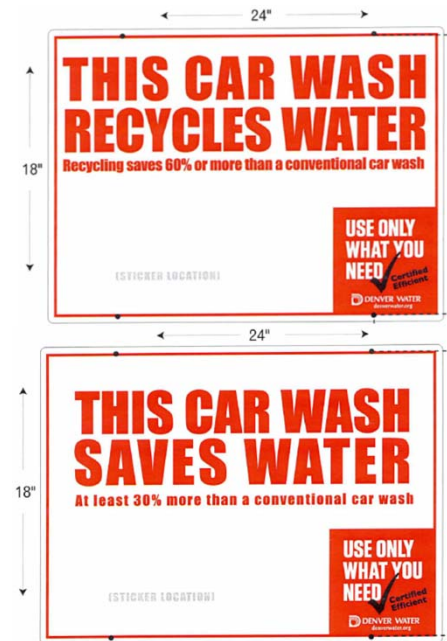
If you are unable to attend and want to receive Denver Water rebate or incentive program information, e-mail jason.millheim@denverwater.org

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Car Wash Certification

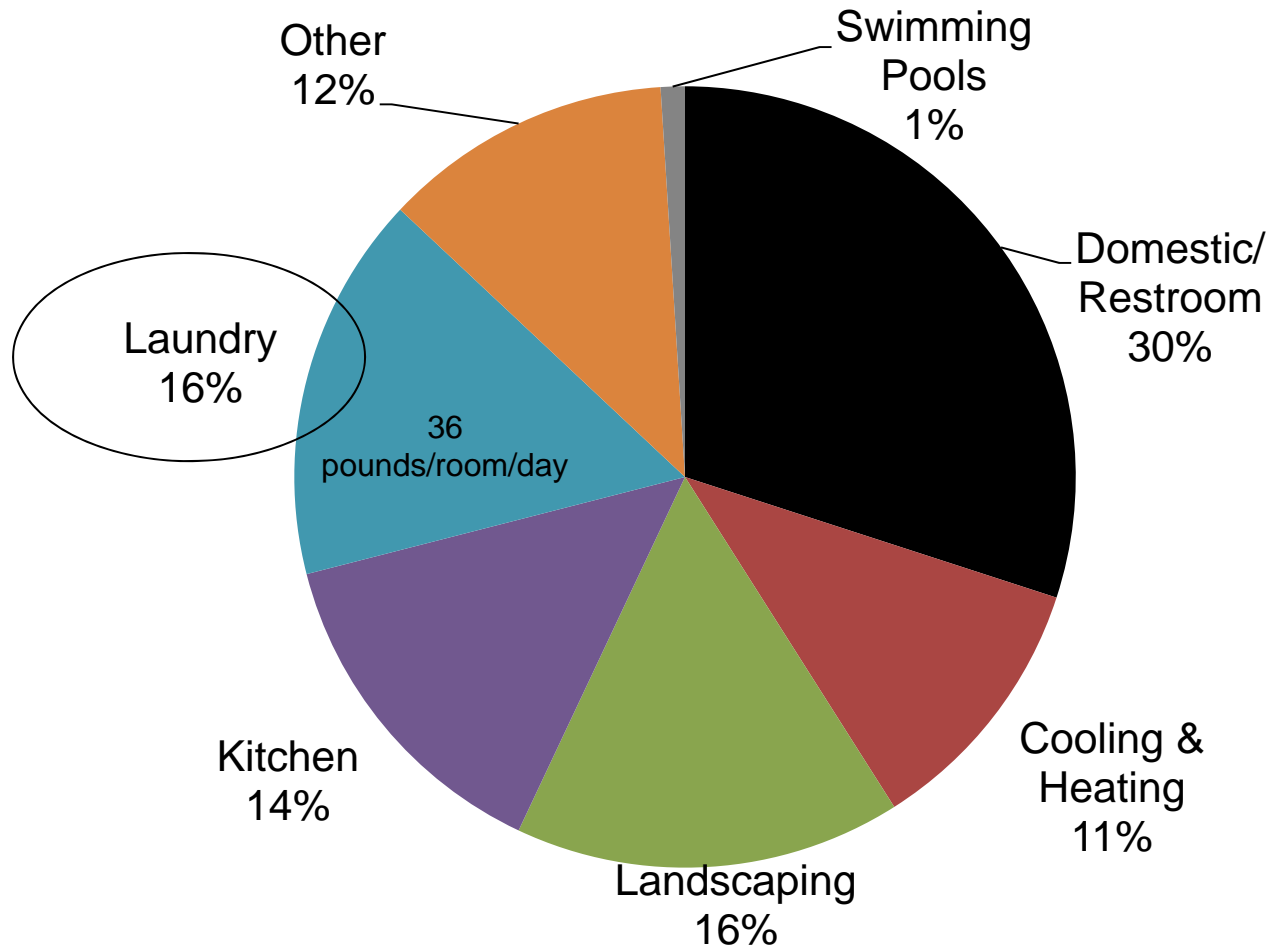
- Approximately 300 car washes in service area
- Goal:
 - 30% reduction
 - 60 gallons per wash on top cycle
- Nozzle retrofits (rebate \$1/nozzle)
- Timing/cycle adjustments
- Recycle retrofits



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End Uses of Water in Hotels



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Hotel Program



PLEASE CHANGE THE LINENS TODAY

The Project Planet program is an effort of this hotel to protect the environment through conservation of water and decreased use of detergent.

If you are staying with us more than one night, as part of the Project Planet program, we will launder your linens every three days.

If you would prefer not to participate in this program, simply leave this card on your pillow and linens will be changed today.


As always linens are automatically changed after every guest check-out.

USE ONLY WHAT YOU NEED.

PROJECT PLANET

We appreciate your help! Printed on recycled paper. Laminated to reduce waste.

PLEASE REUSE THE TOWELS



We invite you to join with us to conserve water by using your towels more than once.

In addition to decreasing water and energy consumption, you help us reduce the amount of detergent waste water that must be recycled within our community.


Please hang the towels up if you wish to participate in the program — if not, simply leave them on the floor.

USE ONLY WHAT YOU NEED.

PROJECT PLANET

We appreciate your help! Printed on recycled paper. Laminated to reduce waste.

- **Benchmarks:**
 - 79-165 gal/ft²
 - 30,200-39,500 gal/room



Conserve water & energy...

We invite you to join with us to conserve water by using your linens and towels more than once. In addition to decreasing water and energy consumption, you help us use fewer chemicals and reduce the amount of detergent waste water that must be recycled within our community.

Help us in protecting the earth's natural resources for future generations to use and enjoy.

...Use only what you need.

Water is a precious natural resource in Colorado's semi-arid climate. Be part of Denver's conservation culture by using water wisely.

Sustainability is a core value in Denver City Government. Greenprint Denver is a long-term, citywide initiative to promote the importance of sustainable development and ecologically friendly practices throughout the community, including the wise use of water.

Always drink lots of water when you are in Colorado to avoid dehydration and altitude sickness - but please don't waste it. Denver's drinking water is supplied to our treatment plants entirely from our Rocky Mountain watershed.

Men's Health magazine ranked Denver's tap water as the cleanest in the country in 2007. Denver's water tastes great, so fill your glass or water bottle from the tap and drink up!

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You CAN CHANGE THE WORLD

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Ozone Laundry

- **Ozone is three oxygen atoms combined into one unstable molecule**
- **Ozone reacts with odors, stains, and other organic material in the wash**
- **Water temperatures can be reduced – works best at around 80 degrees F**
- **Reduces energy use, detergent & chemical use, and water use (less rinsing)**

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Estimated Payback Periods

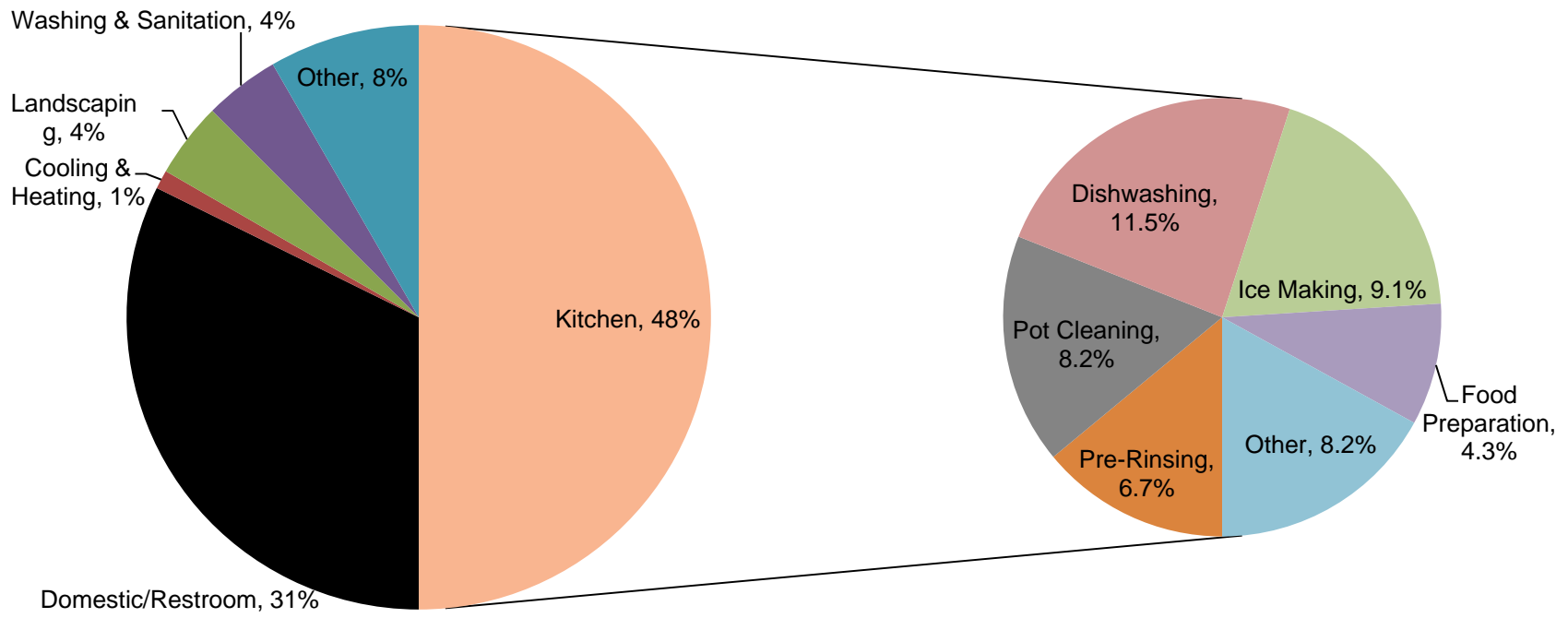
- **Install low-flow showerheads in hotel rooms:
0.9 years**

A horizontal banner at the bottom of the slide. The left and right sides feature a blue background with white water splashes. The center has an orange background with white text.

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End Uses of Water in Restaurants



Restaurant Program

- **Pre-Rinse Spray Valves**
 - 15,600 gal/year savings after retrofit
- **Water Upon Request Signs**
- **Benchmarks:**
 - 170-210 gal/ft²
 - 10,600-14,300 gal/seat



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Commercial Kitchen Operations

- **Dishwashers – meet CEE standards**
 - Undercounter: 1-1.8 gal/rack
 - Stationary Single Tank Door: 1.1-2.2 gal/rack
 - Single Tank Conveyor: 0.7-1.4 gal/rack
 - Multi Rank Conveyor: 0.54-1.2 gal/rack
- **Pre-rinse Spray Valves**
 - Traditionally 2-5 gpm
 - High Efficiency 1.6 gpm or less
- **Commercial Steam Cookers**
 - Traditionally 25-35 gal/hr
 - High Efficiency Energy Star cookers 2 gal/hr

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Commercial Kitchen Operations

- **Ice Machines**
 - Water cooled units can use 150 gal/100 lbs of ice
 - Air cooled units can use 25 gal/100 lbs of ice
- **Garbage Disposals**
 - Minimize or eliminate
 - Use strainers or traps – compost!
- **Refrigerators & Freezers**
 - Use air-cooled, energy efficient equipment
 - Adequate refrigerator space for thawing food

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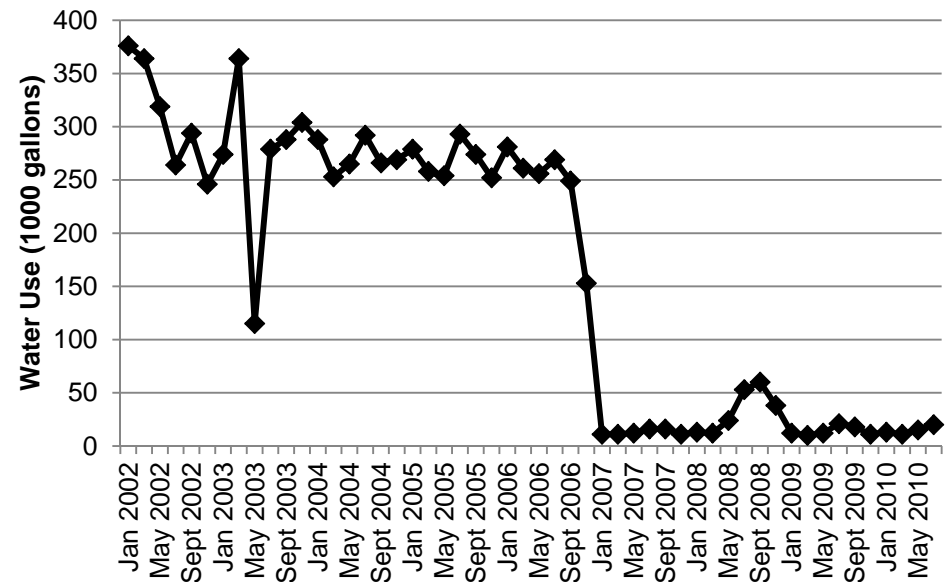
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Case Study #3

Restaurant Water-Cooled Compressor

- **Cost of new air-cooled compressor: \$9,000**
- **Saving 1.3 million gallons per year, or \$6,000 in water & sewer bills**
- **Earned \$20,000 incentive**



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Estimated paybacks

- **Installing HET: 4.7 years**
- **Closed loop on Refrigeration condenser: 1.7 years**
- **Pre-rinse nozzles: 0.4 years**
- **Dishware sensing gate: 0.4 years**
- **Water-efficient dishwashers: 1.9 years**

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Other Examples

- **Bakery**
- **Brewery**
- **Grocery stores**
- **Beverage manufacturer**
- **Dairy, meat, fish & poultry processing**



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Other Commercial

- Multi-Family
- Housing Authorities
- Non-Profits
 - Shelters
 - Religious Organizations



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Future Programs



**Water Efficiency in the Commercial and Institutional Sector:
Considerations for a WaterSense Program
August 20, 2009**

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Recycled Water

- Viable alternative to domestic water
- Not available in all areas—yet!
- Denver uses recycled water for irrigation of parks, golf courses, zoo, & power plant cooling towers



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Irrigation System Audits & Rebates



55% of the water Denver Water supplies is used outdoors, primarily for irrigation

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Obstacles

- **Lack of customer capital or awareness of financial assistance**
- **Relatively low water costs**
- **Expected payback or return on investment of less than 2 years**
- **Lack of metering for individual units**



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Recommendations

- **Proper water pricing (including wastewater) & permitting**
- **Encourage smart management practices**
- **Educate decision makers about conservation opportunities**
- **Tout achievements**
- **Financing schemes similar to energy**
- **Require individual water meters with billing based upon actual water use**



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Resources

- Study of Potential Water Efficiency Improvements in Commercial Businesses – EPA, April 1997
- Water Efficiency Manual for Commercial, Industrial & Institutional Facilities – North Carolina Dept. of Environment & Natural Resources, May 2009
- Making Every Drop Work: Increasing Water Efficiency in California's Commercial, Industrial & Institutional (CII) Sector – NRDC, 2009
- Waste Not, Want Not: The Potential for Urban Water Conservation in California – Pacific Institute, November 2003
- Watersmart Guidebook: A Water-Use Efficiency Plan Review Guide for New Businesses – EBMUD, 2008
- A Water Conservation Guide for Commercial, Institutional and Industrial Users – New Mexico Office of the State Engineer, July 1999

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