

# ***Top 5 New and Innovative Water-Efficient Products - 2010***

*by*

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*May 12, 2010*

*2010 IAPMO / WPC Emerging Technology Symposium  
Ontario, California*



## **Disclaimers**

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- ✓ The authors (Gauley & Koeller) have no special interest, financial or otherwise, in the products, technologies, companies, or organizations manufacturing, promoting, or selling the products described in this presentation.
- ✓ This presentation identifies those products that, **in the authors' opinion**, are innovative, and likely to result in substantial water savings.



## Criteria for selection...

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- ✓ Indoor water use reduction (irrigation is another matter)
- ✓ Residential and non-residential applications
- ✓ Generally available in the marketplace
  - A product, technology, or program
  - Can be a new approach to an old application
  - *But*, no "ideas" or undeveloped products
- ✓ Water use can be determined
  - Field *or* laboratory - "real world" preferred
- ✓ Potential for significant, long-term impact
  - Regional *or* all of North America
  - Potable *or* non-potable water

2010 IAPMO / WPC Emerging Technology Symposium - May 11-12, 2010



## How did we select?

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- ✓ Work with manufacturers & industry leaders
- ✓ Feedback from water utilities & water efficiency practitioners
- ✓ Laboratory and field testing by Veritec, Koeller, & others
- ✓ Interviews with other stakeholders...
  - Green building advocates
  - WaterSense® implementation team members
  - Facilities managers and property owners

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# So, let's get started!!!!

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## #5 High-Efficiency Commercial Dishwashers

- ✓ 150,000 high-capacity DWs in N.A.
  - Conveyor & Flight-type
  - Many over 15 years old
  - Energy costs driving machine efficiencies

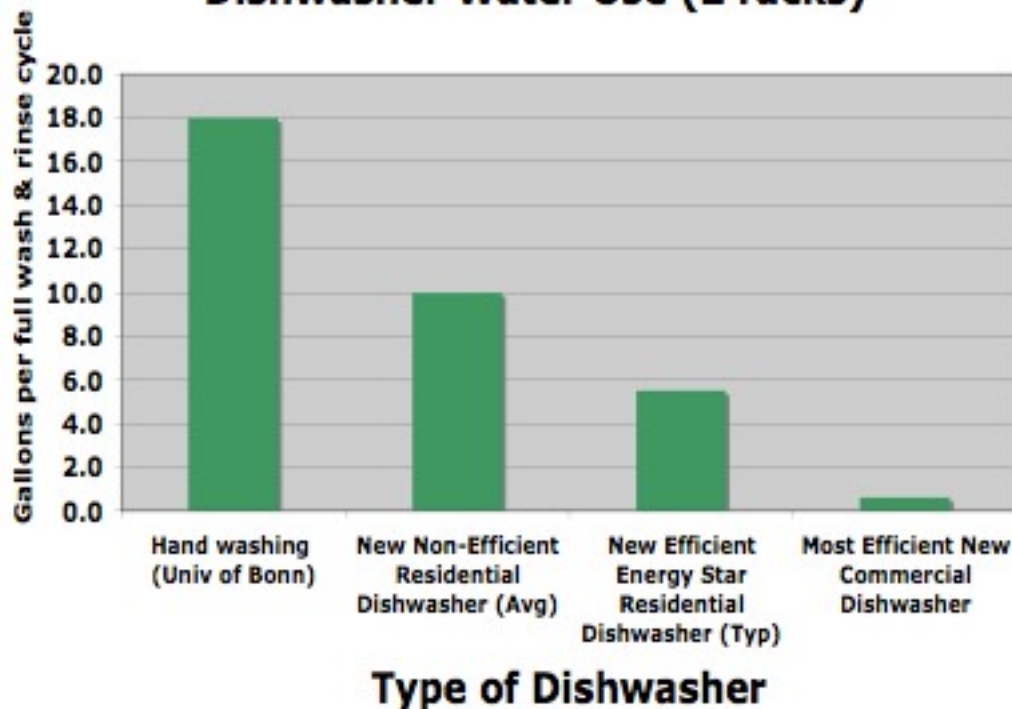


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# #5 High-Efficiency Commercial Dishwashers

- ✓ Evolution of hot water use efficiency to wash, rinse, sanitize
  - 1990s - 2.5 gallons per rack (9.5 Litres)
  - 2000 - 1.2 gallons per rack (4.5 Litres)
  - **2010 - 0.3 gallons per rack (1.1 Litres)**
- ✓ Standard DW 'rack' - 20" x 20" (500 mm x 500 mm)
  - Capacity equivalent = ~30 plates

## Dishwasher Water Use (2 racks)



## #5 - High-Efficiency Commercial Dishwashers

*...for U.S.-Canada*

- ✓ Total potential **annual** potable water savings - estimated -  
**21 billion gallons or 80 bil. litres**

## TOP PRODUCT #4 Waterless Wok

The “typical” kitchen!



## #4 - Waterless Wok

- ✓ Originally conceived & developed in Australia - Sydney Water & others
- ✓ U.S. development: Wok Water Saver
  - Double-burner wok table
  - Burner efficiency same as conventional
  - Water recirculation loop to external chiller
    - ✓ Removes excess heat from wok table
    - ✓ Only 2.3% additional energy
  - Savings = ~120 gallons per hour





## #4 - Waterless Wok

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*...for U.S.-Canada*

- ✓ Total potential **annual** potable water savings -

**37 billion gallons or  
140 billion litres**

- ✓ BUT, a “difficult sell”



## #3 Hot water demand system (after-market)

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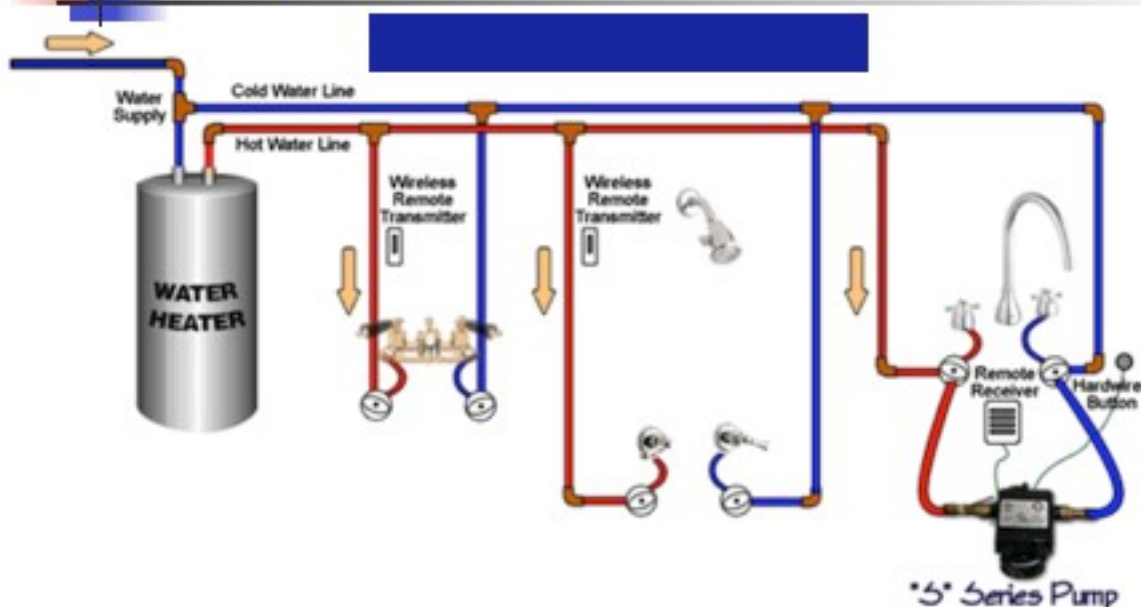
- Not “new”....available for years
- Used to reduce “wait time” for hot water
  - Primary user benefit
  - Water use reduction a secondary benefit
- Not a “tankless water heater” nor “point-of-use water heater”

## #3 Hot water demand system (after-market)

- Uses dedicated 'return line' OR existing cold water supply line
- Timer, temperature-controlled, or "on-demand"
- Barrier to installation: requires electrical outlet under lav sink furthest from water heater  
(cost of unit PLUS cost of electrician)
- User/homeowners install for convenience and just happen to save water

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## #3 Hot water demand system (after-market)



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## #3 Hot water demand system (after-market)

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*...for U.S.-Canada*

✓ Total potential **annual** potable water savings -

**250+ billion gallons or  
950+ billion litres**



## #2 - After-market dual-flush retrofit conversion device

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- Design Concept: Convert single-flush toilets to dual-flush toilets
- BUT - Many mfrs (>12) with products of questionable performance & safety
- Result: 2009 - Koeller and Veritec issued serious CAUTION STATEMENT!!!
  - Retrofit devices...
    - May increase full flush volume
    - May negatively affect toilet performance
    - May reduce trap seal



## #2 - After-market dual-flush retrofit conversion device

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PROBLEM: No accepted performance “standard” for such after-market devices

- Koeller and Veritec offer manufacturers participation in 3<sup>rd</sup>-party testing to address issues (manufacturers pay for testing)
- Manufacturers informed that all test results would be published – good or poor
  - ✓ Maximum flush volumes
  - ✓ Independently adjustable full and reduced flush volumes
  - ✓ Ease of installation (need to remove tank?)
  - ✓ Ease of adjustment
  - ✓ Quality of kit, expected water savings

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## #2 - After-market dual-flush retrofit conversion device

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- Manufacturer response to 3<sup>rd</sup>-party testing-
  - Many initially show initial interest
  - Only 2 submit products for testing
  - Only 1 (so far) meets minimum requirements
- Large potential savings –
  - Remaining devices at risk (water use, perf., safety)
  - **CAUTION STATEMENT** remains!

All such products must be 3<sup>rd</sup>-party tested to a recognized protocol!!!

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## #2 - After-market dual-flush retrofit conversion device



## #2 - After-market dual-flush retrofit conversion device





## #2 - After-market dual-flush retrofit conversion device

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*...for U.S.-Canada*

- ✓ Total potential **annual** potable water savings -

**300+ billion gallons or  
1+ trillion litres**



## TOP PRODUCT #1

### 0.8gal/3.0L Residential Toilet

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- ✓ Canadian development...2009
  - “Proficiency” in Canada *and*
  - “Stealth” in U.S.
- ✓ Field testing
  - Successfully completed in Ontario
  - Underway in Southern California
- ✓ Drainline transport addressed in 2005
- ✓ Single flush - NO “behavioral” element!!



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## TOP PRODUCT #1

0.8gal/3.0L Residential Toilet

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*...for U.S.-Canada*

✓ Total potential **annual** potable water savings -

**1 trillion gallons or  
4 trillion litres**



## Wrapping up...

	Total Potential Annual Water Savings		Capturable Annual Water Savings			Relative Degree of Difficulty & Cost to Implement	Behavioral Change Required?
	(billions of gals)	(Billions of litres)	% Likely Capture*	(billions of gals)	(Billions of litres)		
#1 - 3L Toilets for Residential	1,038	3,929	20%	208	786	Low	None
#2 - Dual-Flush Conversion Device	309	1,168	20%	62	234	Low	Slight
#3 - Hot Water Demand System	258	976	10%	26	98	Medium	Slight
#4 - Waterless Woks	37	141	10%	4	14	High	Maybe
#5 - High-Efficiency Comm'l Dishwashers	21	81	5%	1	4	High	None

\*-without financial incentives

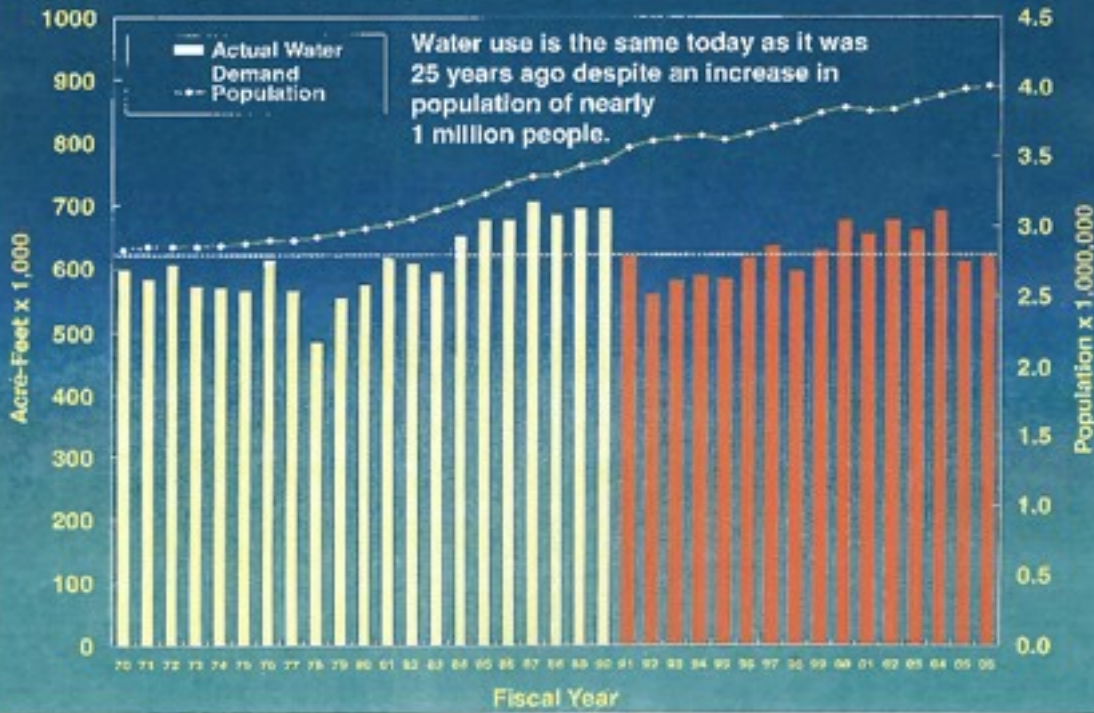


## And finally...

- ✓ Can these products (and others) reduce North American potable water consumption, accommodate growth, and defer major infrastructure capital expenditures?

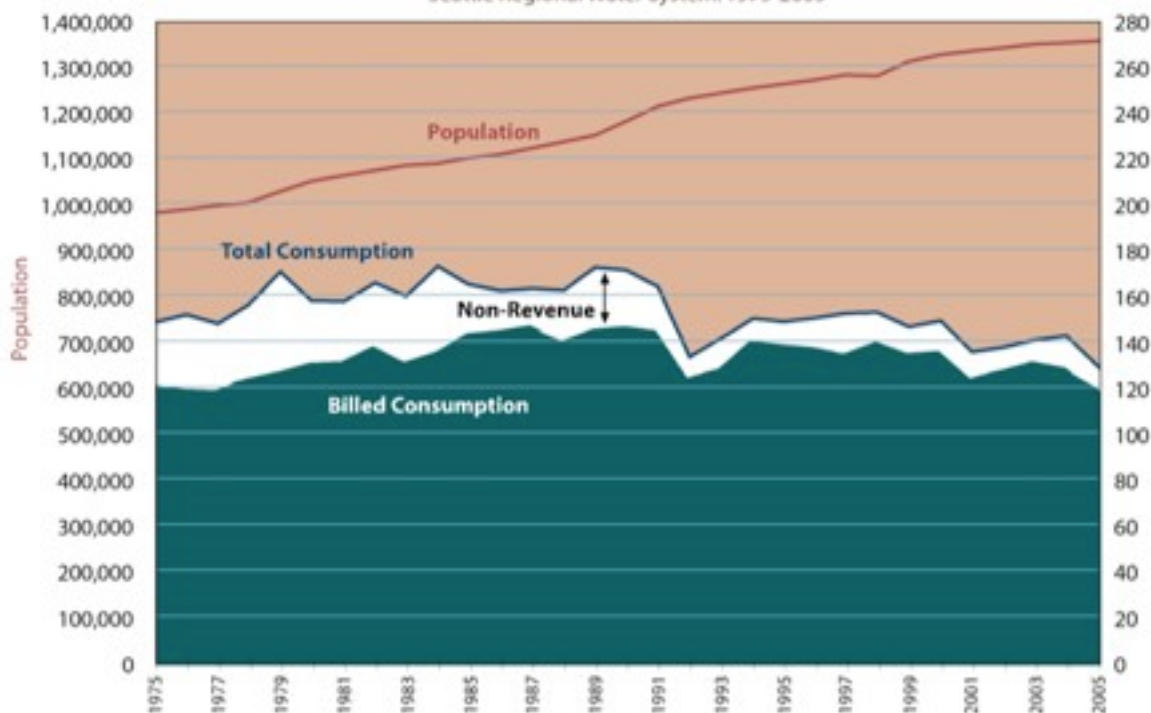
**Absolutely!!!**

# CONSERVATION'S IMPACT ON CITY OF LOS ANGELES WATER USE

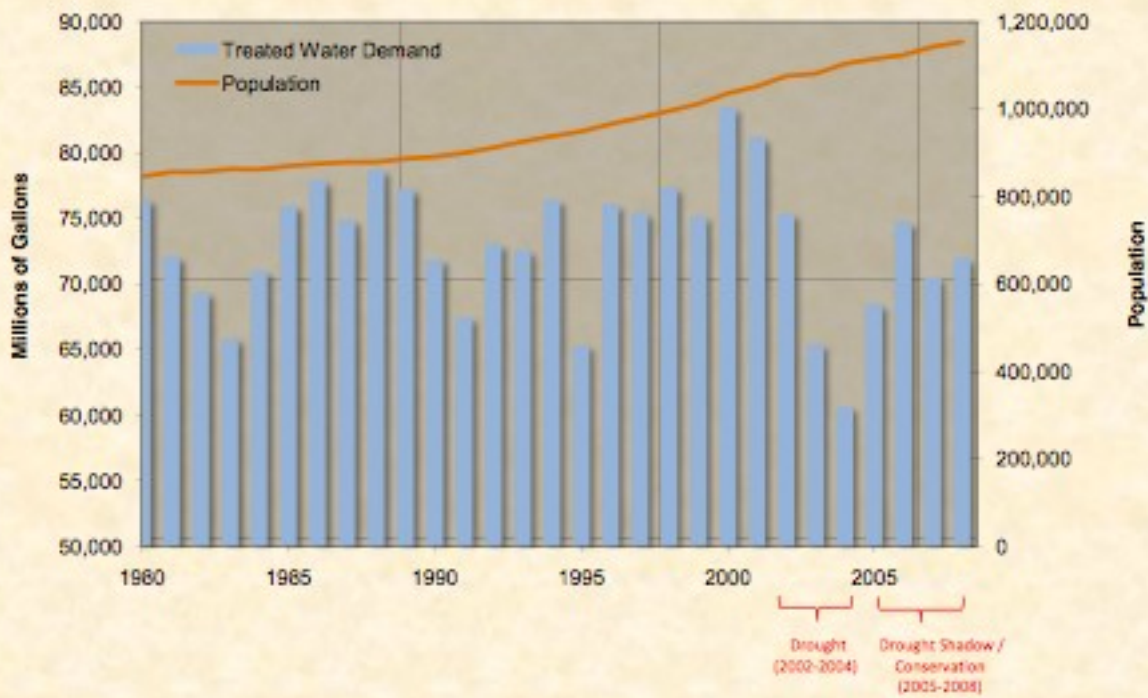


## Growth in Population and Water Consumption

Seattle Regional Water System: 1975-2005



## DENVER'S TREATED WATER DEMAND AND POPULATION



**Thank you...**

*Contact...*

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