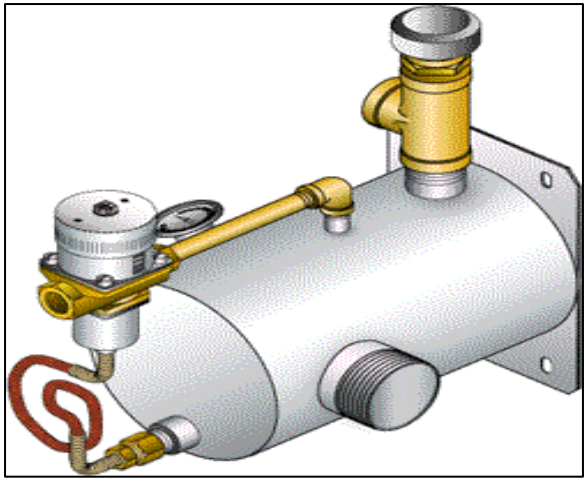
# Test new technology



# Testing brings innovation

- Ensures accuracy in flow rates and specifications
- Validates manufacturer claims
- Ensures proper performance of products
- Encourages healthy competition as results are posted
- Results in major innovations
  1. *High efficiency toilets*
  2. *Pre-rinse spray valves*

# Push for uniform standards

**1992 Energy Policy Act**

| ***Fixture*** | ***U.S. Standard*** |
|---|---|
| *Water Closets (Toilets)* | *1.6 gallons /flush* |
| *Showerheads* | *2.5 gallons /min* |
| *Faucets* | *2.2 gallons /min* |
| *Urinals* | *1 gallon /flush* |

- January 2001 Report sent to Congress
- 5-8% reduction of demand
- Delays and defers capital investment
- $26/person savings for $7.5 billion

# And keep improving those standards

- In 2005 US Energy Policy Act revised to set efficiency Standard for pre-rinse spray valves (1.6 gallons/minute maximum)
- In 2007 California enacted requirement that all toilets sold and installed be no more than 1.28 gallons/flush by 2014
- New national standard likely to mirror California law – perhaps in 2009?

# Again and again

In 2007 Energy Policy Act further revised:

- Standard dishwashers limited to 6.5 gallons per cycle after 1/1/2010; compact dishwashers limited to 4.5 gallons per cycle.
- Residential clothes washers must meet a maximum water factor of 9.5 by 1/1/2011. (Most are top loaders between 11.5 - 13.)
- Department of Energy authorized to specify even stronger efficiency standards for clothes washers in 2015 and dishwashers in 2018.

# Label tested products

- Program announced June, 2006
- Voluntary program only
- Energy Star companion
- 20% more efficient
- Early labeling for toilets
  - High efficiency
  - MaP Tested

# Schedule for WaterSense labeling

| | *2007* | *2008 and beyond* |
|---|---|---|
| *Irrigation* | *Certification for Irrigation Professionals* | *Smart Controllers*<br>*Moisture Sensors*<br>*Drip Micro Technology*<br>*Failure Abatement Technology* |
| *Residential Plumbing* | *Toilets*<br>*Faucets* | *Showerheads* |
| *Commercial Plumbing* | | *Toilets*<br>*Faucets*<br>*Faucet Sensor Technology*<br>*Urinals* |
| *Other* | | *New Homes*<br>*Autoclaves*<br>*Medical Vacuums*<br>*Image Processors*<br>*Additional Professional Certifications* |

# So…..what's our solution?

1. Strive for higher product efficiencies
2. **Connect water and energy**
3. Build green
4. Price water appropriately
5. Educate and motivate the consumer
6. Develop alternate sources
7. Partner for positive change

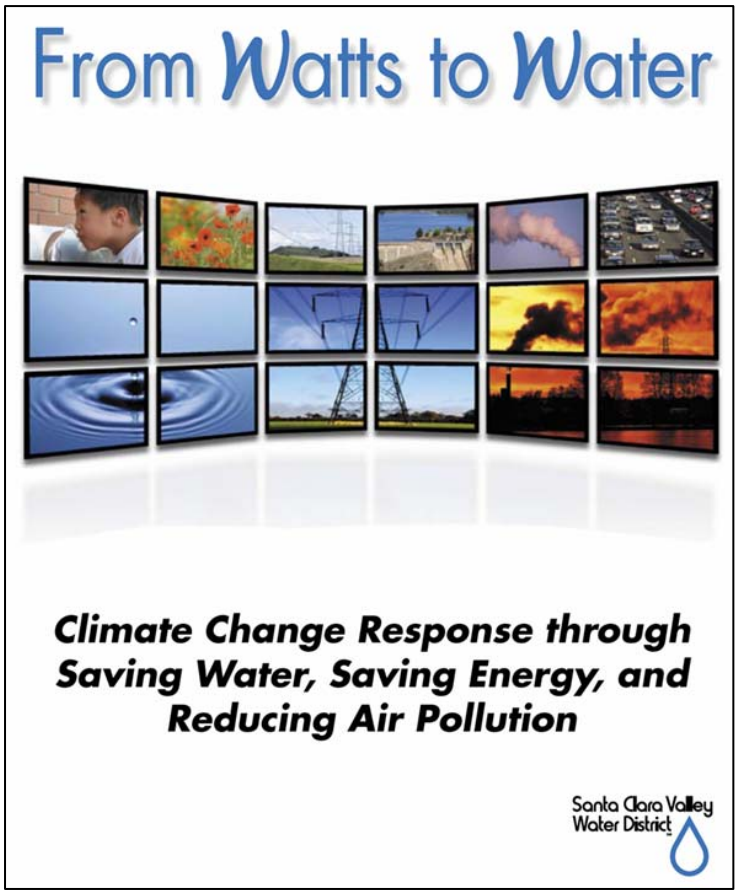
# The basic principle

**Saving water ⇨ saves energy ⇨ saves greenhouse gas emissions**

# Pacific Institute model


- "Water to Air" Model
- Urban and Agriculture versions
- www.pacinst.org
- Tested in California at the Santa Clara Valley Water District and others
- US and Canada regional testing underway

# Santa Clara Valley Water District



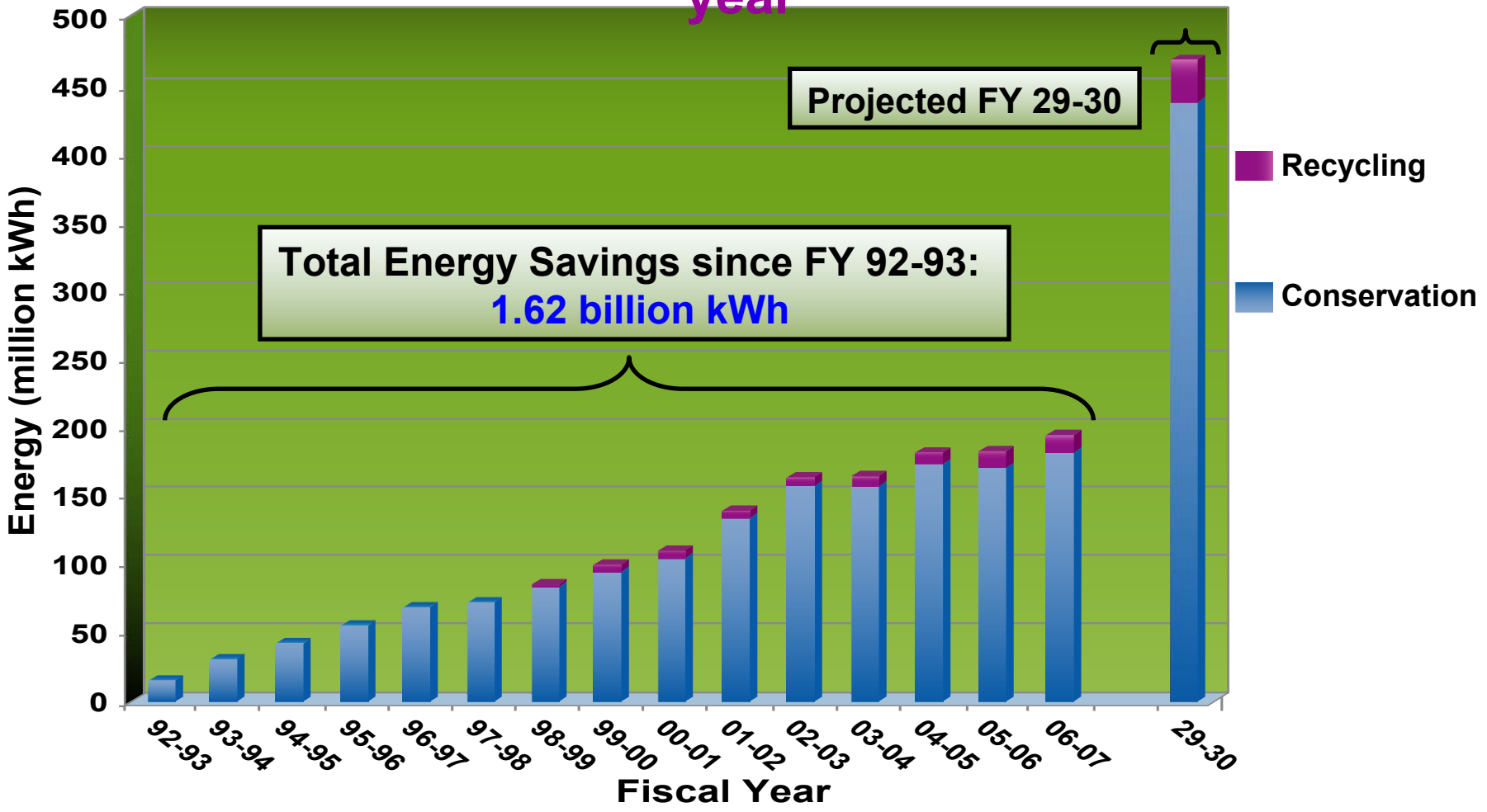

- Tested Pacific Institute Model
- Analyzed system operations
- Analyzed water conservation programs
- Calculated kWh saved
- Calculated CO2 emissions saved

# Example:  clothes washer

- 9,240 kWh per washer over 12-year life span
- 2,180 kg of Carbon Dioxide per washer over 12-year life span

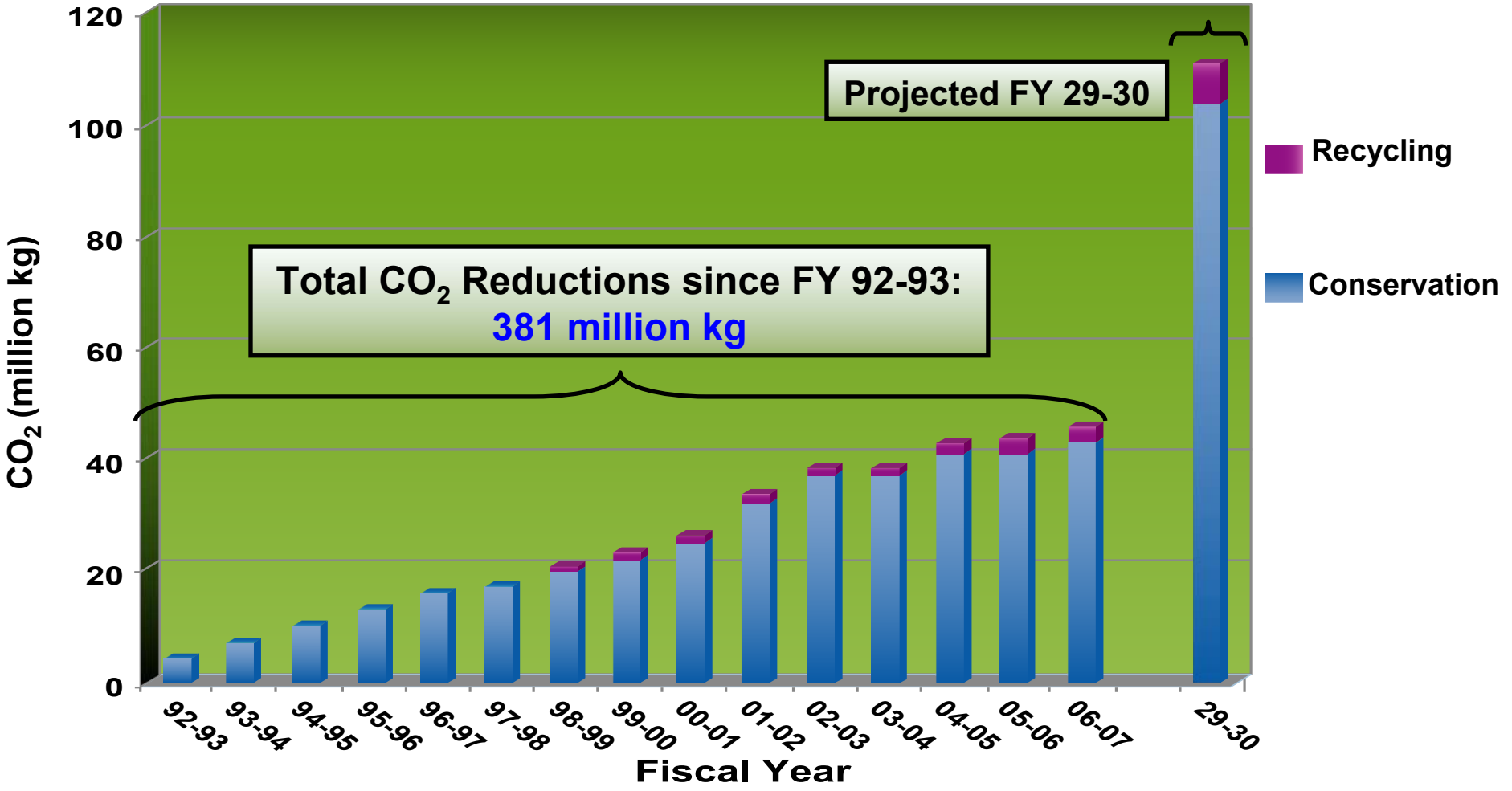
# Cumulative energy savings example

**Equivalent to electricity for 236,000 households for one year**



# Cumulative $CO_2$ reductions example

**Equivalent to removing 82,000 passenger cars for one year**



# Joint savings opportunities

- Residential Clothes Washers
- Commercial Clothes Washers
- Ultra Low Flow Toilets
- Landscape Conservation
- Residential Audits and Retrofits for Energy and Water
- Commercial Dishwashers
- Pre-rinse spray valves

# So…..what's our solution?

1. Strive for higher product efficiencies
2. Connect water and energy
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# Is green building the answer?

- Only if it addresses water properly
- US Green Building Council LEED programs  very weak on water
- **30%** or more savings are possible if efficient products are used
- An estimated **1 billion gallons** per day could be saved by 2015 with more efficiency in new buildings

# So…..what's our solution?

1. Strive for higher product efficiencies
2. Connect water and energy
3. Build green
4. **Price water appropriately**
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# We are still not pricing properly

| Rate Structure | Residential | Non-Residential |
|---|---|---|
| Uniform | 37.2% | 45.9% |
| Increasing block | 29.1% | 17.6% |
| Decreasing block | 30.4% | 33.1% |
| Other | 3.4% | 3.4% |

*Adapted from Raftelis, 2002*

# Water budget-based rates?

- AWWARF Study just being released
- Implemented in communities facing limited supplies/shortages
- Seen as more equitable way to share limited supply while preserving choice
- “Fairness” cited as its greatest advantage
- Need to communicate assumptions to customer and allow for necessary adjustment

# Where already implemented

| | Utility | Location |
|---|---|---|
| 1 | IRWD | Irvine, CA |
| 2 | Otay Water District | San Diego, CA |
| 3 | Capistrano Valley WD | San Juan Capistrano, CA |
| 4 | City of Boulder | Boulder, CO |
| 5 | LADWP | Los Angeles |
| 6 | Town of Cary | Cary, NC |
| 7 | City of Morrisville | Morrisville, NC |
| 8 | SDCWA | San Diego, CA |
| 9 | Marco Island | Marco Island, FL |
| 10 | San Clemente | San Clemente, CA |
| 11 | Monterey District Tarrif Area | Monterey, CA |
| 12 | City of Castle Rock | Castle Rock, CO |
| 13 | Las Vegas Valley Water District | LVVWD |
| 14 | Centennial Water & Sanitation District | Highlands Ranch, CO |
| 15 | Santa Rosa | Santa Rosa, CA |
| 16 | Eastern MWD | Los Angeles metro area |
| 17 | Lake Arrowhead | S. California |
| 18 | City of Aurora | Aurora, CO |
| 19 | Southern Nevada Water Authority | Las Vegas, NV |
| 20 | Contra Costa Water District | Contra Costa, CA |
| 21 | City of Rohnert Park | Rohnert Park, CA |
| 22 | City of Santa Barbara | Santa Barbara, CA |
| 23 | City of Fairfield | Fairfield, CA |
| 24 | City of Albuquerque | Albuquerque, CA |
| 25 | EBMUD | Oakland, CA |
| 26 | Salt Lake City Dept. of Public Utilities | Salt Lake City, UT |

# Have savings been documented?

| Period | Otay | Irvine | Capistrano Valley |
|---|---|---|---|
| pre ‘88-’90 Average | 28.71 | 52.16 | 28.35 |
| post ’90 Average | 23.05 | 32.78 | 18.45 |
| Difference | -5.66 | -19.38 | -9.90 |
| Percent Change | -20% | -37% | -35% |

*Values are irrigation rates in inches/acre*