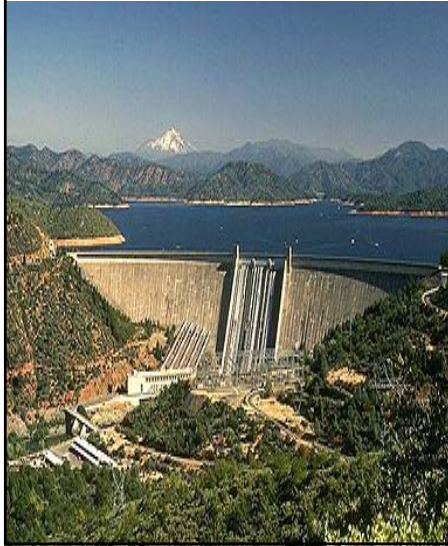


A Preliminary Statewide Assessment of Water-Related



Energy Use and Some Implications for Energy Efficiency Programs

Gary Wolff, P.E., Ph.D.

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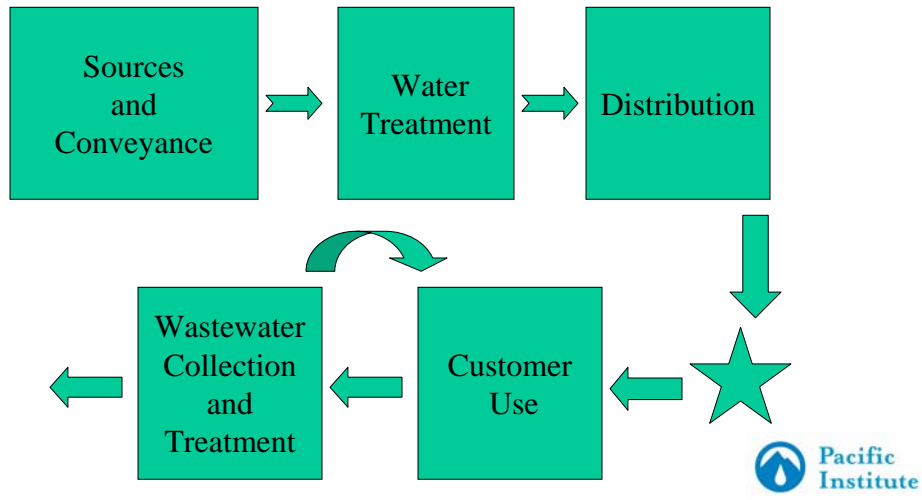
Research for People and the Planet

Four Topics Today

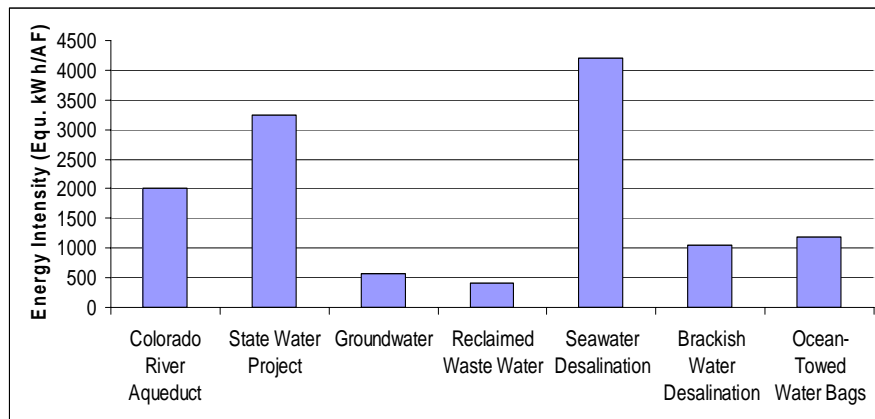
1. An Energy ‘in’ Water Case Study
2. The Economics of Energy ‘in’ Water
3. Two Preliminary Statewide Assessments of Water-Related Energy
4. Some Implications for Energy Efficiency Programs



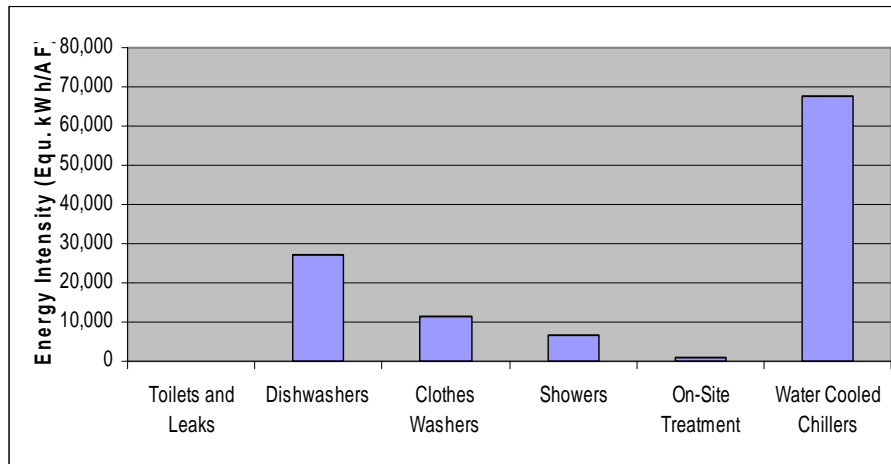
Methodology for the Case Study ... (See “Energy Down the Drain”)



Sources and Conveyance Energy Intensity For San Diego County

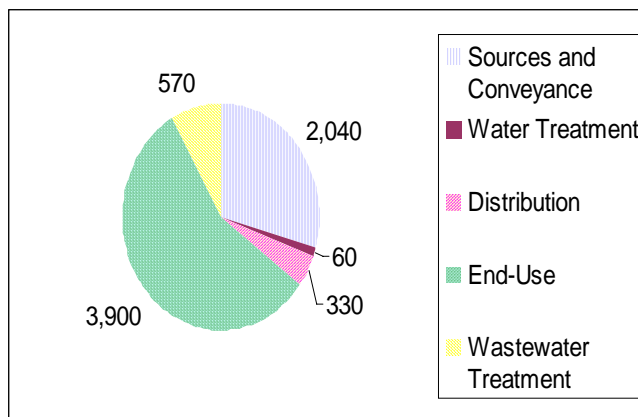


Estimated Energy Intensity of Customer Water Use



San Diego County Case Study

- Total Energy Intensity: 6,900 Equivalent kWh Per AF
- > 50% Is On The Customer Side of the Meter



Economics of Energy ‘in’ Water

- Accounting for Both Water and Energy Costs Strengthens the Case for Conservation of Both Water and Energy in Urban Settings
- Even if Water Is Free, Embedded Energy Savings Can Make Water Conservation Desirable



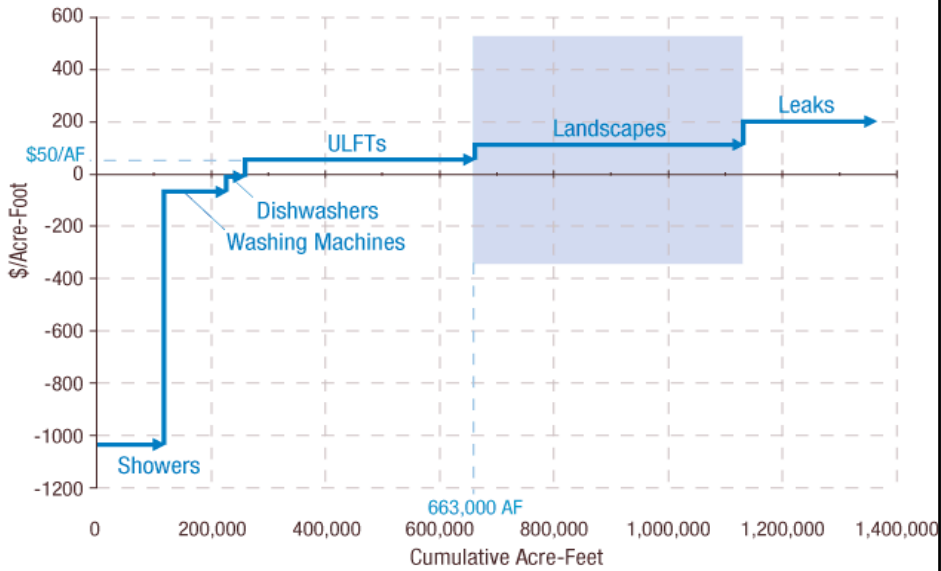
Example: Efficient Clothes Washer

Commodity Saved	Levelized Cost	Comparable Utility Price	Looks Desirable?
Water Only	\$3.61 / ccf conserved	\$1.75/ ccf purchased	No
Natural Gas Energy Only	\$1.07 / therm conserved	\$0.85/ therm purchased	No
Both	\$0.75 / ccf <u>or</u> \$0.55 / therm	\$1.75/ ccf <u>or</u> \$0.85/ therm	Yes

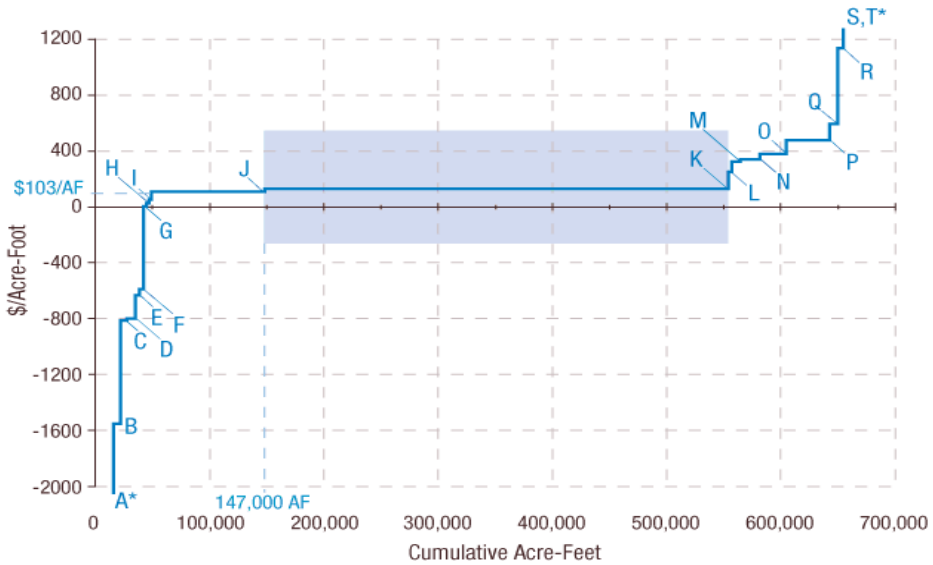
Assumes 12 Year Useful Life, \$150 Incremental Capital Cost;
6% Interest Rate; DOE Data for Energy & Water Savings



Residential Co-Benefits in CA



CII (Com/Inst/Ind) Co-Benefits in CA



Preliminary Statewide Assessments

- CA Energy Commission 2005 Integrated Energy Policy Report (http://www.energy.ca.gov/2005_energy_policy/index.html)
- A Work in Progress By the Pacific Institute and Bob Wilkinson (2006 Product)



CEC Staff Estimate:

	Electricity (GWh)	Natural Gas (Mill. Therms)
Water-Related	48,012	4,284
Consumption In 2001	250,494	13,571
Percent of Statewide Use	19%	32%



Compared With The PI Estimate (In Progress):

	Electricity (GWh)	Natural Gas (Mill. Therms)
CEC Staff	48,012	4,284
PI Preliminary	61,427	< 3,205
Percent Difference	+28%	-25%



What About Air Quality?



- We Developed “Water to Air” Models in 2004
- They’re Available At: www.pacinst.org
- Preliminary Estimate of Water-Use-Related Carbon Dioxide Emissions Statewide Is About 48 Million Metric Tons (10% of CA GHG Total)



Efficiency Program Implications

- Energy Utility or Air Regulator Investments in Water Conservation and Efficiency? E.g., Consider CPUC Approved Energy Efficiency Program Investments (CEC IEPR, p. 130):

	(2004-2005)	(2006-2008)	Water Use Efficiency
GWh / Yr. Conserved	2,745	6,812	6,500
\$ / kWh Conserved	\$0.28	\$0.22	\$0.13

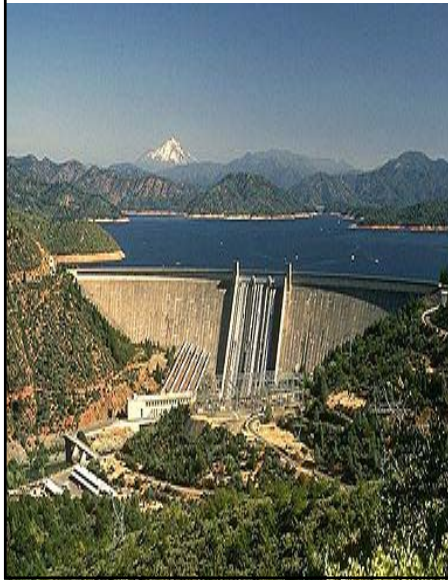


More Program Implications

- New Standards or Plumbing Codes:
 - Recall, 1992 Energy Policy Act Manufacturing Standards for Toilets and Showerheads
 - “Conditional” CA Standards for Clothes Washers: Water Factor of 8.5 in 2007 and 6.0 in 2010
- New Labels for Consumers (e.g., “Water Star”)
- Unified Billing Systems That Help Customers See These Connections & Reduce Their Total Bill; Even If One Part (e.g., Water) Goes Up



Conclusion



We Live in A Universe.
But Some Connections Matter
More Than Others.
Understanding Which Matter
More is the Challenge.

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