

This presentation premiered at WaterSmart Innovations

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The Dollar Side of Water Conservation in the CII Sector

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Water Management, Inc.



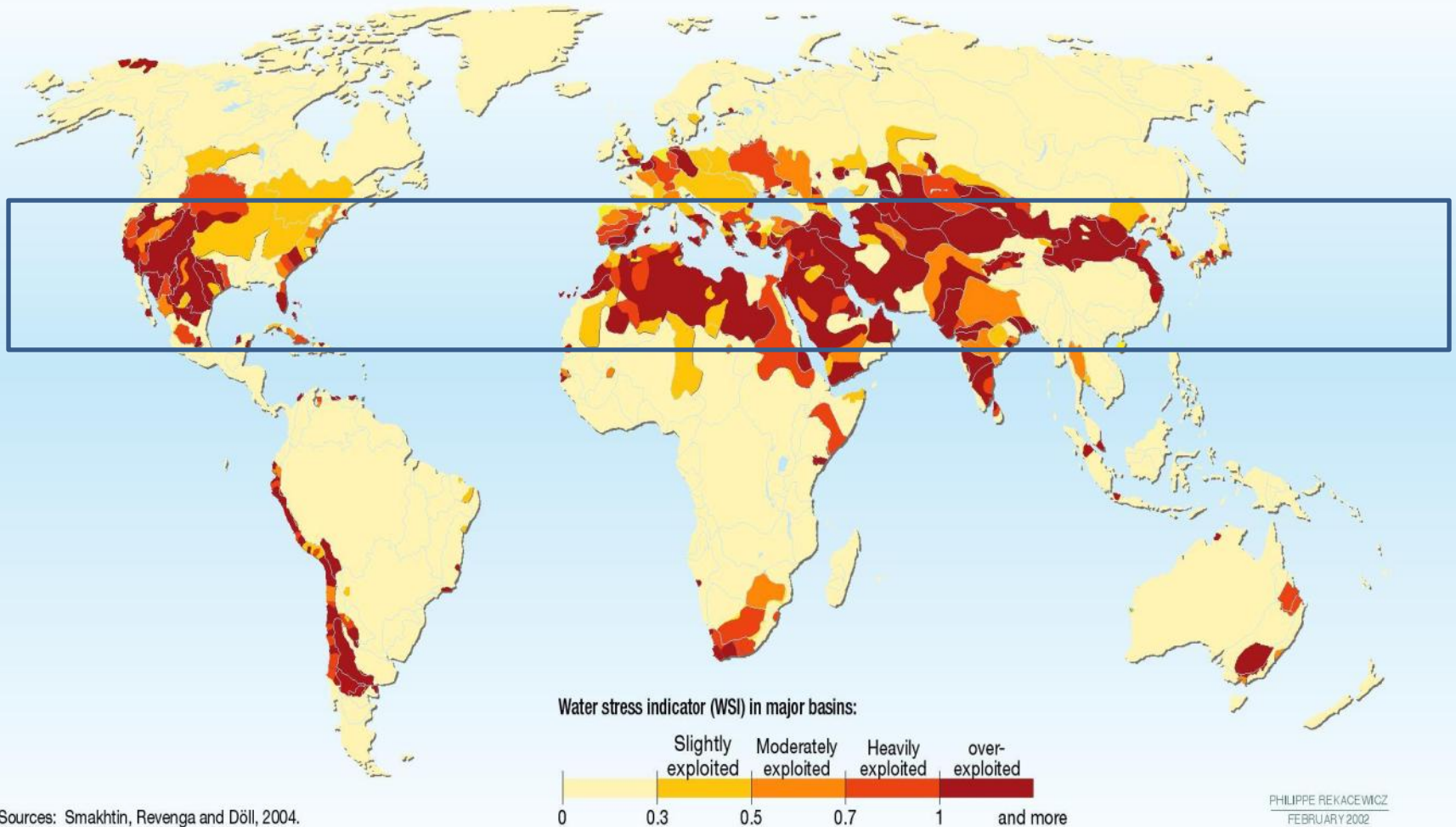
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What Will Be Covered

- **The cost of expanding capacity**
- **The true worth of using conservation to delay water and wastewater treatment capacity expansion;**
- **“Capacity Buy Back”**
- **The benefits to the customer ; and**
- **A look at some innovative ways to help fund conservation**

Water Stress Indicators

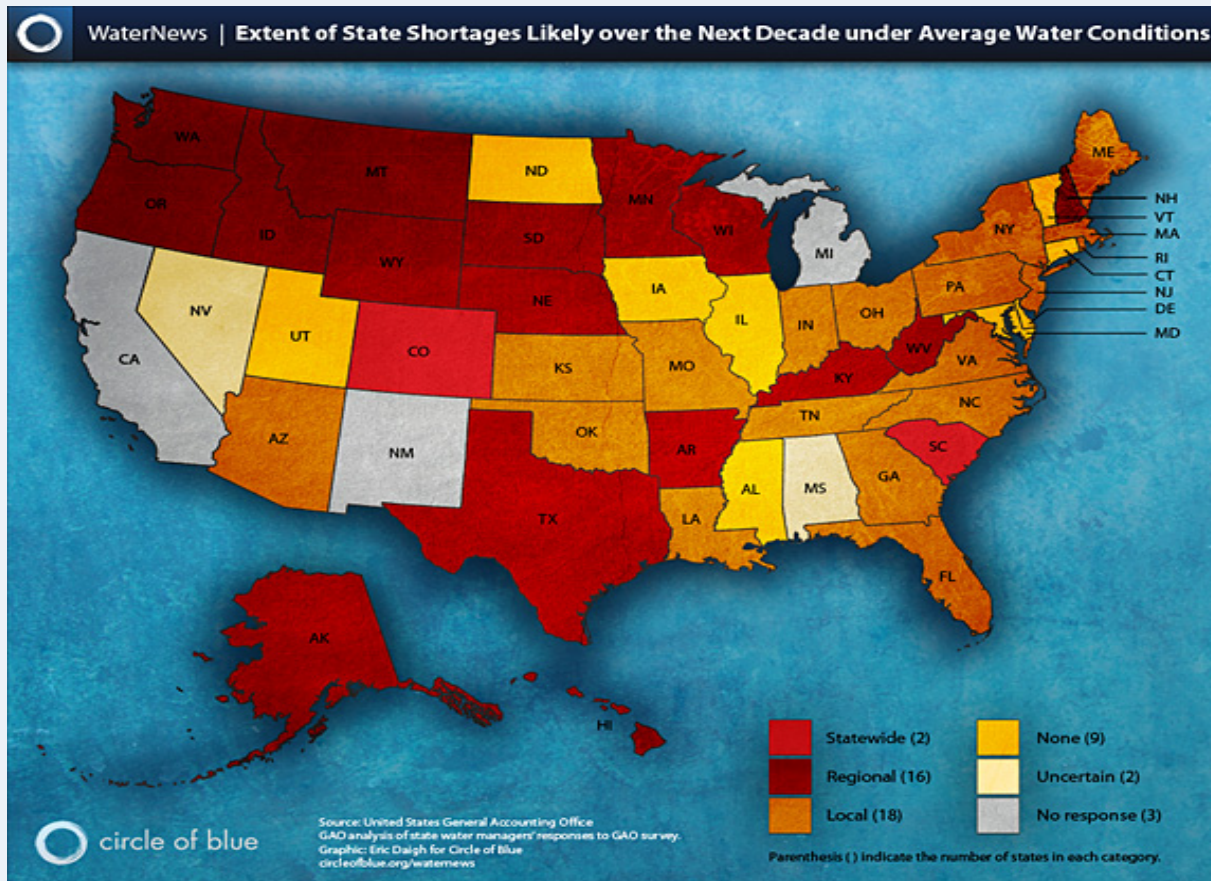
The latitude of stress



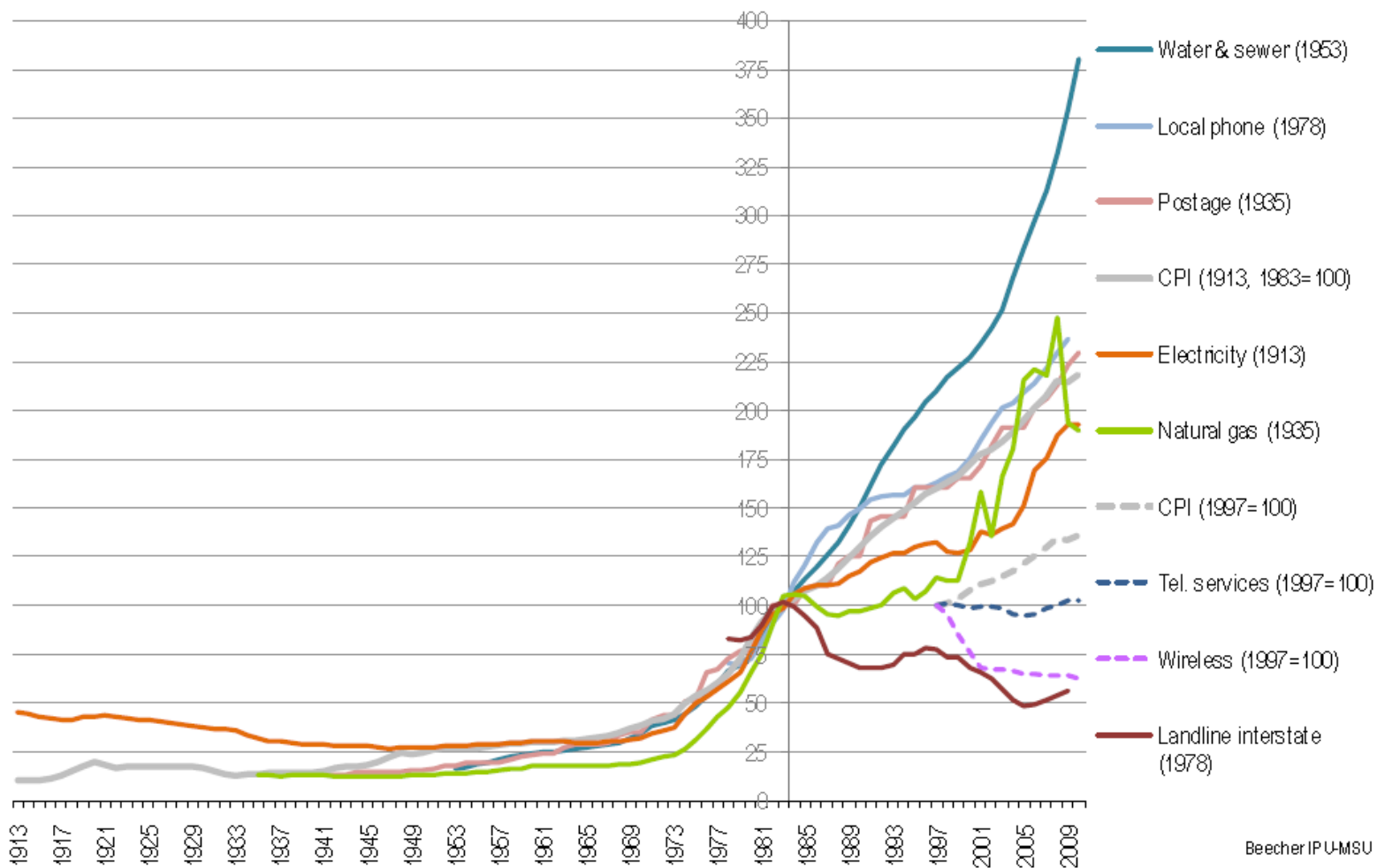
Sources: Smakhtin, Revenga and Döll, 2004.

PHILIPPE REKACEWICZ
FEBRUARY 2002

Government Accounting Office Survey Shows 36 States to Experience Water Shortages & *California and New Mexico Did not Respond!*



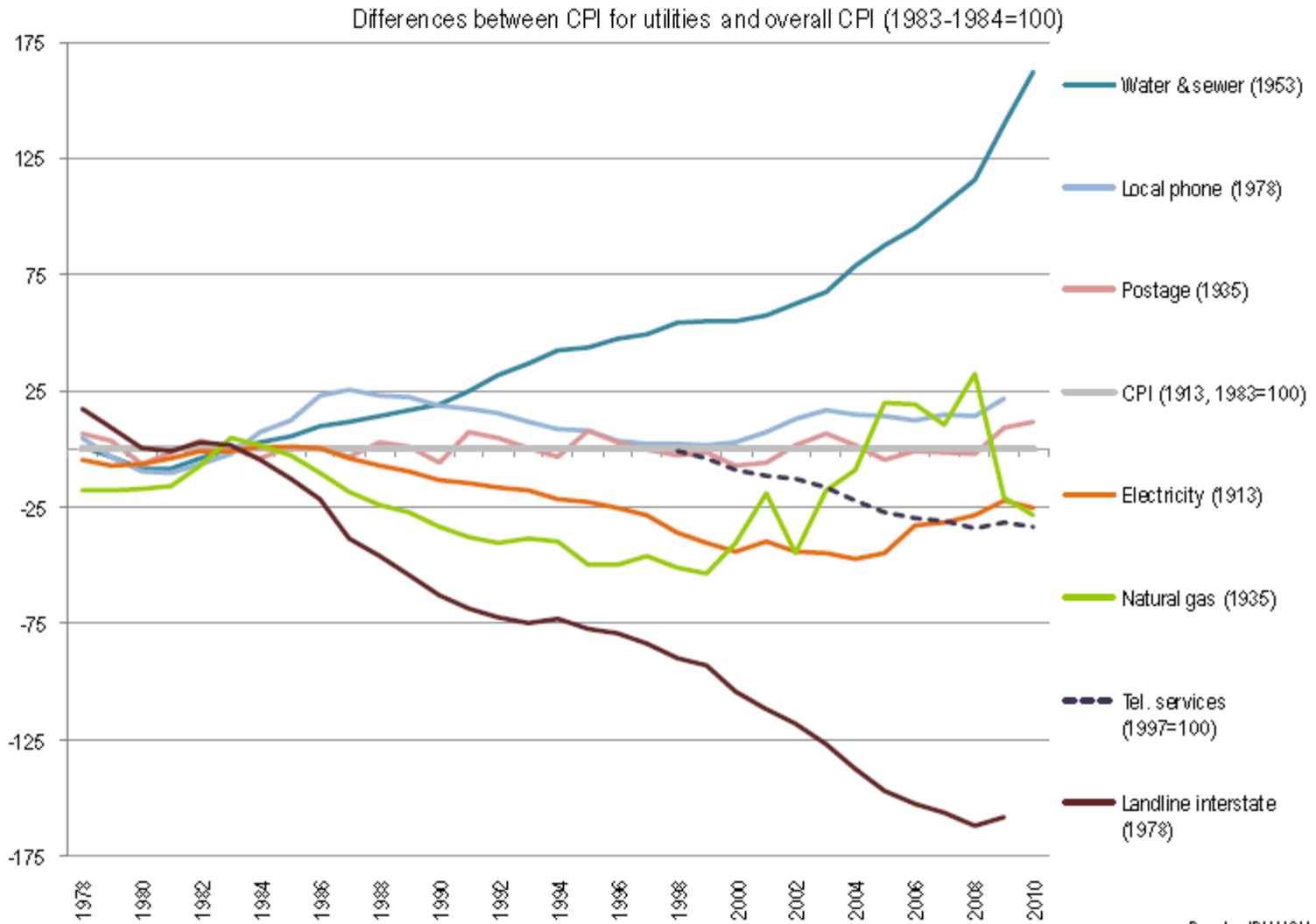
Long-term trends in consumer prices (CPI) for utilities (1983=100)



Beecher IPU-MSU

Exhibit 1. Long-term trends in the Consumer Price Index (CPI) for utilities (1913-2010).

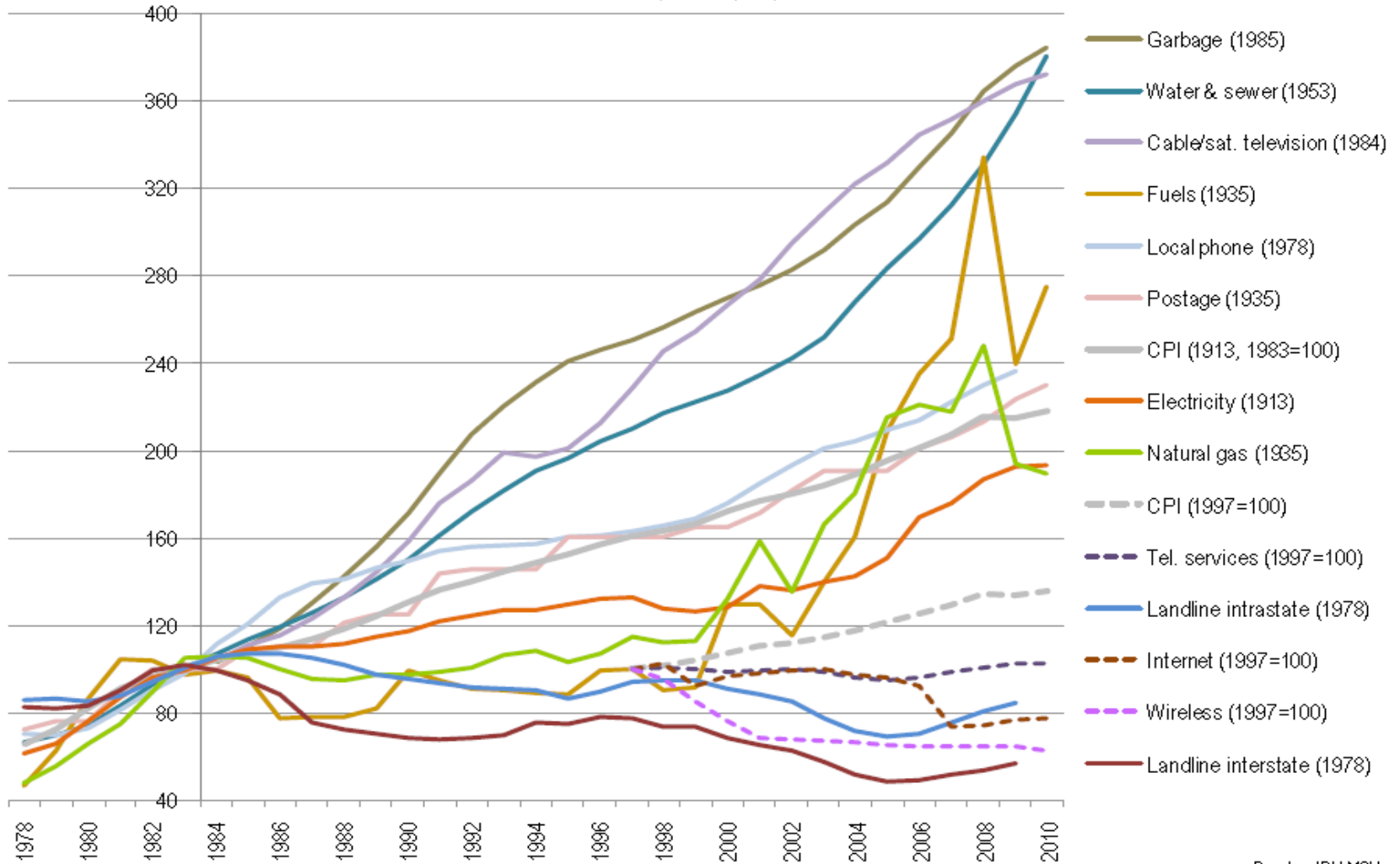
The index is set to 100 for 1982-1984 except for telephone and wireless services, where the index is set to 100 for 1997.



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Exhibit 3. Trends in the difference between the overall CPI and the CPI for utilities (1979-2010). The index is set to 100 for 1982-1984 except for internet and wireless services, where the index is set to 100 for 1997.

Trends in consumer prices (CPI) for utilities



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Exhibit 2. Trends in the Consumer Price Index (CPI) for utilities (1979-2010).

The index is set to 100 for 1982-1984 except for telephone, wireless, and internet services, where the index is set to 100 for 1997.

Large Industry are Taking Note

Shouldn't' You



- Over 20 water related initiatives world wide
- Major efforts to look at the future cost of water
- International efforts to become more water efficient

Global Water Initiatives

- Aquawareness
- Alliance for Water Stewardship
- BIER Water Footprint Working Group
- Carbon Disclosure Project -Water Disclosure
- Corporate Water Gauge
- Federation House Commitment to Water Efficiency
- Global Environmental Management Initiative (GEMI)
- Global Reporting Initiative
- Global Water Tool (WBCSD)
- UNEP/SETAC Life Cycle Initiative
- Strategic Water Management Framework (Australia minerals)
- UN CEO Water Mandate
- Water Brief for Business
- Water Footprint Network
- Water Footprint Neutrality and Efficiency Project (UN)
- Water Neutral Offset Calculator
- WaterSense Certification Scheme
- Water Stewardship Initiative
- ISO Water Footprint Standard

The Cheapest Water
You Will Ever Have
Is The Water You
Already Have!

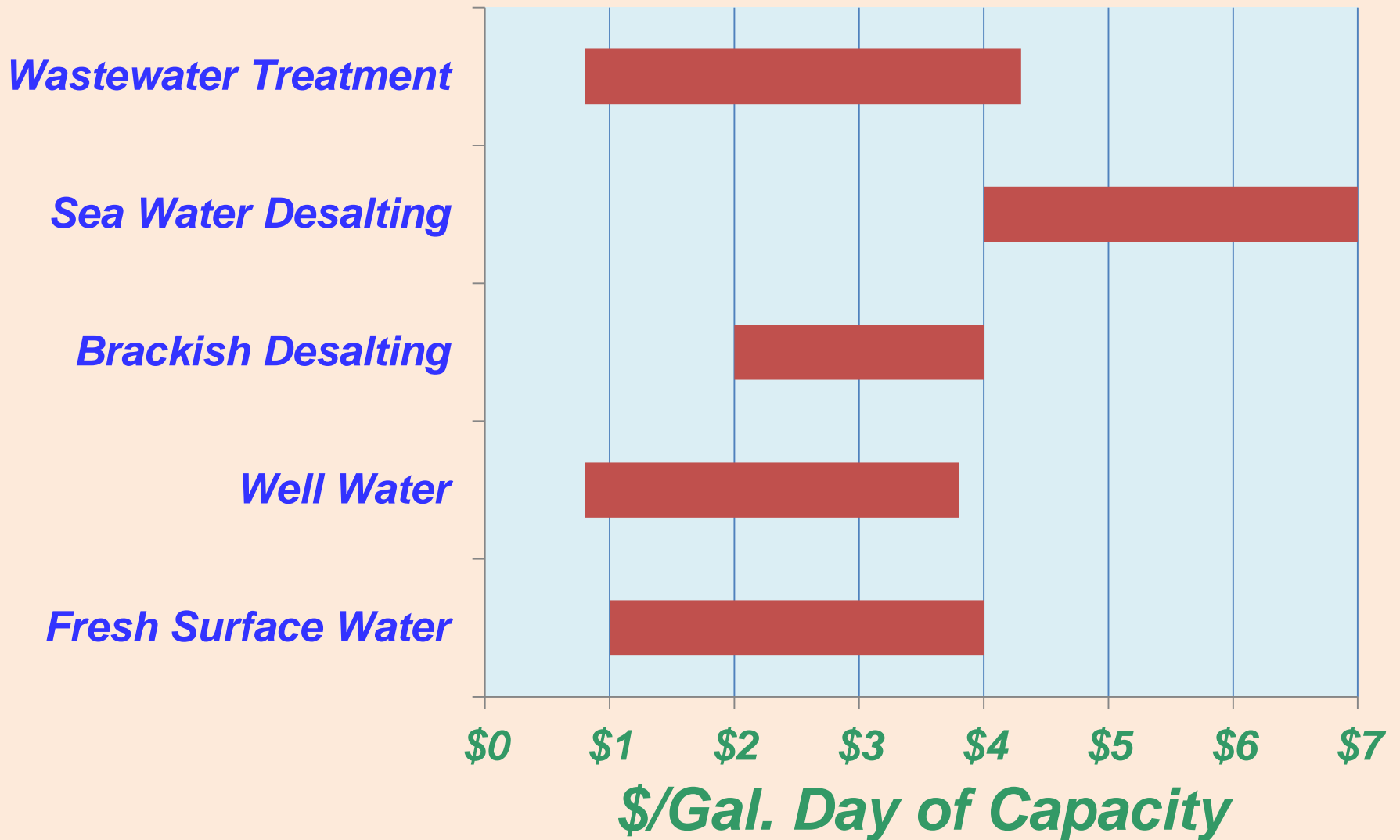
**But all this just makes rates go
up!**

Right.???

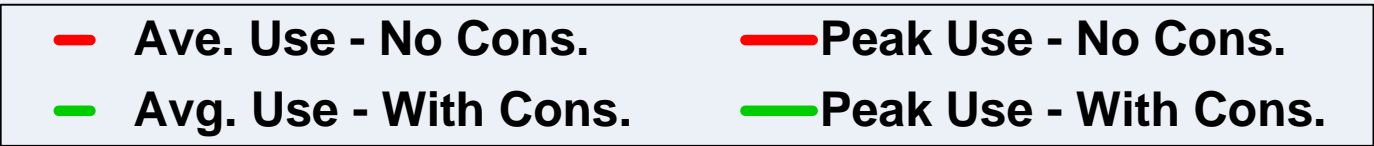
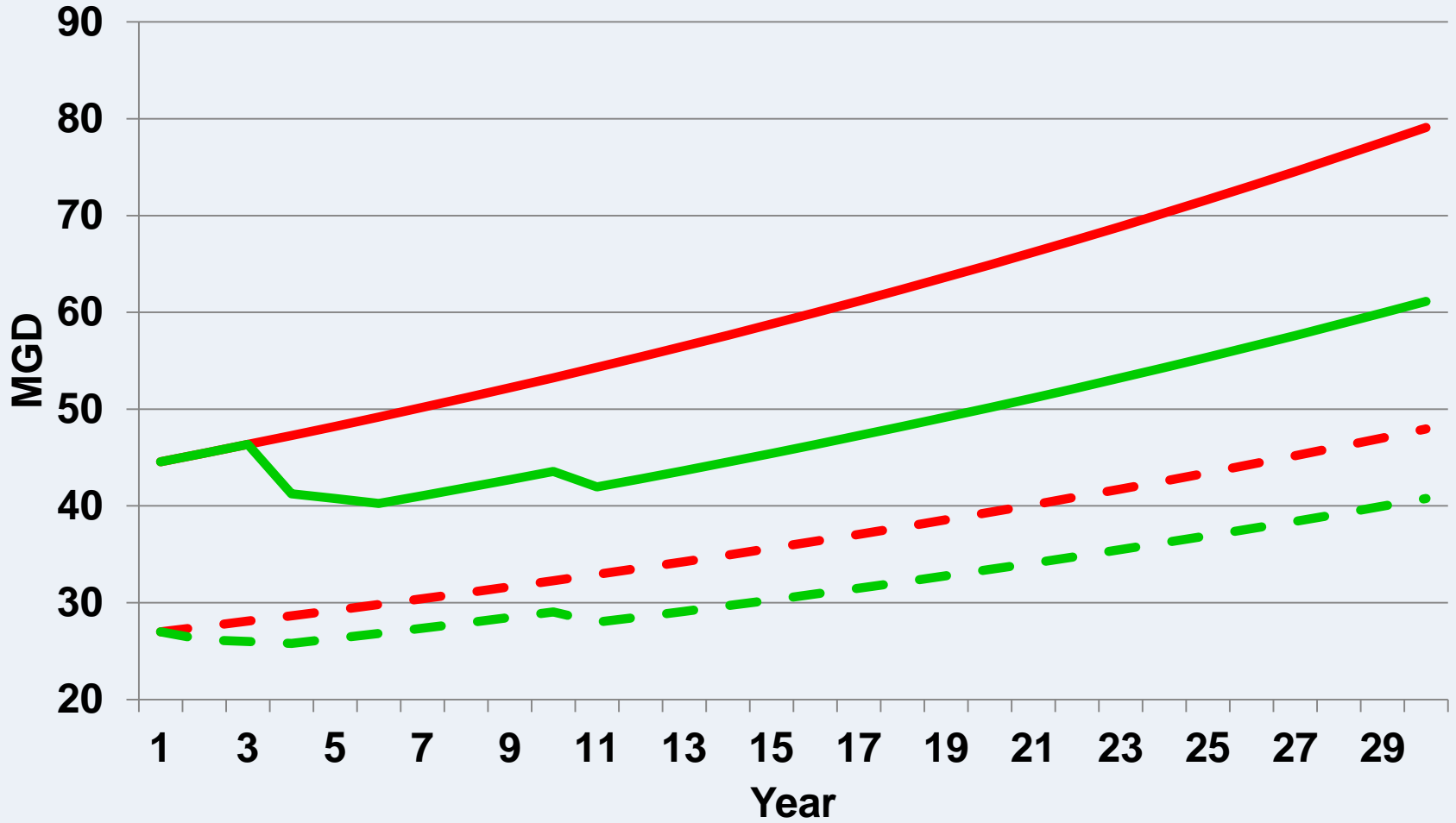
Example City

- **Current use 180 gpcd avg. & Peak = 1.65 avg.**
- **Population growth = 2% per year**
- **Implement program to reduce average account use by 10% first 10 years and by a total of 15% afterwards**
- **Reduce Peak to Average ratio from 1.65 to 1.50 by year 5**
- **Variable Cost 60 cents per kgal.**
- **Bond rates – 20 years at 4.5%**
- **Current rate = \$3.50/Kgal.**
- **Capital cost = \$1.75 per gal-day of capacity**

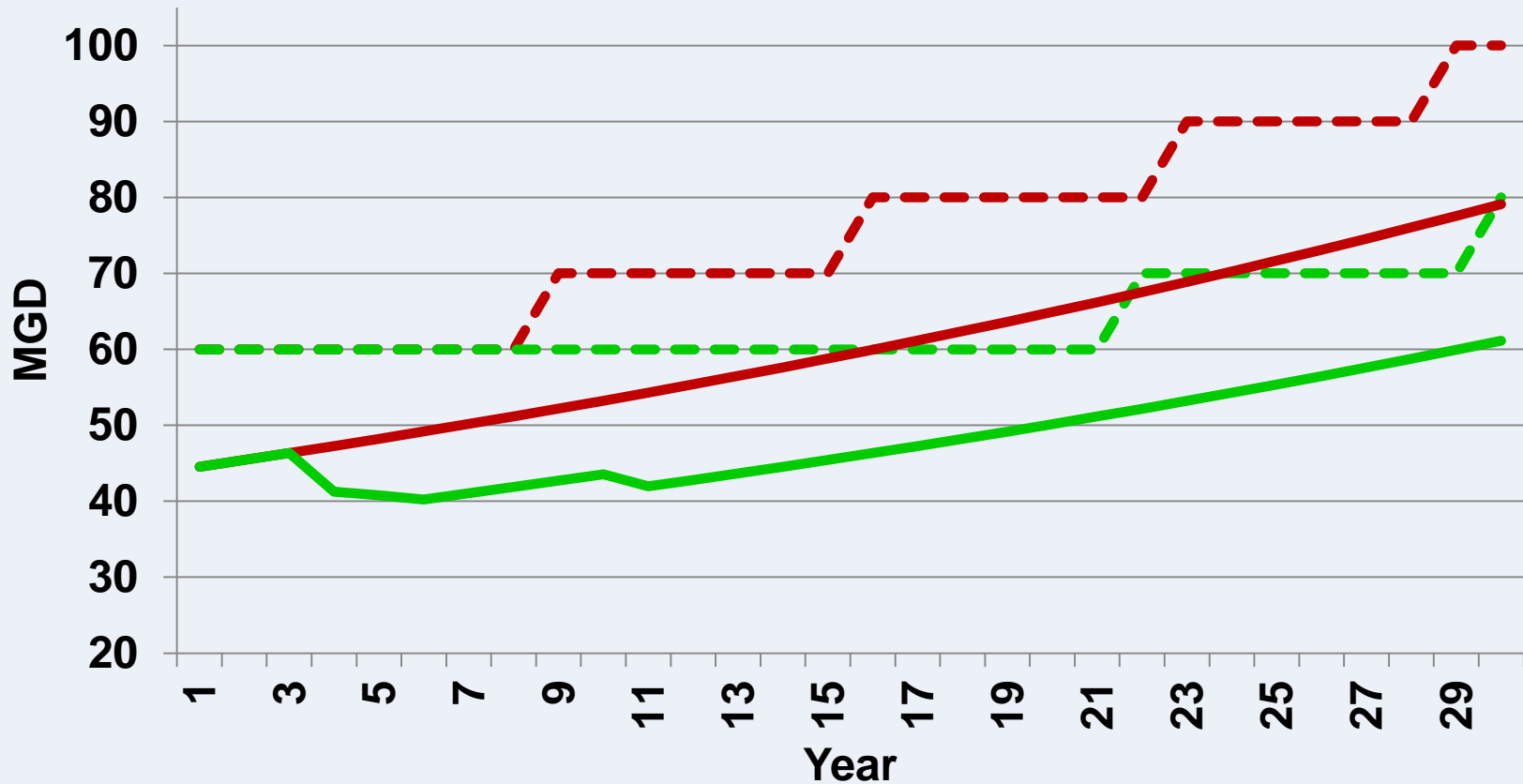
Capital Cost of New Capacity



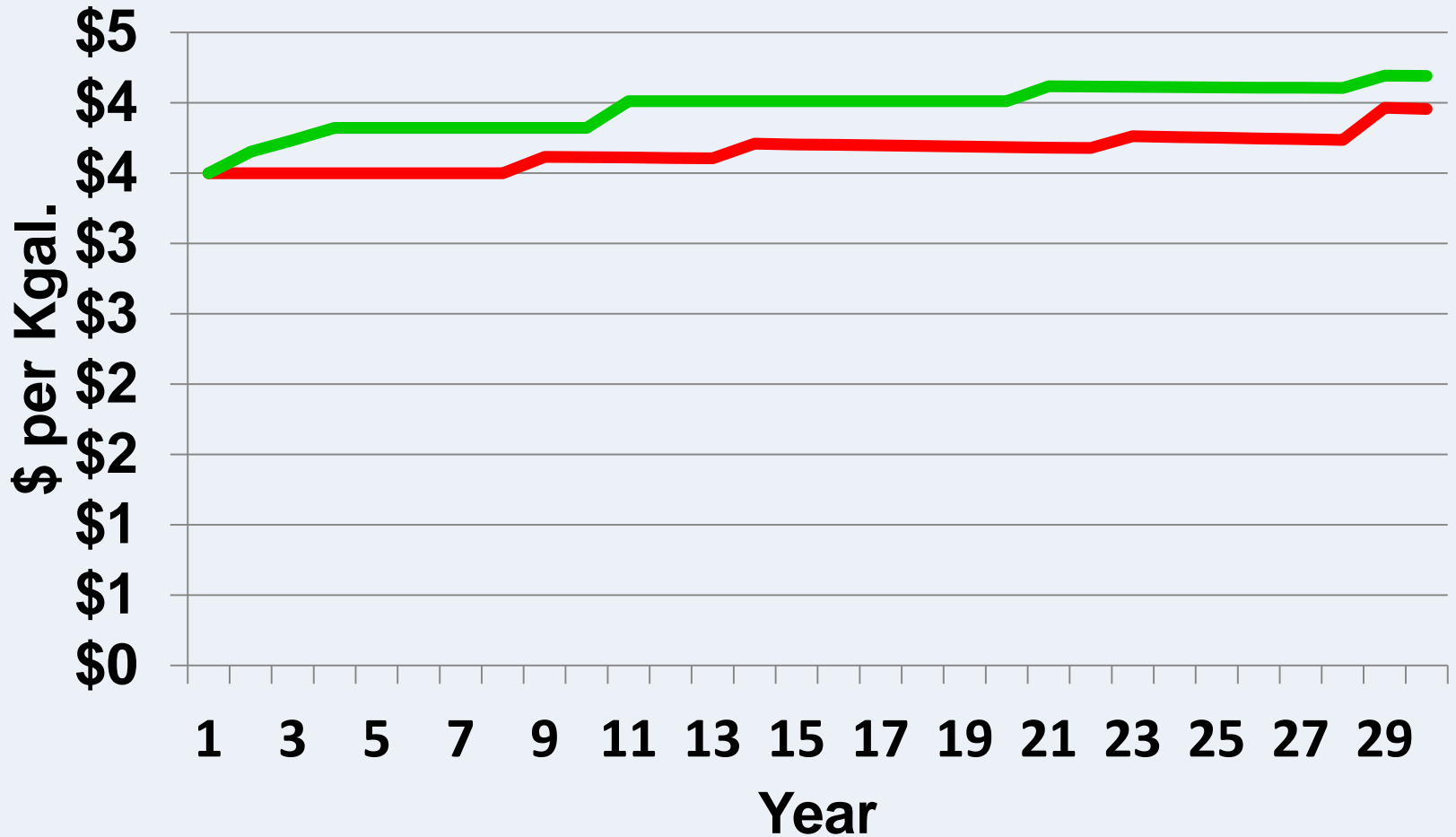
Water Use With & Without Conservation



Expansions at 85% of Peak Capacity

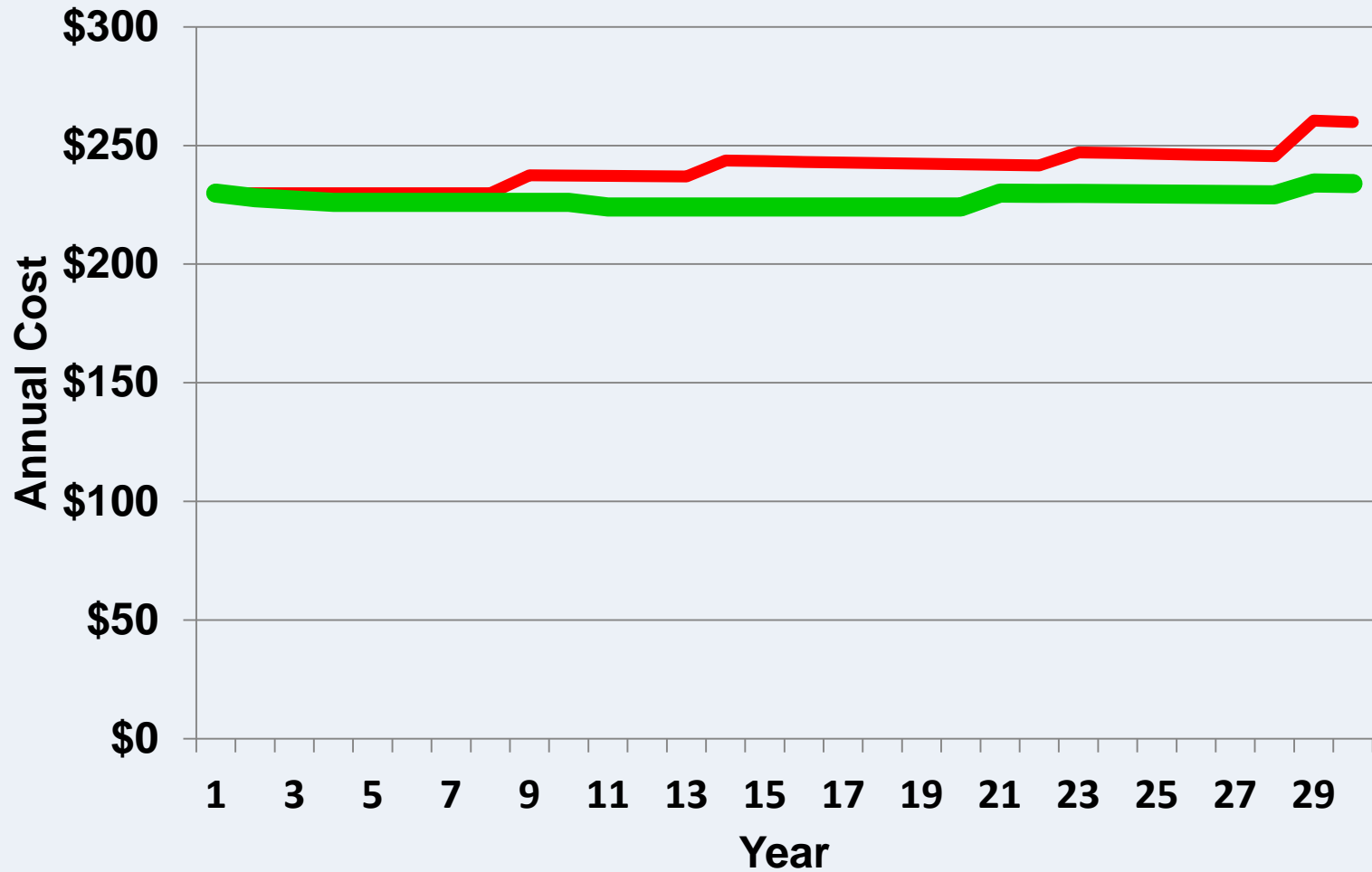


True Cost of Service Rate to Cover Costs



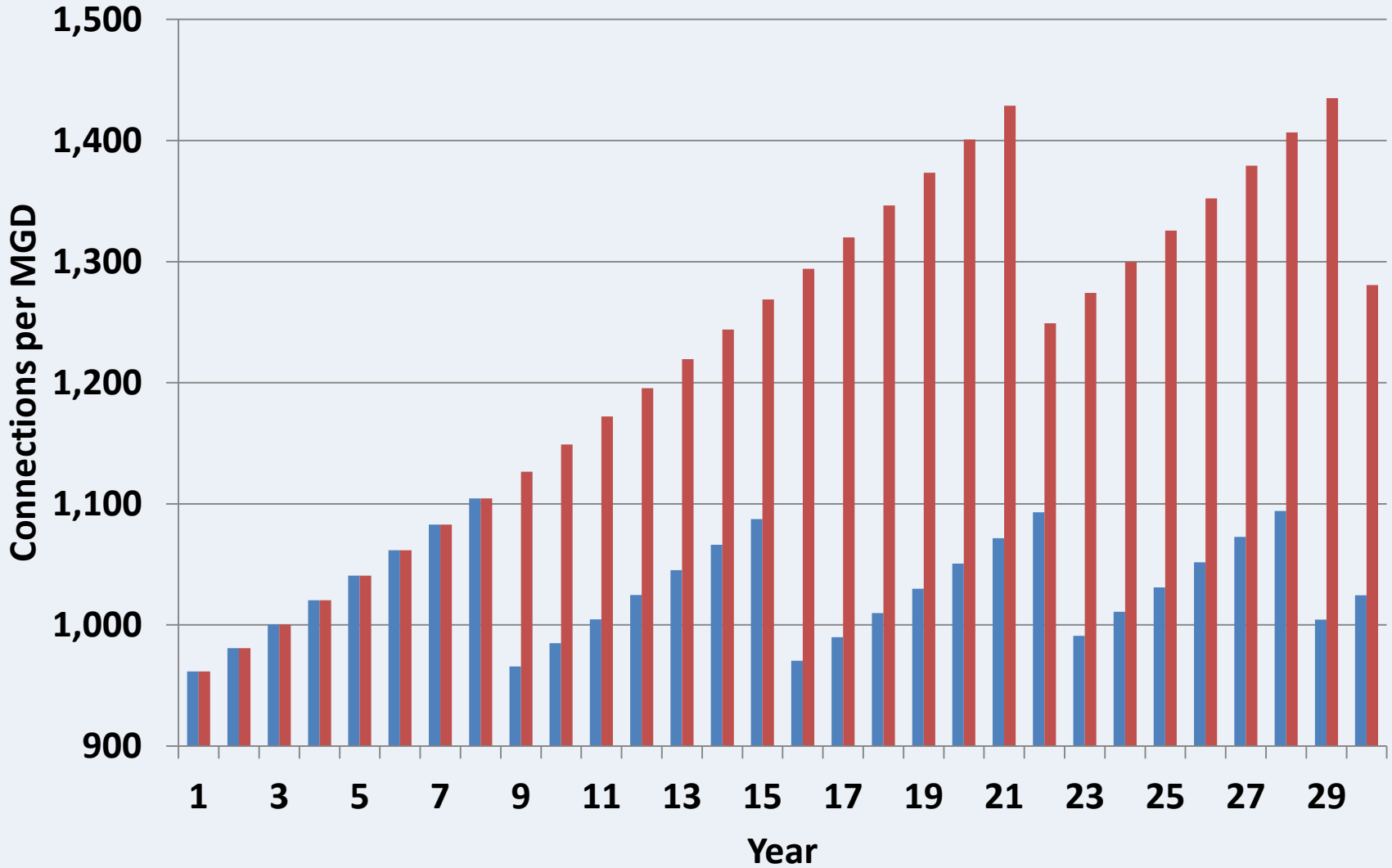
— Without Conservation — With Conservation

Annual Customer Cost



— Without Conservation — With Conservation

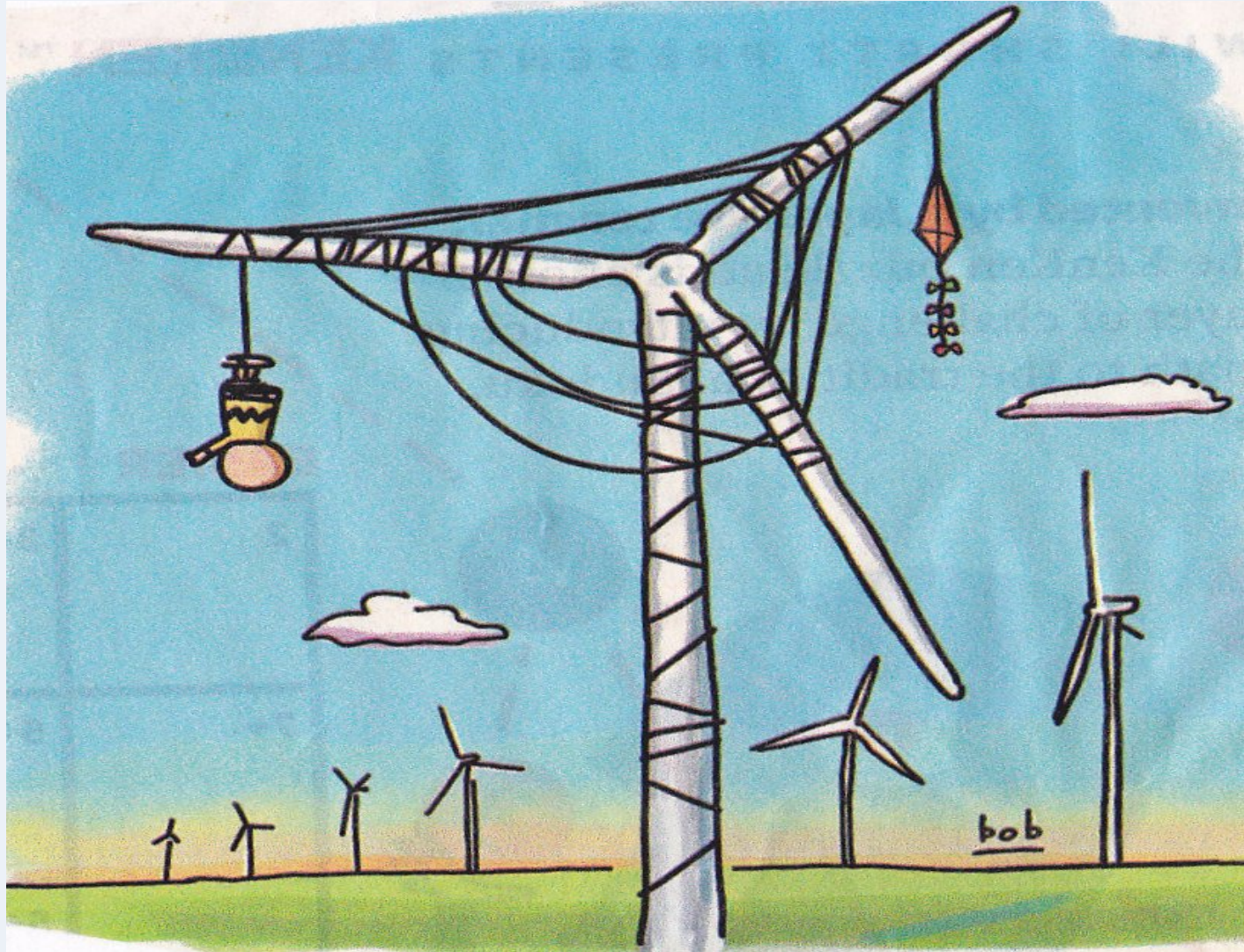
Connections per MGD of Capacity



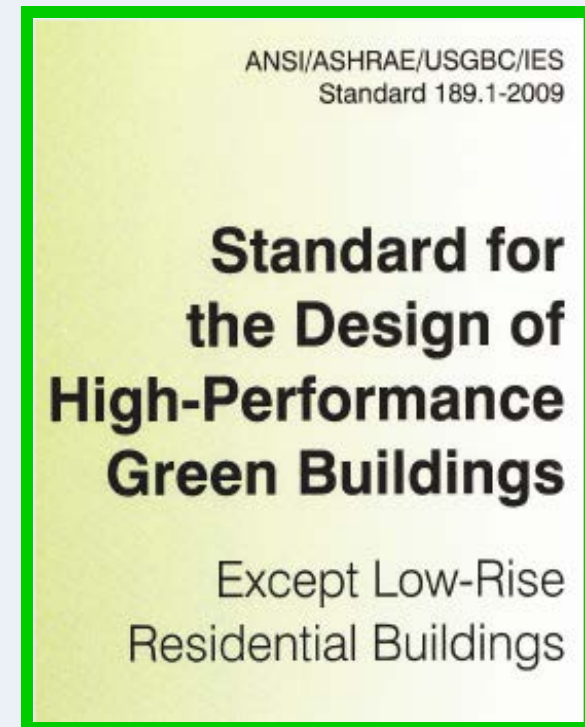
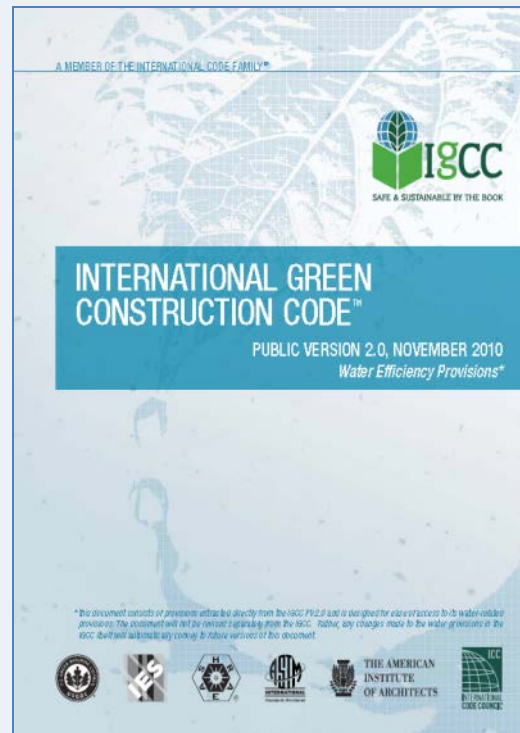
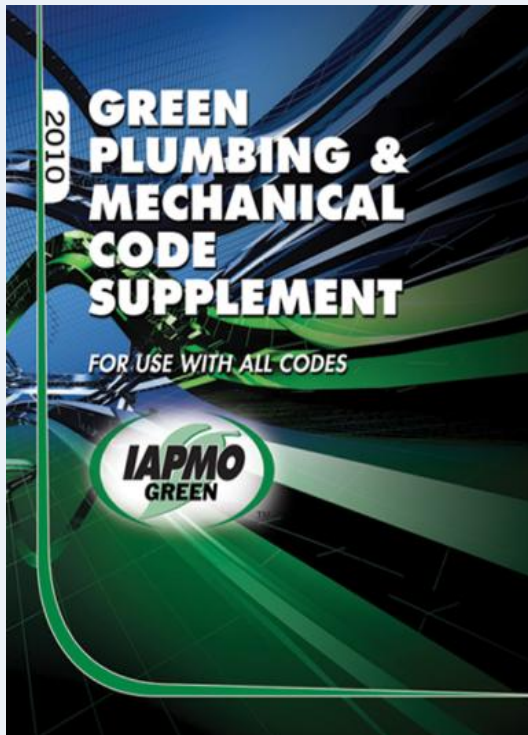
■ No Conservation ■ With Conservation

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Going Green is the “In Thing” According to Charlie Brown



Codes & Standards

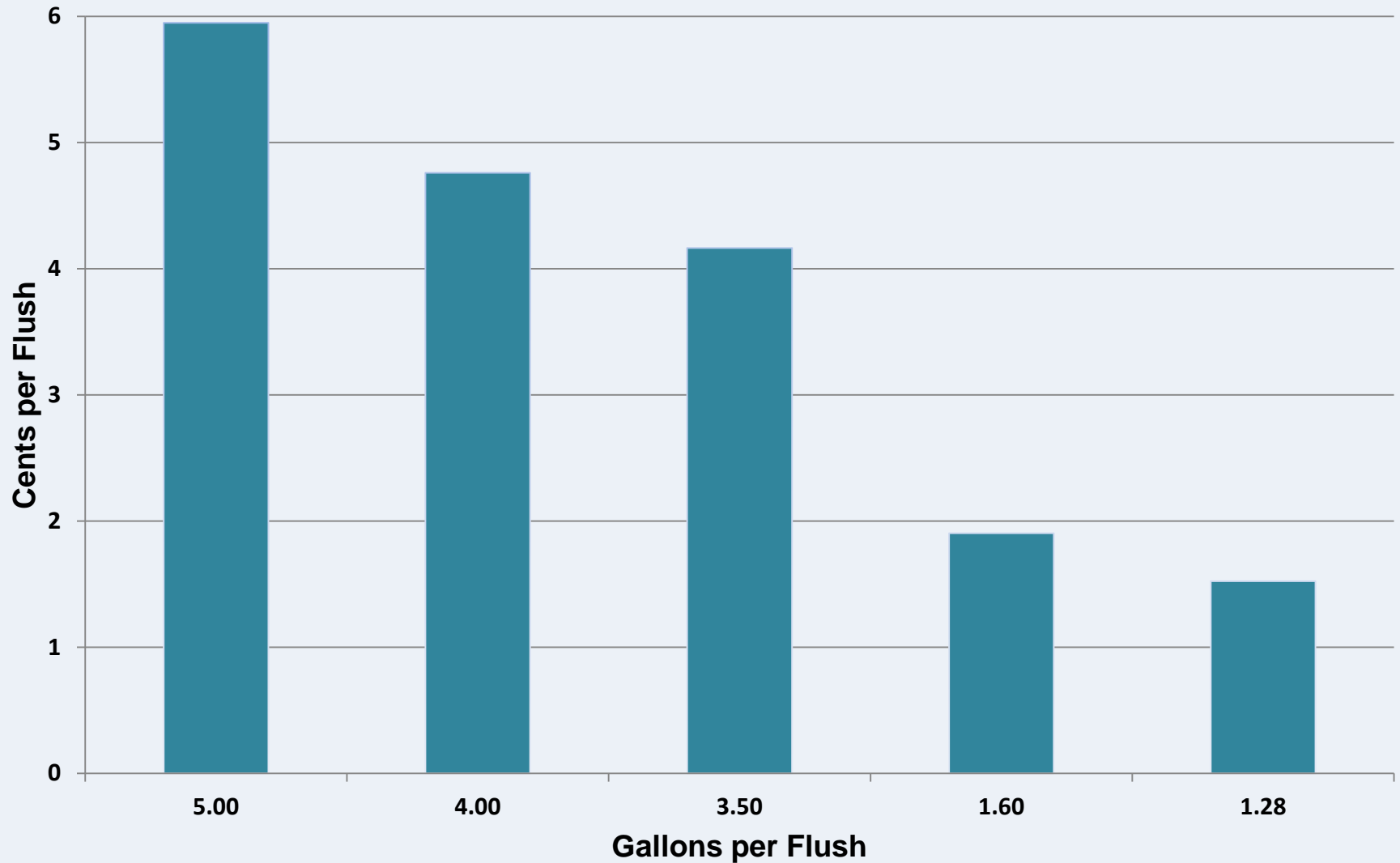


And again -

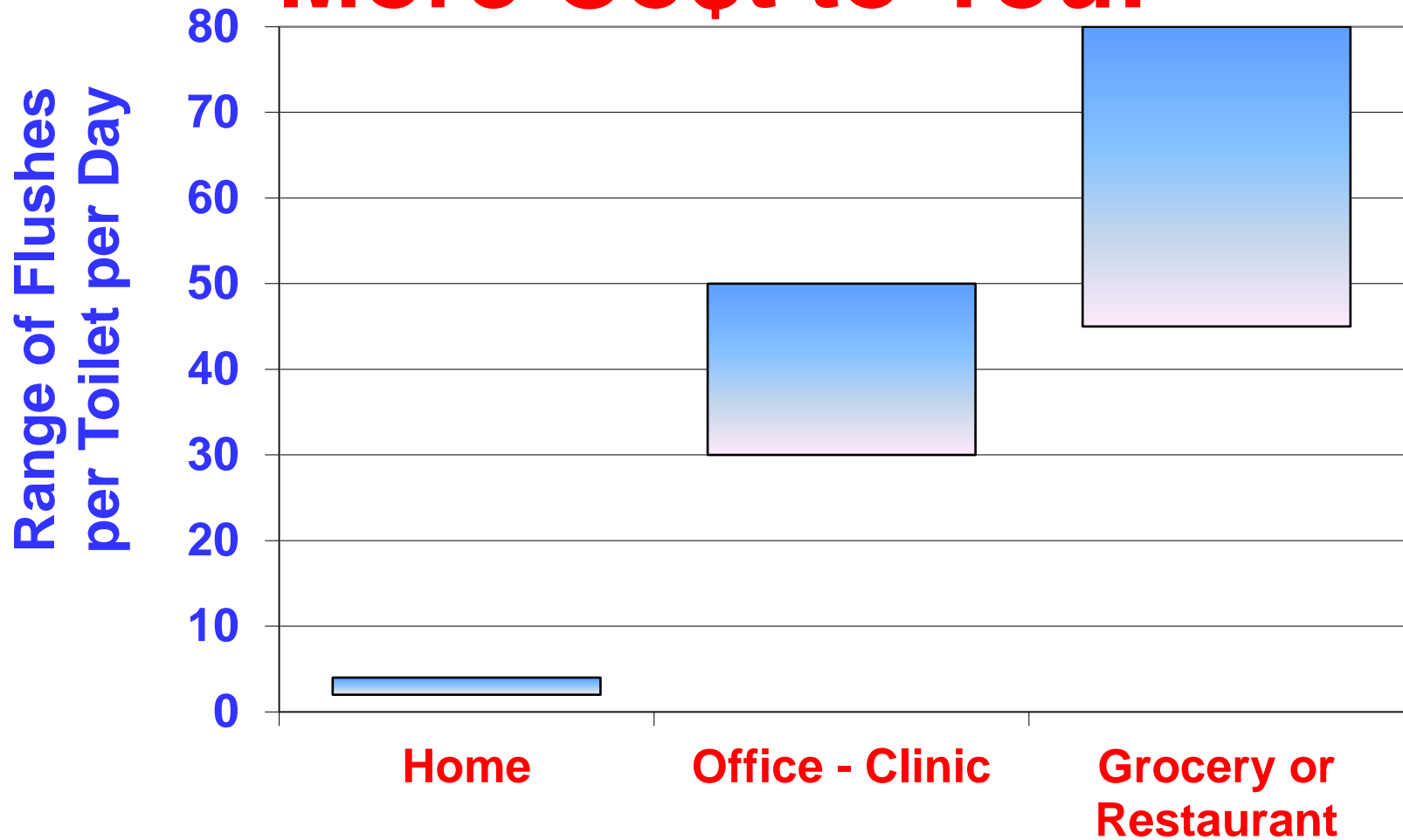
The True Cost of Water

- Water Cost
- Sewer/Pre-treatment
 - Energy
 - Chemicals
- Solid Waste Disposal
- Capital Equipment
 - Labor
 - Liability

Best case example
Cost for Toilet Flushing
in California Restaurants
Cents per Flush



More Flushes Mean More Co\$t to You!



Energy Costs for Heating Water

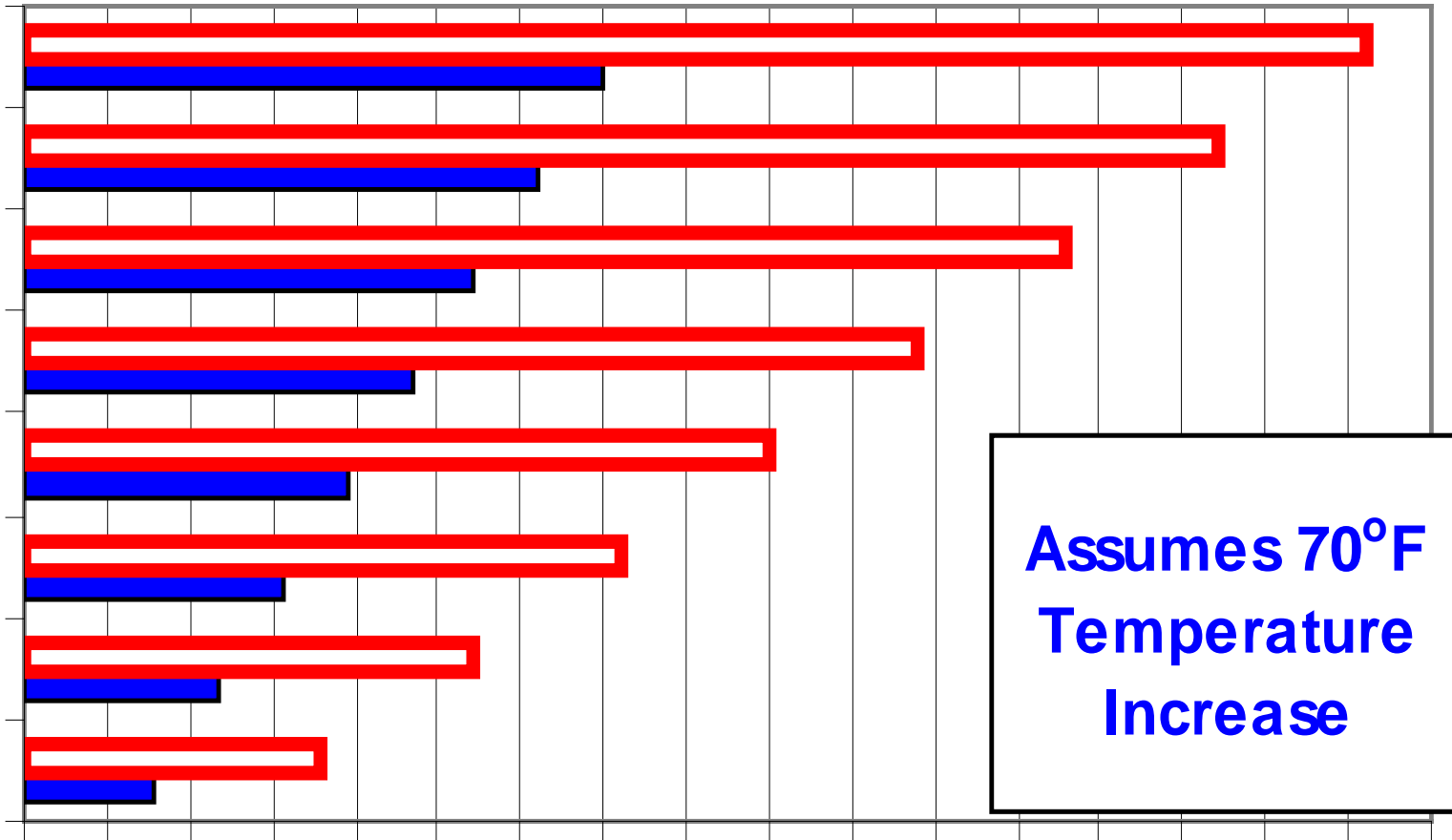
Cents/kWh or \$/MCF

18
16
14
12
10
8
6
4

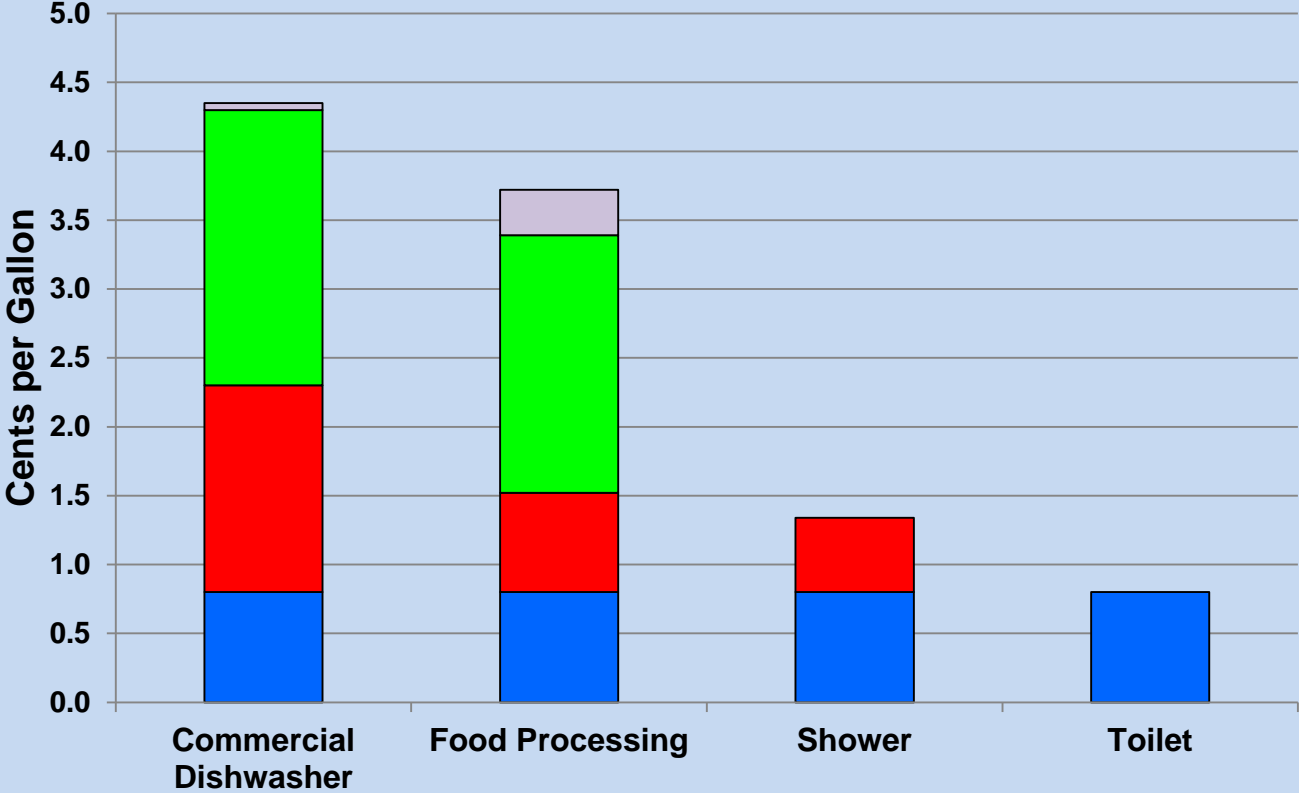
\$0 \$2 \$4 \$6 \$8 \$10 \$12 \$14 \$16 \$18 \$20 \$22 \$24 \$26 \$28 \$30 \$32 \$34
\$/1,000 Gallons

Assumes 70°F
Temperature
Increase

■ Gas □ Electric



Cents per Gallon of Water Used By Type of Use

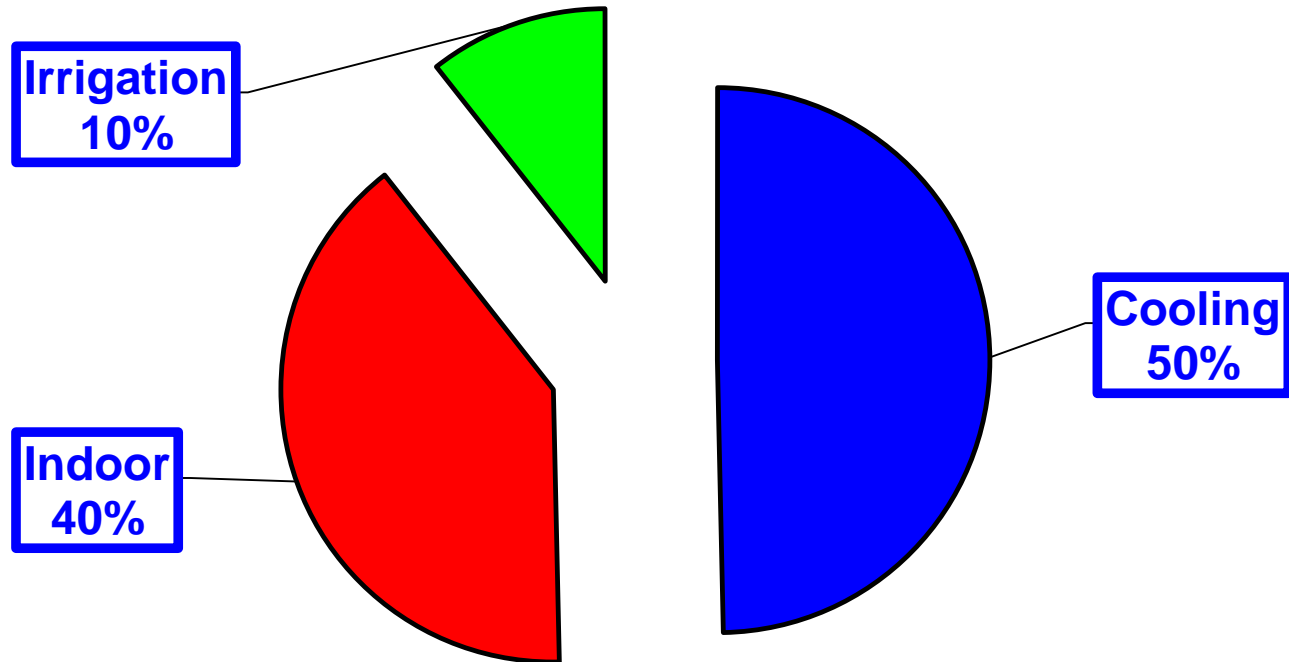


Water/Sewer **Energy** **Chemical** **BOD/TSS Charge**



**So what does all of this mean
to an ASHRAE member?**

Annual Water Use Downtown Office Building in Austin, Texas



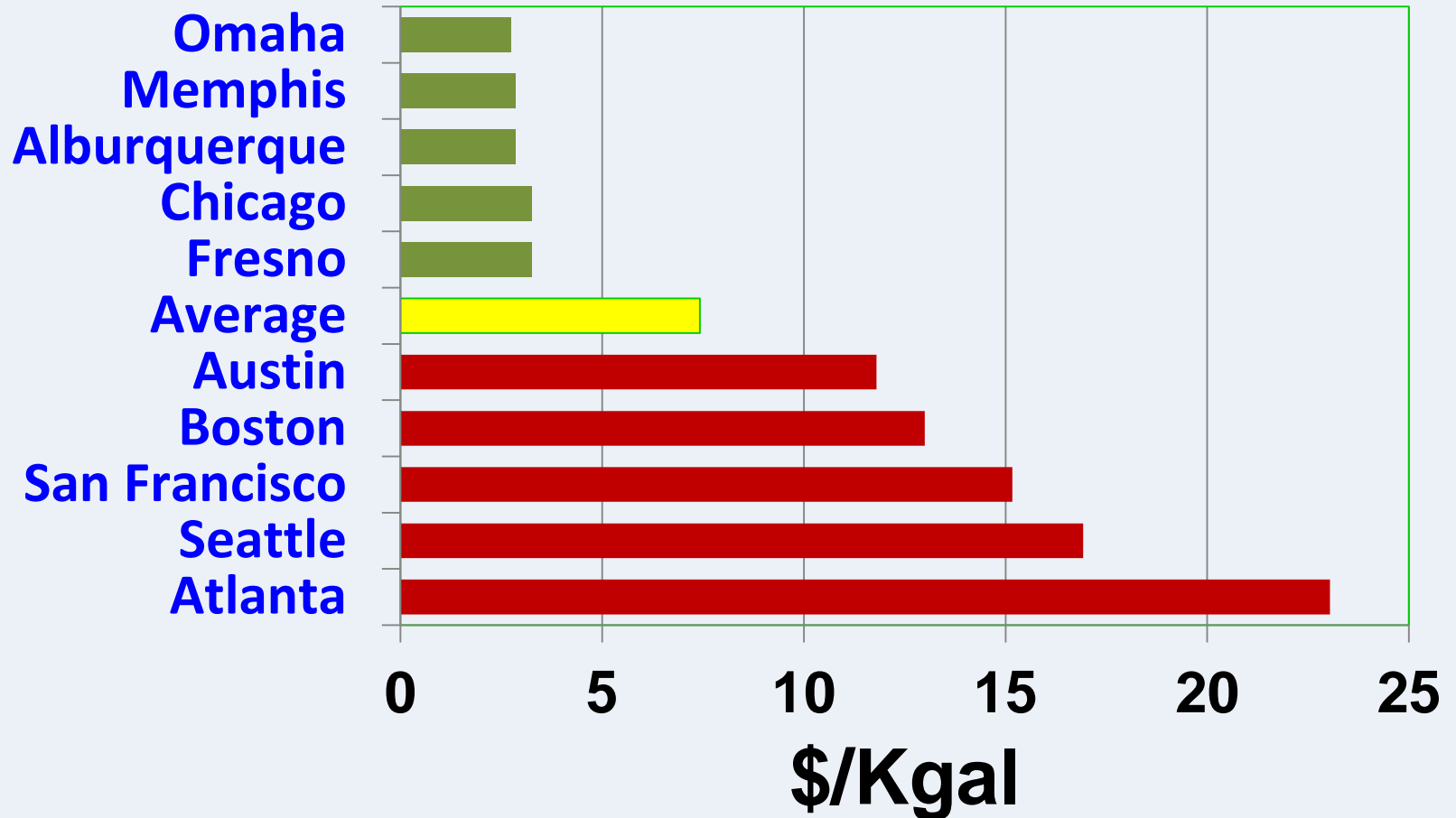
Example of a 750 Ton System

- On the hottest day assume it operates at 75% of capacity over that 24 hour period which corresponds to a high irrigation day for the water utility also. *(It adds to peak water use)*
- The system has a 25% load factor for the year.
- Cooling tower makeup is 2.25 gallons per ton hour.

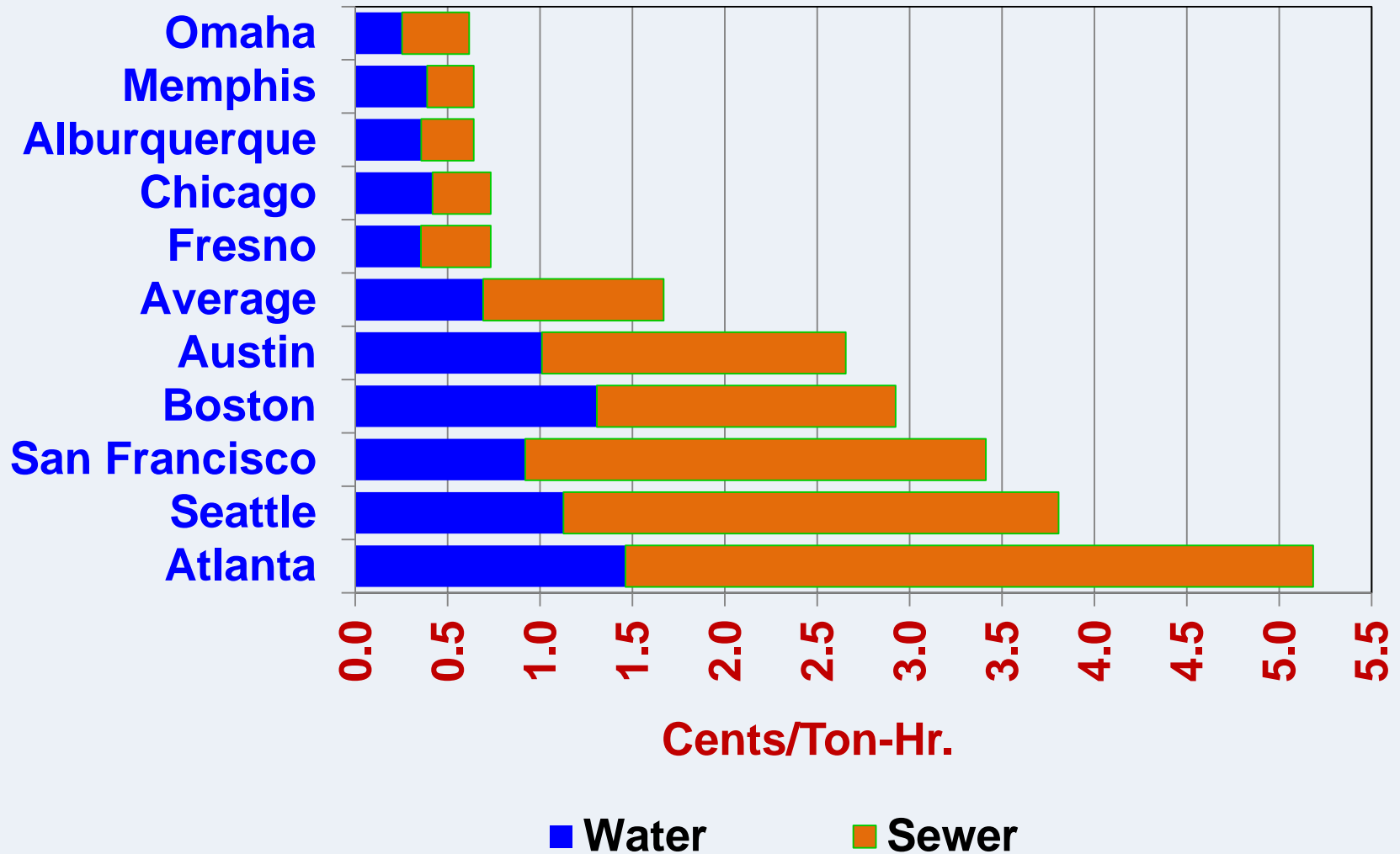
The Impact

- **Peak day use – 24,300 gallons a day**
- **Annual use – 3.7 million gallons a year**
- **Capital cost of water system to provide peak demand - \$48,600**
- **Cost per ton of capacity - \$65 per ton at a capital cost for water supply of \$2.00 per gdc.**
- **Energy Savings = 2 cents to 4 cents per ton-hour**

Example Combined Water & Sewer Costs for CII 50 Largest Cities



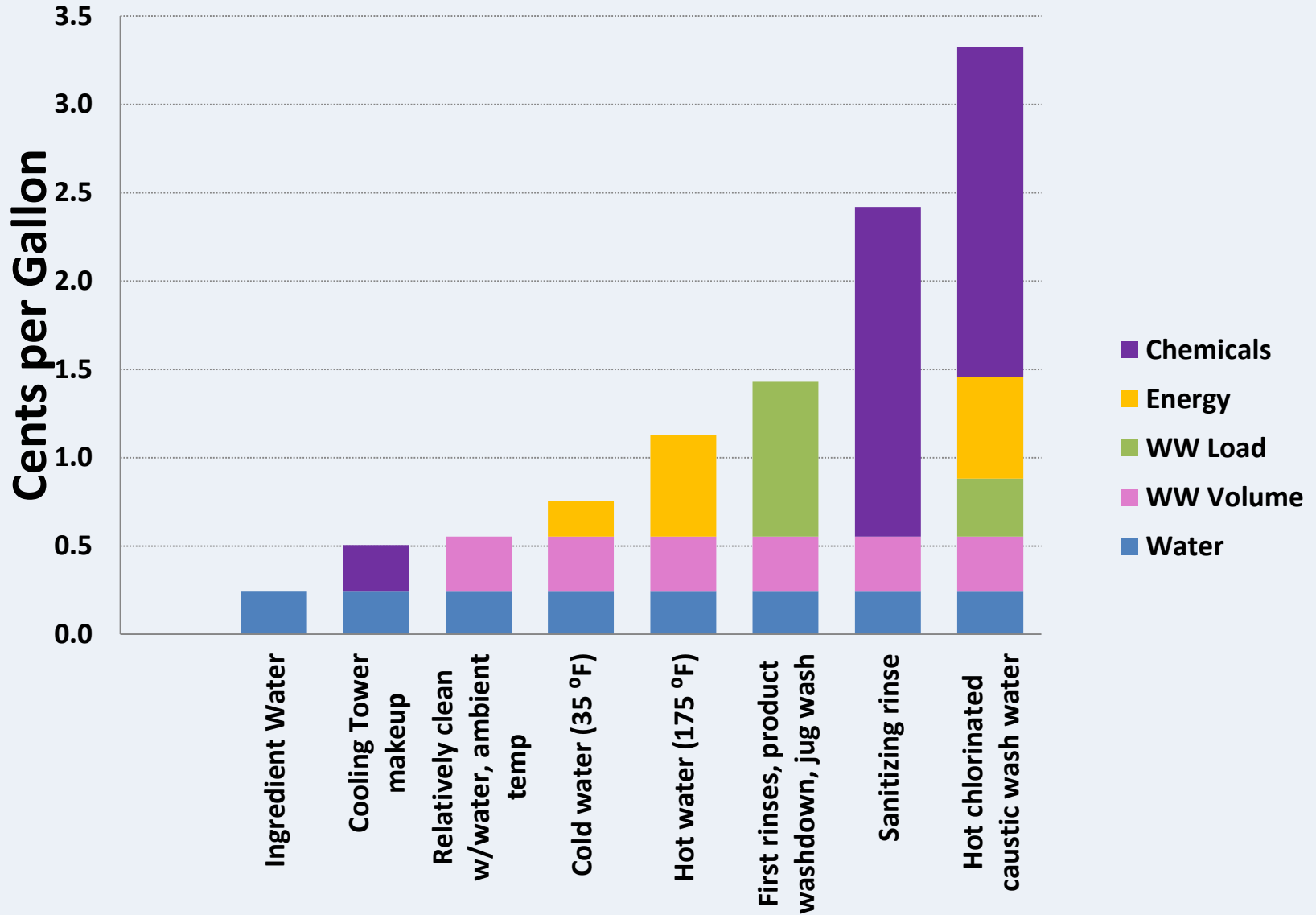
Cents per Ton-Hour for Cooling Tower @ 2.25 Gal/Ton-Hr.



Other Costs

- Treatment Costs – \$0.25 to \$8.00 per 1000 gallons 0.05 to 1.7 cents per ton hour.
- Labor costs and contract costs???
- Environmental costs beyond water use – TMDL, Salinity, Pretreatment, ??

Example of a Dairy: Water Cost



CII Financial Aid Program Elements

- Audit
- Rebates
- Vouchers
- Special Rates
- Grant Programs
- Tax Incentives
- Awards (Free Advertising)
- Performance Contract

Buy Back Programs

- **PV Costs = $\sum \text{Costs}_t / (1 + \text{discount rate})^t$**
- **Find a cost of capacity you are happy with**
- **Example – One dollar per gallon day of capacity**
- **Offer this to CII users with permanent reduction.**

Capacity Buy Back Programs are:

- *Easy to understand*
- *Tie \$\$ to savings performance*
- *Very applicable to CII customers*
- *Easy to Monitor*

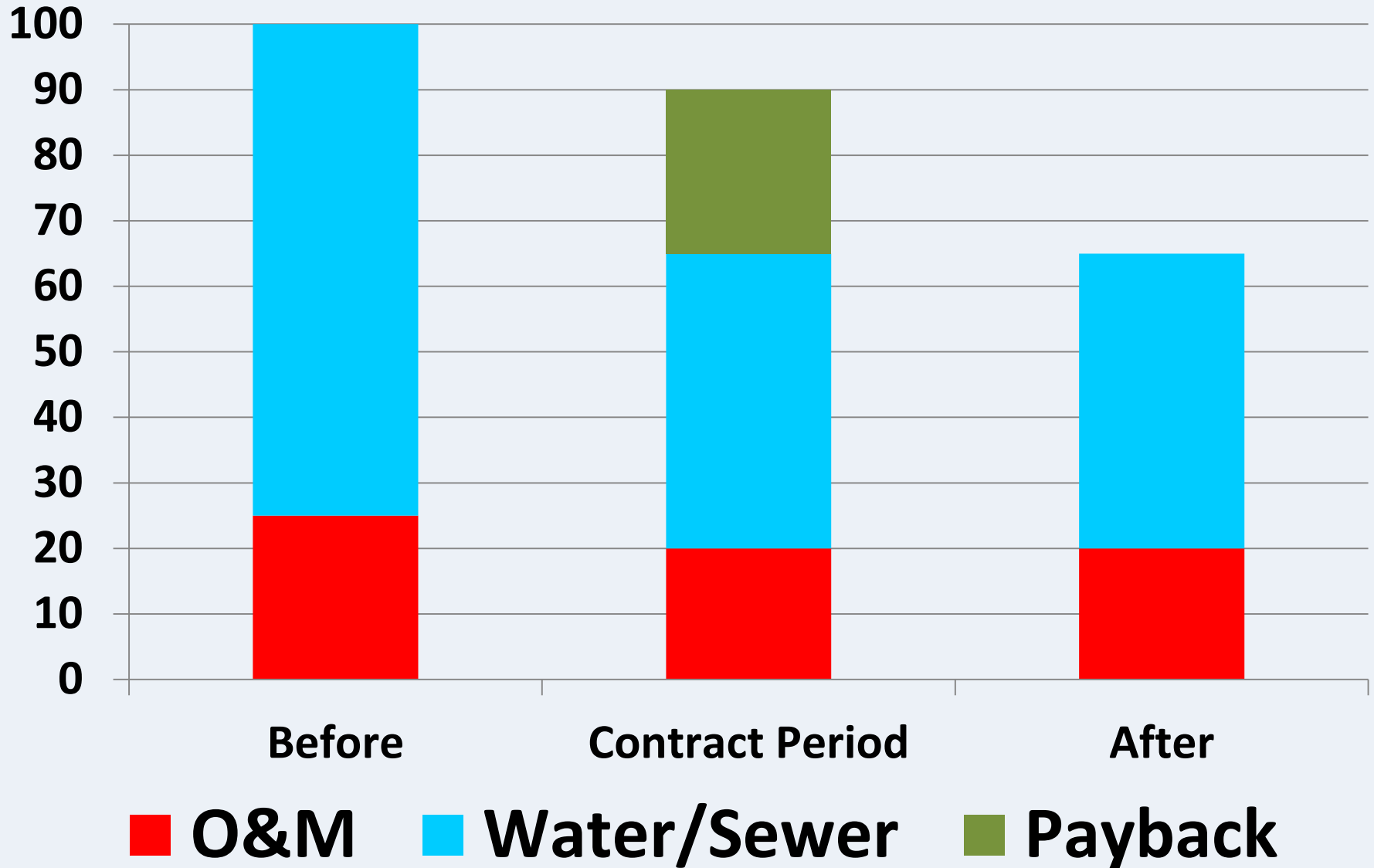
Joint Programs

- **Energy & Water**
- **Economic Development & Water**
- **Wastewater & Water**
- **Environmental Control & Water**

What Full Service WASCO's Offer

- Detailed auditing of ALL water uses
- Water and sewer use and cost analysis
- Analysis of energy savings associated with water conservation
- Product and system recommendations
- Turnkey pricing
- Implementation (design-build)
- Financing (including performance contracting)
- Measurement and verification of savings

Performance Contracting



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The Dollar Side of Water
Conservation in the CII Sector



www.watertmg.com

(703) 370-9070

GSA Contract # GS-21F-0038T