

# The Regulation of Water: Is it Different than Regulating Energy?

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Whisky is for drinking,  
water is for fighting over.

Attributed to Mark Twain



# Shared Federal / State Regulation

## Water

- No federal economic regulator; state regulators or local governmental authorities are responsible for economic regulation
  - States regulate privately owned companies; Wisconsin and a few other states regulate municipal water utilities
  - Municipalities regulate the government owned systems

## Electricity

- Shared economic regulation by the federal regulators (FERC) and the state regulators
  - FERC regulates wholesale transactions and markets
  - State regulators responsible for retail rates

# Environmental and Safety

## Water

- Federal regulators establish water quality standards
  - Implementation has a significant impact on the overall costs
- Concerns about security and attacks on the infrastructure

## Electricity

- Federal regulators establish air quality standards
  - Implementation has a significant impact on the overall costs
- Concerns about security and attacks on the infrastructure

# Supply Sources and Markets

## Water

- Most supply is owned by the utility
- No functioning wholesale water supply markets
- Water companies who do not own their own supply will enter into bi-lateral transactions for purchases
- A few regional water supply districts that serve more than one water system

## Electricity

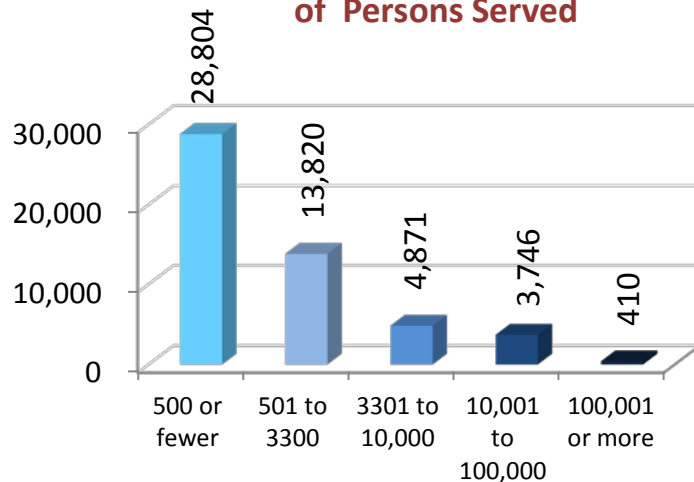
- Federal law drives some of the regulatory policies on markets and competitiveness
- Some utilities own generation and are vertically integrated while others have separated supply functions from distribution functions
- Competitive supply markets

# Utility Characteristics

## Water

- Most Capital Intensive
- Many small systems
  - Municipalities
  - Private Developments

Community Water Systems by Number of Persons Served

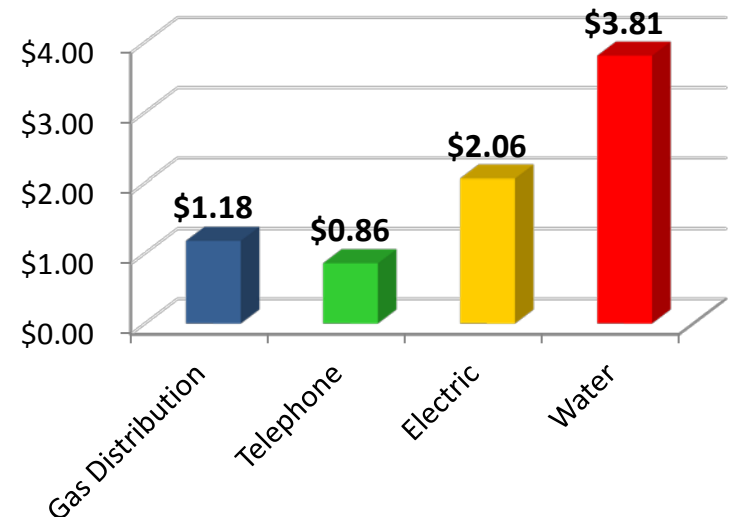


Source: U.S. Census Bureau Data 2012

## Electricity

- Capital Intensive
- Fewer larger utilities

Capital Invested per \$1 of Revenue



Source: AUS Reports and NAWC Policy Forum Report 2012

# Aging Infrastructure

## Water

- Old Existing Infrastructure
  - Cast Iron Distribution Pipe
  - Some estimate \$335 billion will be required over the next 20 years to replace existing infrastructure and achieve compliance with water quality requirements
    - From NAWC April 2012 Water Policy Forum Report
  - In 8 years, cost estimates to replace aging infrastructure for the next 20 years have doubled
- Increased leaks and water losses

## Electricity

- Old infrastructure but most of the costs are related to new investments rather than replacement of existing assets

The cumulative effect of the new investment required for water and electric utilities will have a significant impact on customers.

# Customer Expectations

## Water

- Higher expectations of quality (including taste) and affordability
  - The only utility service that is ingested
  - Necessity of life
- Most of the infrastructure is not visible day-to-day so customers think about costs and expenses of providing service less
- Not in the news as much

## Electricity

- High expectations of service quality but more tolerant of service interruptions
- Physically see infrastructure so customers think about changes and new investment more
- In the news more
  - Climate change
  - Transmission Siting
  - Environmental Rulings



# Supply Side Issues

## Water

- Impacts from changes in snowfall, rainfall
  - Droughts take a toll
- Population growth but limited aquifers and surface supplies
- New technologies must be found and made cost effective
  - Desalinization
- Multiuse Debates
  - Utilities
  - Irrigators
  - Ranchers
  - Recreation

## Electricity

- Weather has a more limited impact on supply (except for hydro electric); greater impact on demand
- New technologies must be found to address climate change and growth in demand
  - Supply is not finite

# Demand Side Issues

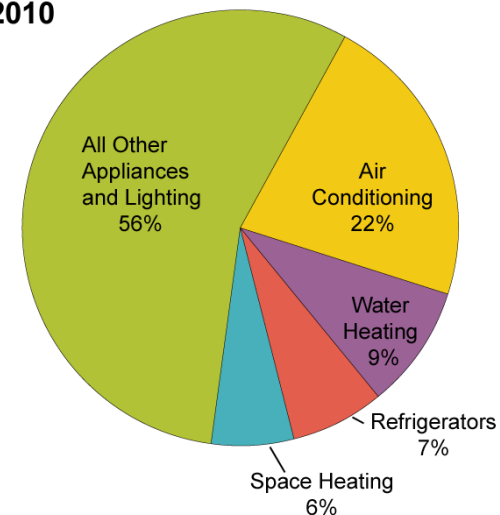
## Water

- Decline in per household usage
  - Per a study by AE2S Financial Group, the average monthly residential water usage has declined
    - 2005 = 6,712 gallons
    - 2012 = 4,979 gallons
- Conservation pressures and usage restrictions
- Efficient Appliances

## Electricity

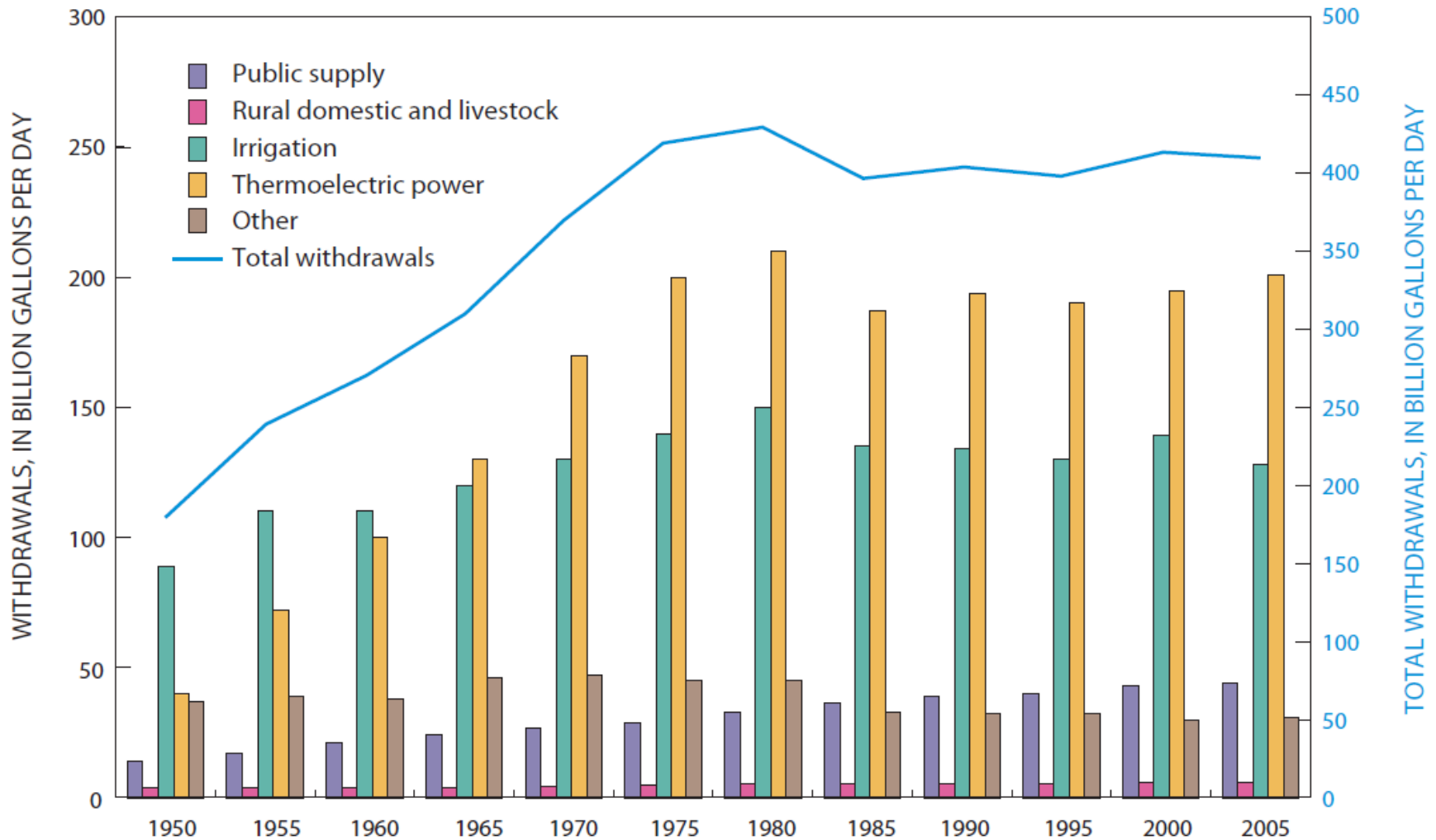
- Per customer usage growing
  - U.S. electricity use in 2011 was more than 13 times greater than electricity use in 1950 (from US Energy Information Administration)

How Electricity Is Used in Homes, 2010



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2011*, Table 4, Reference Case. Projections based on the Residential Energy Consumption Survey 2005.

# Demand for Water



Trends in total water withdrawals by water-use category, 1950–2005.

# Rate Regulation

## Water

- Arguments about regulatory lag and not earning authorized return
- Cost based (ROR, operating ratio) – few incentive based programs
- Expedited rate case procedures for small companies in many states

## Electricity

- Arguments about regulatory lag and not earning authorized return
- Mix of cost plus, price caps, revenue caps, other incentives
- Lengthy, data intensive proceedings

# Rate Design

## Water

- Usage based, monthly meter reads
  - Still a few companies without meters so a flat monthly rate
- Based on the size of the meter (3/4", 1", 2" – similar to natural gas)
  - Separate rate for fire suppression
- Flat or inverted block rates
  - Flat Customer Charge
  - Usage Based Charge
  - Commodity Surcharge
  - (No Demand Charge)

## Electricity

- Metered, usage based
  - Advanced rate designs will be time based (time of use, critical peak pricing)
- Based on customer classifications and load research data
- More rate design options (time based, seasonal, flat for all usage, inverted block, on-peak/ off-peak)
  - Flat Customer Charge
  - Usage Based Charge
  - Demand Charge (Commercial)
  - Commodity Cost Surcharge

# Surcharges and Trackers

## Water

- Industry is seeking ways to increase/stabilize earnings and avoid rate cases through surcharges
  - Infrastructure improvements
  - Weather Normalization
  - Conservation
  - Lost Revenues due to declining usage
  - Expense Tracking (electricity, taxes, etc)
- States respond differently to requests

## Electricity

- Industry is seeking ways to increase/stabilize earnings and avoid rate cases through surcharges
  - Renewable Generation
  - New Transmission
  - Conservation and Demand Side Management
  - Decoupling
  - Bad Debt
- States respond differently to requests

# Water Energy Nexus

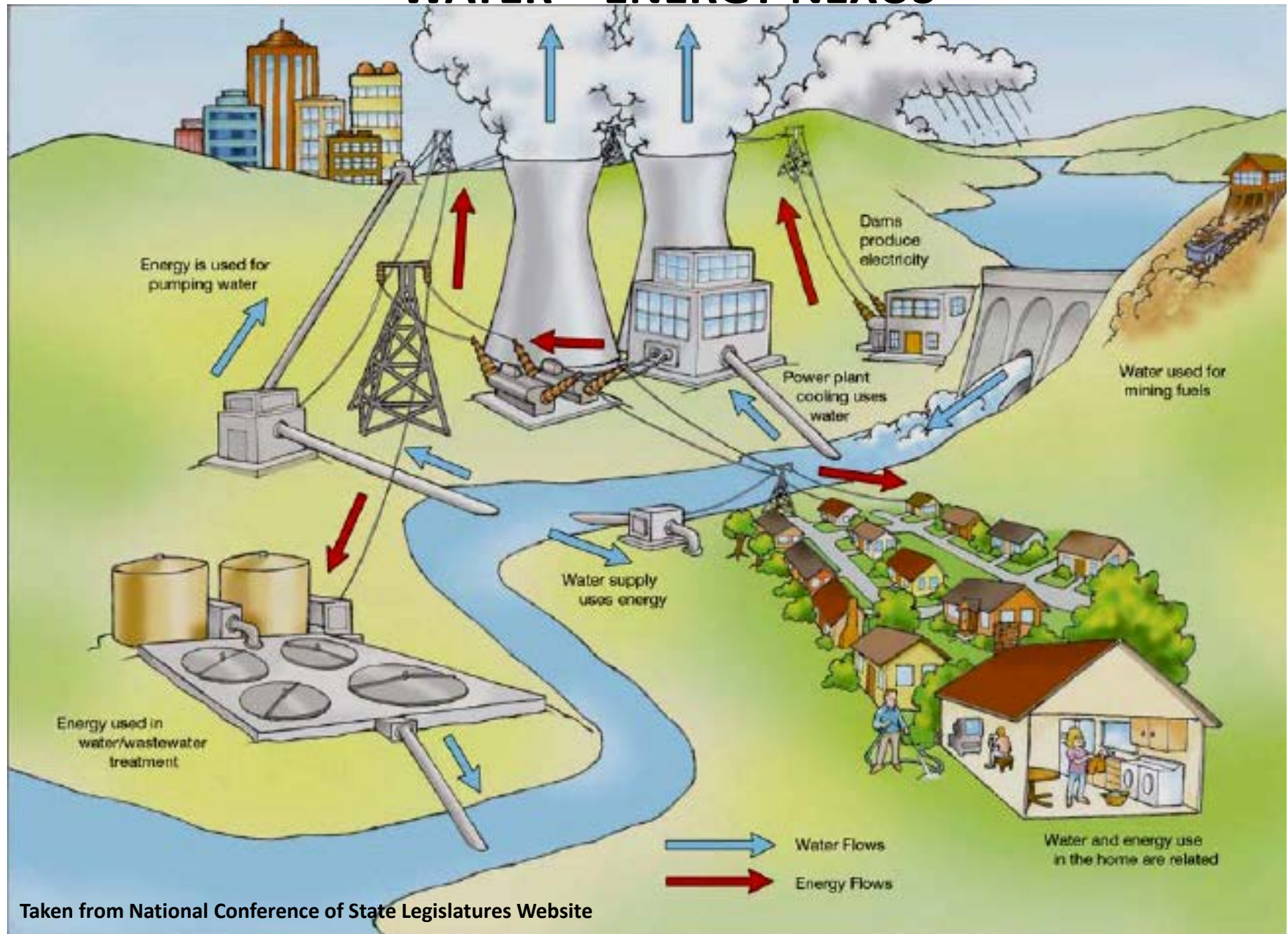
## Water Use for Electricity

- Cooling Generating Plants
- Hydroelectricity
- Oil / Natural Gas Drilling

## Electricity Use for Water

- Desalinization
- Water Treatment
- Pumping and Moving through Distribution System

# WATER – ENERGY NEXUS





A man from the West will fight over  
three things: water, women and gold,  
and usually in that order.

Senator Barry Goldwater

