

Drops and Watts: Connecting Water and Energy Use and Efficiency

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The Perfect Storm



Why Us?

- SRP
 - Formed in 1903 – Federal Reclamation Act
 - Became SRP Agricultural Improvement and Power District
 - Providing water and power to the Phoenix area
 - Today SRP is the 3rd largest public power provider in US
 - 935,000 retail power customers
 - Peak demand Summer 2007
 - FY08 Retail peak – 6,578 MW
 - FY08 System peak – 6,819 MW
 - Largest provider of raw water to the Phoenix area
 - Approximately 1.0 million acre feet annually
 - Valley Population – 3.5 million



Why Us?

- Scottsdale Water Resources Department
 - Water and wastewater services
 - Comprehensive water resources planning
 - Water service connections
 - ~81,000 residential and ~6,000 commercial
 - Population ~ 241,000
 - Department goals
 - Communication and education
 - Sustainable water supply
 - Assured, high quality water
 - Increased water system safety and security
 - Best-in-class workforce
 - Operational enhancement through technology



Water in Arizona

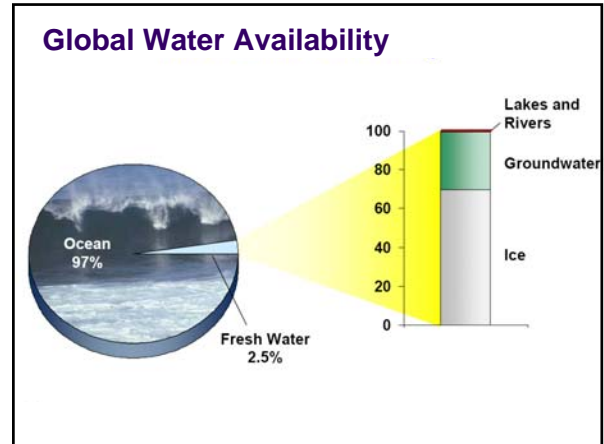
- Surface water
 - SRP, Colorado River
- Groundwater
- Reclaimed water



Water in Arizona

- Management strategies
 - Historically - acquire more supply
 - Cost of treatment
 - Expanded infrastructure
 - Now proactive
 - Recognize water is a finite resource
 - Be prepared to deal with climatic and supply droughts
 - Extend existing water supplies through advanced treatment technologies
 - Promote water conservation





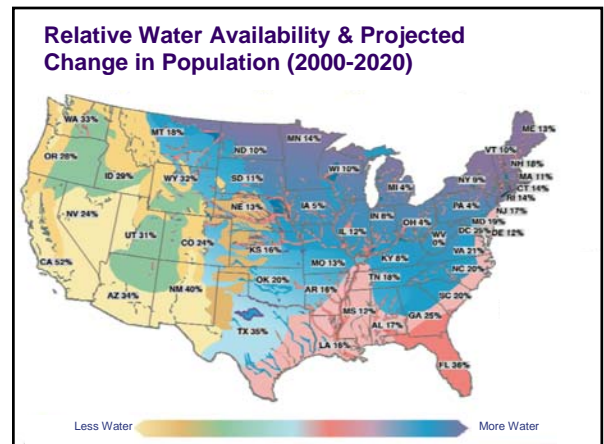
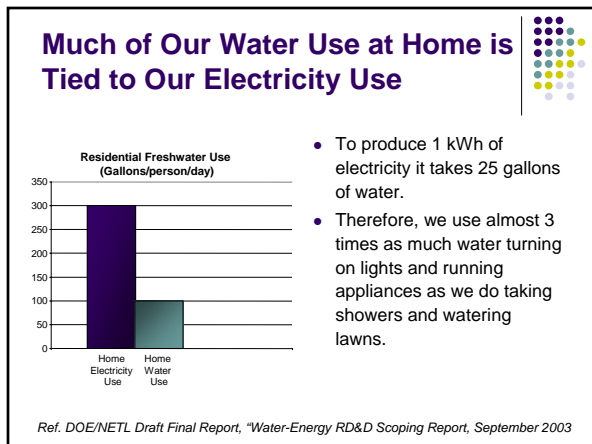
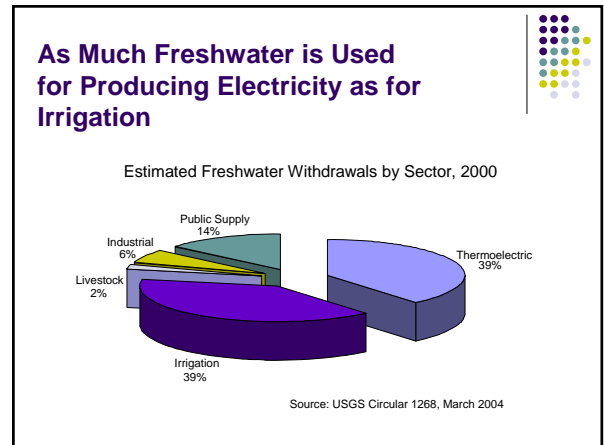
Water and Energy Inextricably Linked

Thermoelectric power generation is second largest user of water in United States

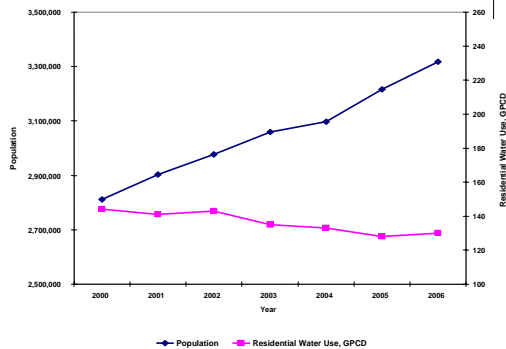
80% of cost of treating, processing, and pumping water is for energy

Clean, Affordable Energy

Clean, Affordable Water

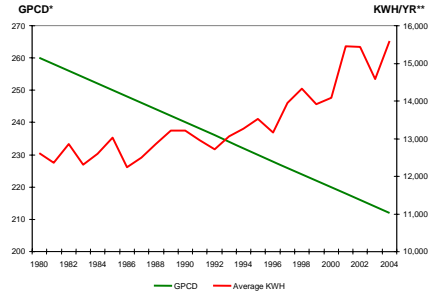


Valley Population Growth and Residential Water Use



Water and Energy Conservation

Water use is declining while energy demand continues to grow



* gallons per capita per day, City of Phoenix ** SRP average annual residential usage

2006 Energy Star Savings



- Saving energy = saving water
 - 151,700 million kWh/year
- Saving water = saving energy
 - Direct – 140 mgd
 - Indirect – 180 mgd
- Air emissions deferred
- Cost effective savings
- EPA's WaterSense program is coming

Source: Water and Energy; Leveraging Voluntary Programs to Save Both Water and Energy, ICF Int'l, March 2008

SRP's Promotion of Arizona Rinse Smart

- 1,777 low water use, high pressure pre-rinse spray nozzles installed in commercial kitchens Valley-wide
- Unique partnership opportunities
 - SRP and ADWR
 - SRP Water and Power
 - SRP and its electric customers
- Water and energy savings
 - 15,800,000 gallons of water saved annually
 - 1 million kWh and 161,000 therms saved annually
- 750 tons of carbon saved annually
- \$171-194/avg. annual savings



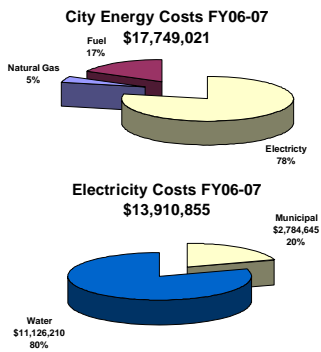
SRP Water-saving Programs



Water's Carbon Footprint

- SRP's research on carbon footprint associated with water use is in early stages
- SRP system largely gravity fed
- Used CAP energy for this calculation
- CO₂ associated with water use in Phoenix area equates to the annual greenhouse gas emissions from nearly 200,000 automobiles

Scottsdale Municipal Energy Use



Supply vs. Demand

- Faced with challenge of increasing water demands due to increased population in a desert environment

- Water Resource Alternatives
 - Use surface water and not groundwater
 - Reclaimed water
 - Use unused water to recharge the groundwater aquifer
- Water Conservation Program
 - Build a water conservation ethic
 - Move toward sustainable use of water supplies



Scottsdale Water Supply

- Sources
 - CAP 59%
 - SRP 11%
 - Groundwater 19%
 - Reclaimed water 11% (golf courses)
- Safe yield achieved in 2006 & 2007
 - Increased surface water
 - Optimizing groundwater recharge
 - Reclaiming and reusing effluent
 - Promoting water conservation

Importance of Water Conservation

- Long-Range Planning Tool
 - Lifestyle in the desert – not only during drought
 - Helps manage resources by decreasing demand
 - Potable (drinking) water saved for future generations
- Environmental Tool
 - Protects groundwater supplies from excessive depletion
 - Reduced energy use means reduced greenhouse gas emissions
- Economic Tool
 - Deferred or downsized water and wastewater treatment infrastructure
 - Reduced treatment & delivery costs
 - Lower utility bills for customers who conserve
 - Lower energy costs



Focus on Water Conservation

- Federal
 - Plumbing code, took effect in 1994
 - Showers dropped 8 gpm → 2.5 gpm
 - Faucets dropped 7 gpm → 2.2 gpm
 - Toilets dropped 7 gpf → 1.6 gpf
- EPA WaterSense
 - Promoting and enhancing market for water efficient products and services
 - Voluntary
 - Helps identify water efficient products and services



Focus on Water Conservation

- State
 - Groundwater Management Act, 1980
 - Problem: overdrafted groundwater and land subsidence
 - Goal: Eliminate overpumping of groundwater in major urban areas of the state ("safe-yield")
 - Water conservation regulatory programs
 - GPCD
 - NPCCP
 - "Culture of Conservation" – Governor Janet Napolitano



Local Program Development

- Analyze system needs and identify where savings most needed
- Evaluate
 - Water users
 - Types of uses
 - Water savings potential



Scottsdale Program Overview

- Both a residential and non-residential focus
- City's own efforts
- Ordinances
- Financial incentives/rebates
- Education and assistance

Scottsdale Program Components

- City efforts
 - City truck wash recycles water
 - Replaced toilets in 2 largest city office buildings with 1.6 gpf
 - Parks uses weather station to adjust turf irrigation



Scottsdale Program Components

- Ordinances
 - Limitations on water features
 - Limitations on turf
 - Limitations on model home landscaping
 - Requirement of a conservation plan for new nonresidential customers with demand >10 AFY
 - Prohibition of escape of water



Scottsdale Program Components

- Financial Incentives
 - Rebates for water-saving technologies
 - Showerheads and toilets
 - Hot water recirculators
 - Irrigation controllers
 - Turf removal (residential homeowners, residential common areas, and commercial)



Scottsdale Program Components

- Public Awareness/Education
 - Water supply sources and conservation
 - Resources must be carefully managed and used wisely
 - Promote water conservation as a way of life in the desert – not a response to drought
 - HOW to conserve water
 - Landscapes reflect sensitivity to local environment and climate - Xeriscape



Methods of Education



wateruseitwisely.com

amwua

- School puppet show & assemblies
- Free landscaping workshops
- Free residential landscape audits
- Distribution of free literature
- Marketing
- Regional media campaign

- Leverage regional partnerships

Free Literature



Reducing Indoor Water Use

- Structural fixes
 - Toilets
 - Showerheads
 - Aerators
 - Efficient appliances
- Behavioral fixes
 - Check for leaks
 - THINK!



Reducing Outdoor Water Use

- Convert to Xeriscape
 - Water-efficient landscape using low water use plants
 - Not zero-scape
 - Low water use vegetation while still beautiful and functional
- Audit the irrigation system
 - Leaks
 - Misaligned sprinkler heads
 - Correct timing



Scottsdale's Xeriscape Garden

"Demonstrating the beauty of saving water"

-Robyn Baker



Paradigm Shift



This is a
water-saving device!

This is an
energy-saving device!



Closing Thought...

*"95% of the energy efficiency goals
could be met in water efficiency
programs at 50% of the cost"*

*Mary Ann Dickinson
California Urban Water
Conservation Council*



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