



GREELEY AND HANSEN

The Case for Sustainable Water Planning

**NACWA
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The Aqueduct from Segovia, Spain, was designed built and operated by the Roman Empire nearly 2000 years ago to transport water from more than 10 miles away. It just recently stopped operations.

Andy Richardson

The Case for Sustainable Water Planning

- What is Sustainability?
- Historical and Current Municipal Water Use Policies Impact on Sustainability
- Water Industry Trends That Affect Sustainability
- AWWA State of the Water Industry Results
- Sustainable Water Planning Strategies
- Summary



Definition of Sustain



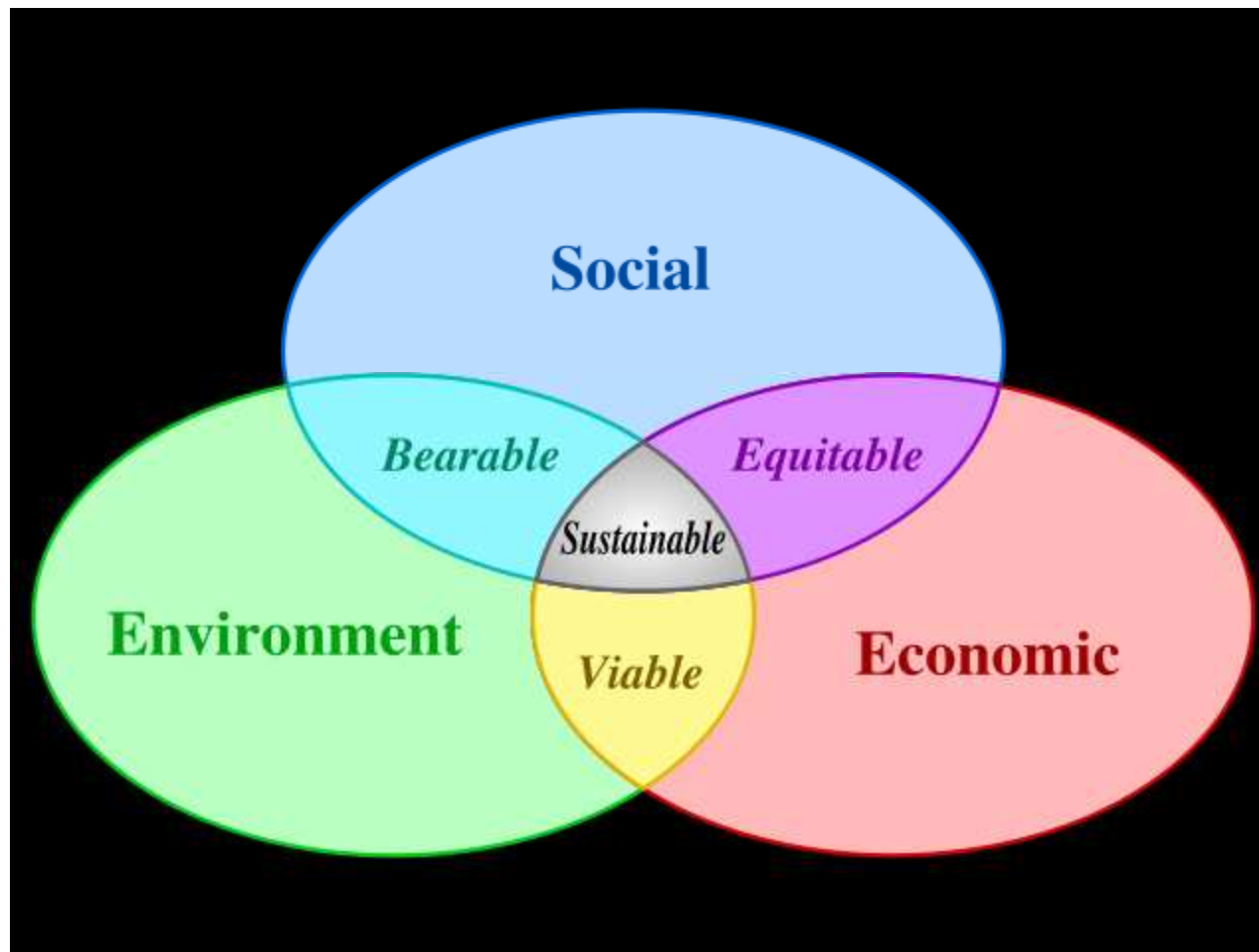
- What Is Sustainability?
- Webster Says: “To Maintain; Keep In Existence; Keep Going; Prolong.”
- EPA Says: “Meeting the Needs of the Present Without Compromising the Ability of Future Generations to Meet Their Own Needs.”

Basic Rules for Sustainability

- Renewable Resources (Groundwater, Fish) – Must Be Used No Faster than the Rate at Which They Regenerate
- Nonrenewable Resources (Fossil Fuels, Mineral Ores) – Must Be Used No Faster than Renewable Substitutes for Them Can Be Put Into Place
- Pollution and Waste – Must Be Emitted No Faster than Natural Systems Can Absorb Them, or Render Them Harmless



Sustainable Development (Balancing People, Planet and Profit)



Source: Johann Dvéo

Goal of Sustainable Water Supply Planning

To Provide
Adequate Supplies
of
Clean Water
For All Users
At Reasonable Cost



The United States Past and Present Water Use Policies

- Blessed With an Abundance of Fresh Water
- Fueled Industrial and Economic Growth
- Inheritors of Magnificent Water Systems
- Modern Practices of Disinfection
- Modern Distribution and Collection Systems
- “Go West-Young Man-Go West”
 - 1920s Federal Bureau of Reclamation
 - 1972 – Clean Water Act (Wastewater Treatment)



Institutional / Structural – Water Rights

- Riparian Water Right System (Surface Water) – 29 Eastern “Wet” States:
 - Ownership of Land On Waterway Determines Right
 - In Times of Scarcity, All Must Reduce Rights
- Prior Appropriation Water Right System (Surface Water) – 9 “Arid” Western States:
 - First In Time, First In Use: Can Be Sold as Rights Only
 - Senior and Junior Rights – In Times of Scarcity, Some May Not Get Water
- Groundwater Rights Varies by State
- Reclaimed Water Rights- “John F. Long” Law Suite



Structural (Environment) – Decentralization of Water Systems

- Too Many Small to Medium Systems
(51,300 Serve 81 Million)
- Inefficient Service Model
(Large System = 3,500 Serve 204 Million)
- Significant Regulatory Burdens
- Water Supply Challenges
- Under Pricing of Water (86% Are Public Systems)
- Only 424 Systems Serve >100,000 People
(8% of Systems Serve 82% of Population)



Structural (Environment) – Decentralization of Wastewater System

- 34,000 Community Wastewater Systems
- 24,000 Systems Include Collecting and Treatment, with 750 Combined Sewer Systems
- Too Many Small to Medium Systems (16,800 Serve 27 Million)
- Inefficient Service Model (Large System = 7,200 Serve 263 Million)
- Significant Regulatory Burdens
- 1,255 Systems Include Stormwater Management Programs
- Under Pricing of Wastewater Treatment



* EPA Needs Survey Data

Structural – Political Structure of Water and Wastewater Systems

- Local Government-Owned Community Water Systems
 - Budget Part of Local Government; Rates Set through Political Process
- Independent Government Authorities
 - Controlled By Independent Board; Operate as an Enterprise
- Privately-Owned Community Water Systems
 - Investor-Owned or Privately Held; Rates Regulated by PUCs
- Public-Private Partnerships
 - Government Retains Ownership; Contract for Operations



Economic – Decentralization of Water Industry

- Need for Survival – Water Is “Priceless”
- Historical Pricing – Cost of Capture, Treatment, Conveyance
- Economic Water Policy – Varies By Location
- Sustainable Economic Policy – “Full Cost of Service Pricing”
- Future Price May Be On Vol

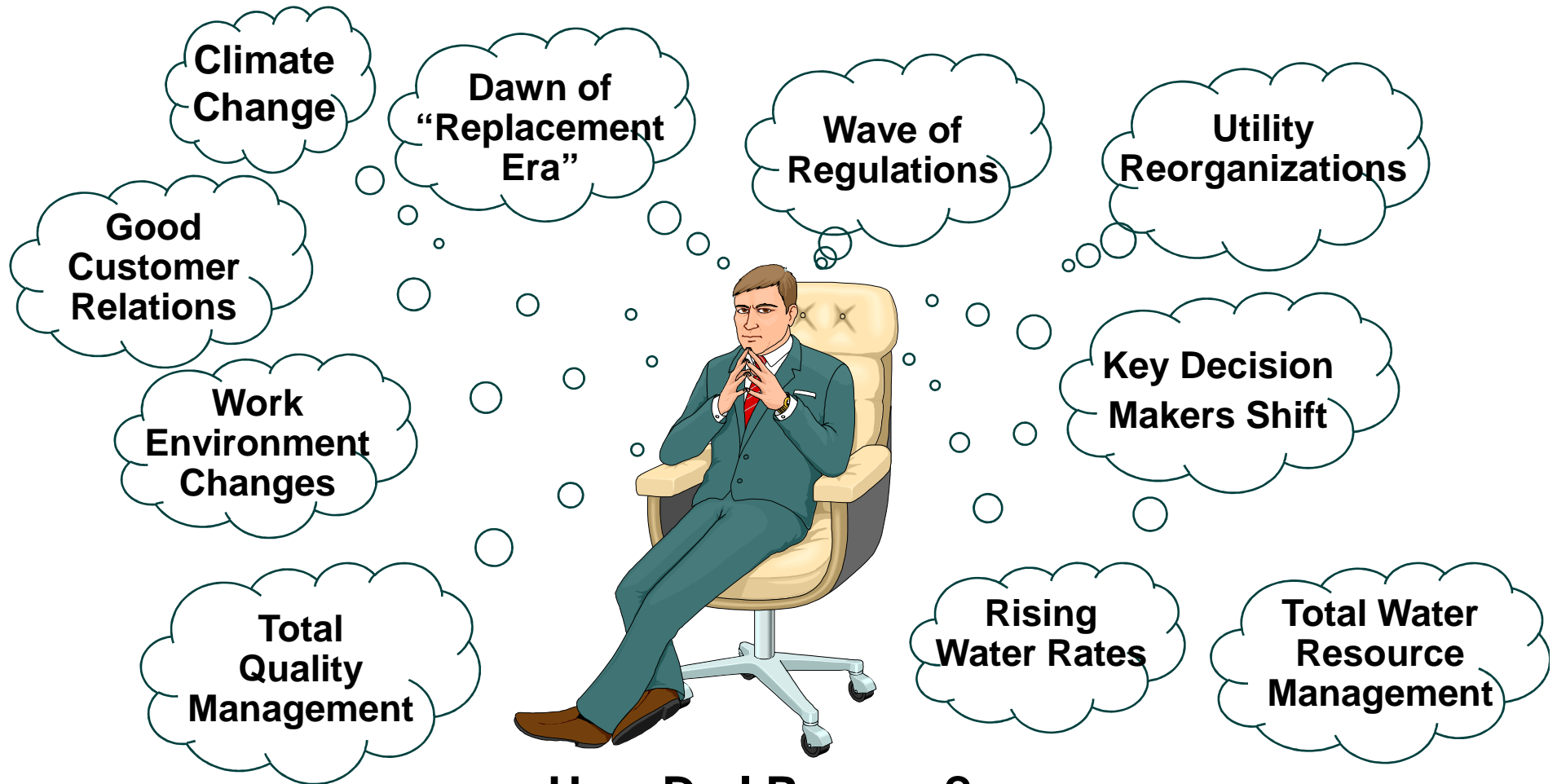


Social

- Historically Water Industry “Silent Servant”
- Early 20th Century Water Projects Required
- 1960s Social Movement – Environment First, All Else Second
- What Are the Environment Costs of Water Delivery?
- The Environment Has a Better PR Firm than You



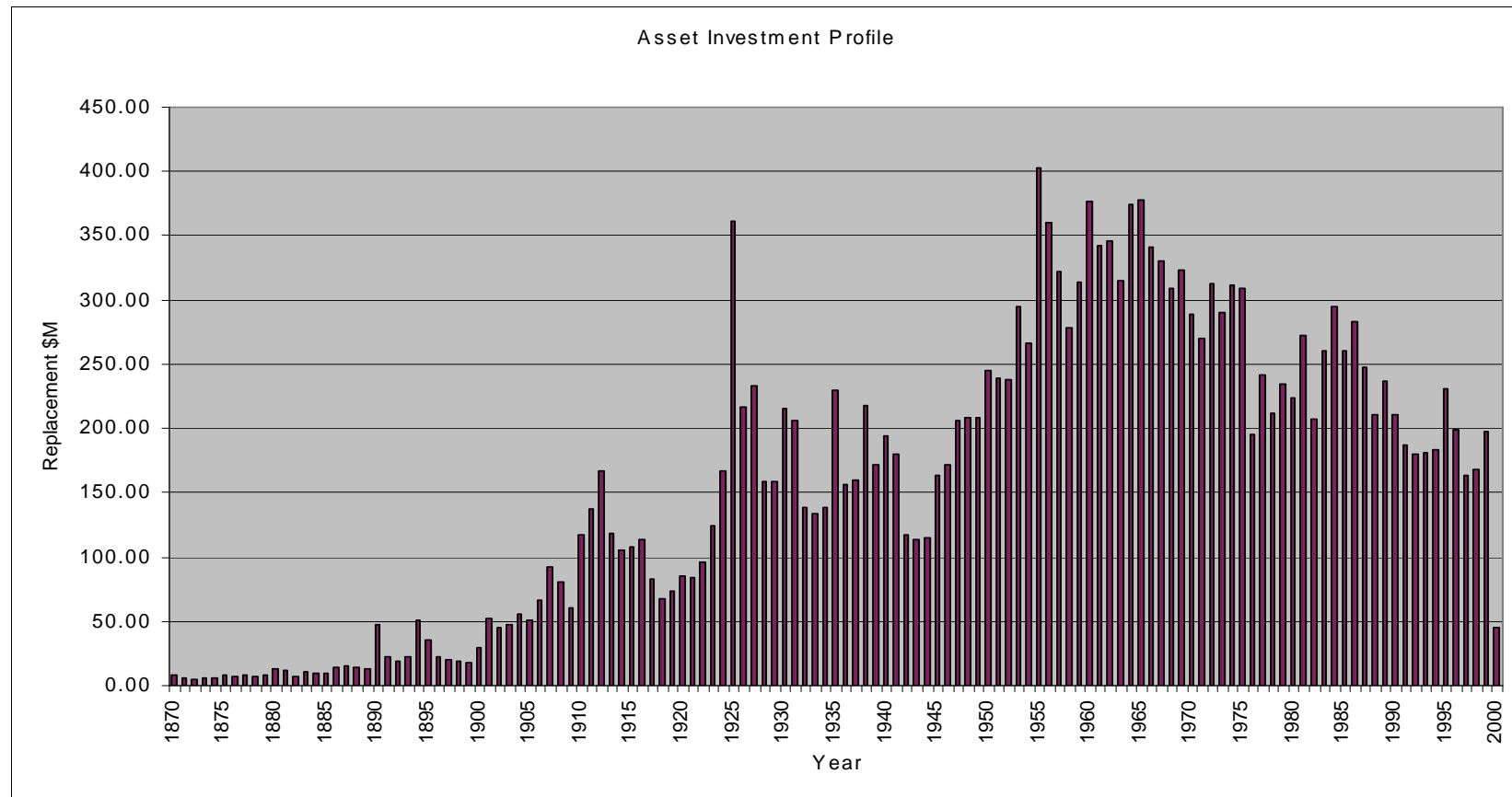
Water Industry⁽¹⁾ Trends That Affect Sustainability



How Do I Prepare?

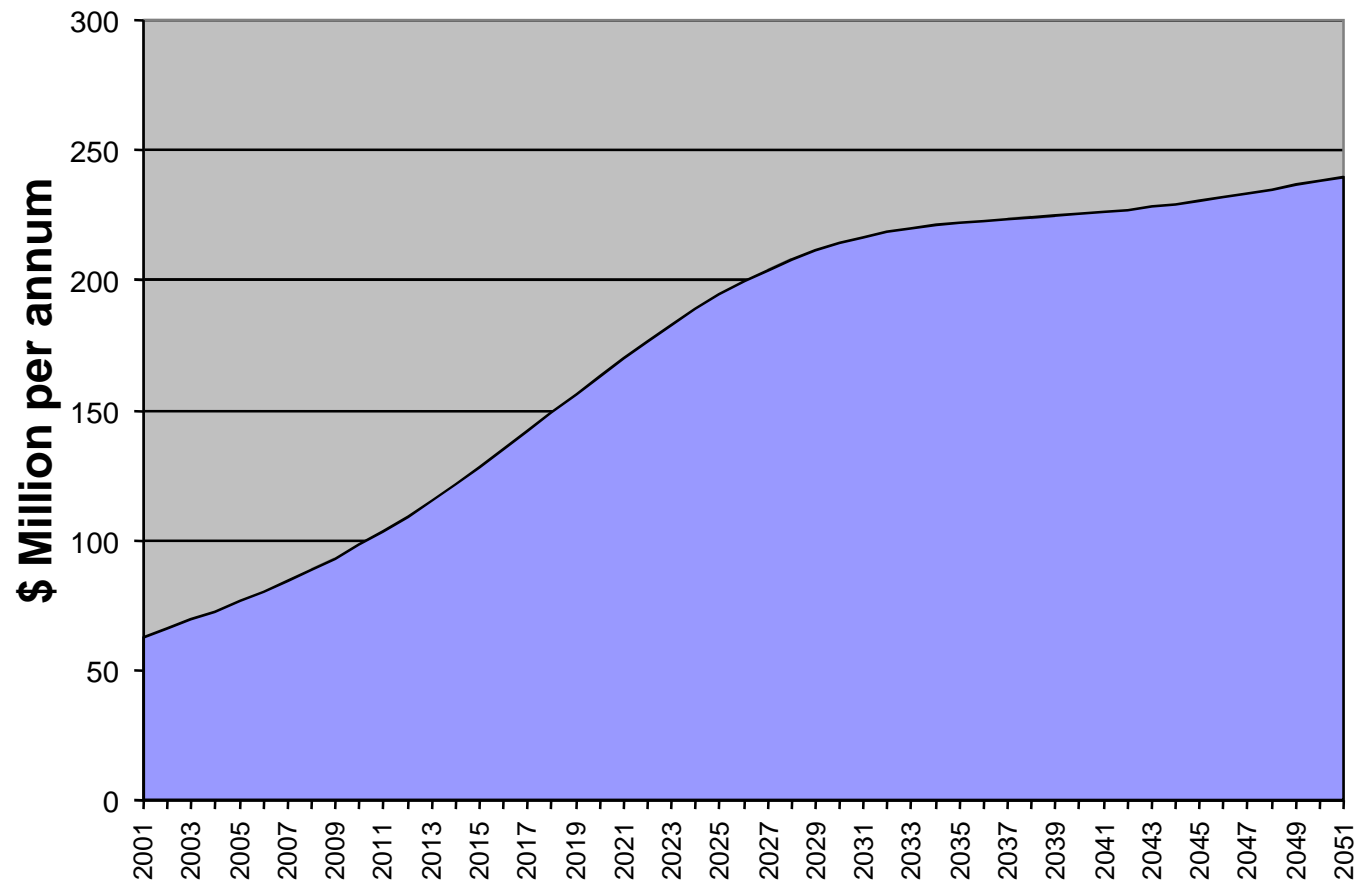
(1) Based on various studies performed by AWWA and AWWARF

Back to the Future



Main Replacement Costs

Projected Main Replacement Expenditure Due to Wear-Out for 20 Utilities



10 Trends That Will Shape Future

1. Dawn of “Replacement Era”
2. Wave of New Regulations
3. Utility Reorganizations
4. More Customer Focus / Awareness / Going Green
5. Key Decision Markers Shift
6. Greater Efficiency / TQM
7. Total Water Resource Mgmt / Water Reuse
8. Work Environment Change
9. Climate Change
10. Rising Water / Wastewater Rates



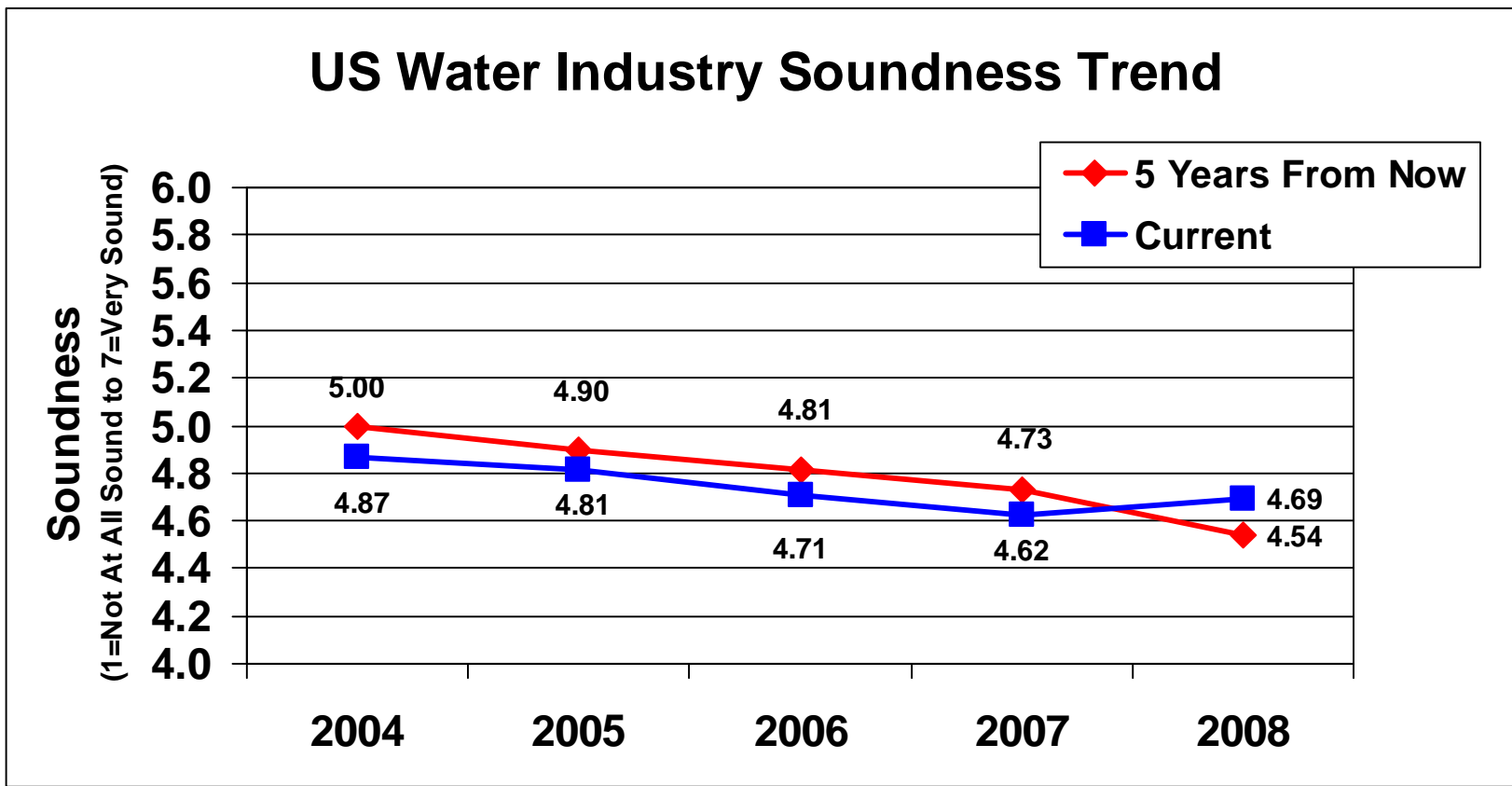
State of the Industry (SOTI) Report

- An Annual AWWA “Report” Highlighting AWWA/Industry Perspectives Supported By Primary and Secondary Research
- “Where Is the Profession Going?”
- “What Are We Going to Have to Pay Attention to In the Future?”



U.S. Water Industry Soundness Trend

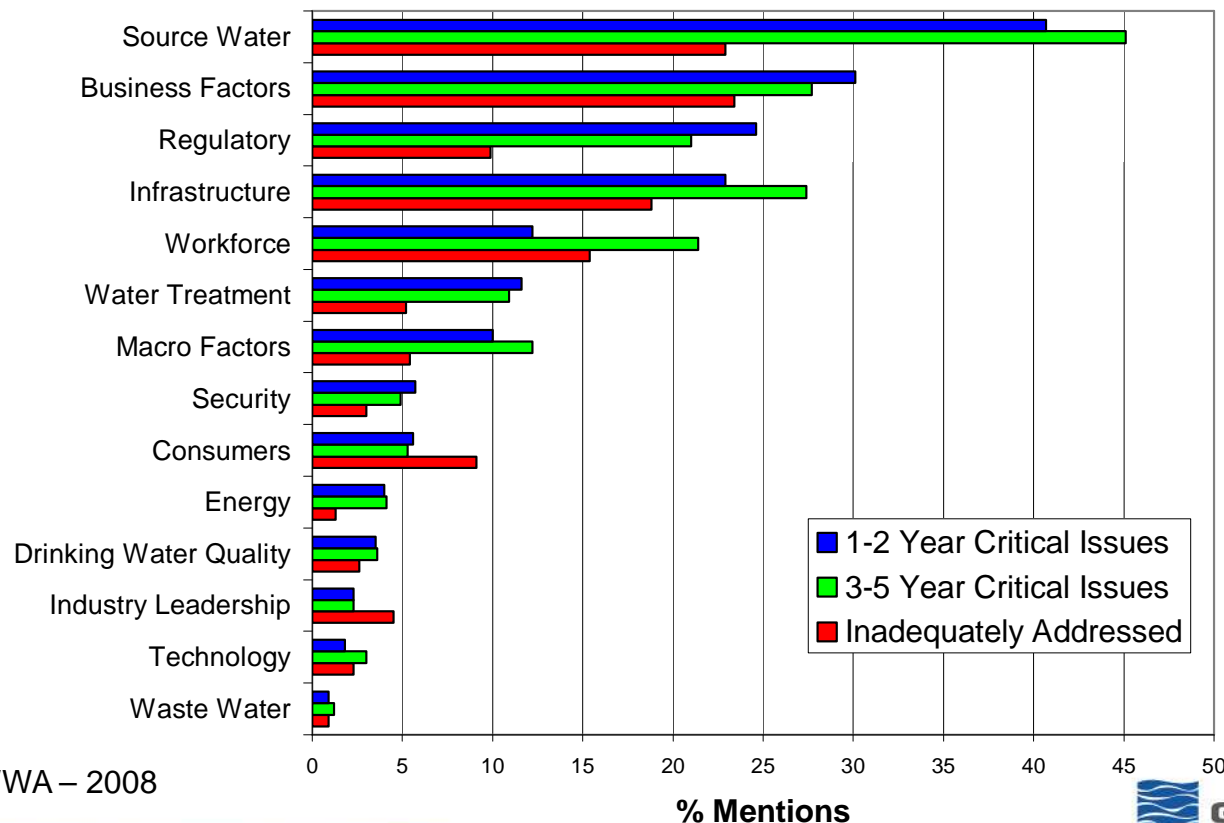
Perceptions of current U.S. water industry soundness have remained about the same over the past three years. However, there was a dramatic drop in future confidence, and for the first time future confidence is lower than impressions of current soundness. Current Soundness ratings have fallen about 0.17 points since 2004, but Future Soundness ratings dropped 0.46 points during that same period.



Source: AWWA – 2008

2008 Issues Summary – U.S.

Source Water Issues soured to the #1 issue Near Term, Longer Term and Most Inadequately Addressed. Business Factors and Infrastructure continue to be important and inadequately addressed as well. Source Water, Infrastructure and Workforce issues in particular are thought even more concerning longer term.



Top 2008 Issues

- Source Water Supply
 - Water Supply / Shortage
 - Source Water Protection
 - Drugs In Source Water
- Business Factors
 - Financing Repairs / Replacements / Upgrades
 - Rates / Cost Imbalance
 - Finance Regulatory Compliance
- Regulatory Factors
 - Complying with New Regulations
- Infrastructure
 - Aging Infrastructure
 - Failing Infrastructure
- Workforce
 - Lack of Qualified Workers / Salary / Prestige
 - Aging Workforce / Loss of Industry Knowledge

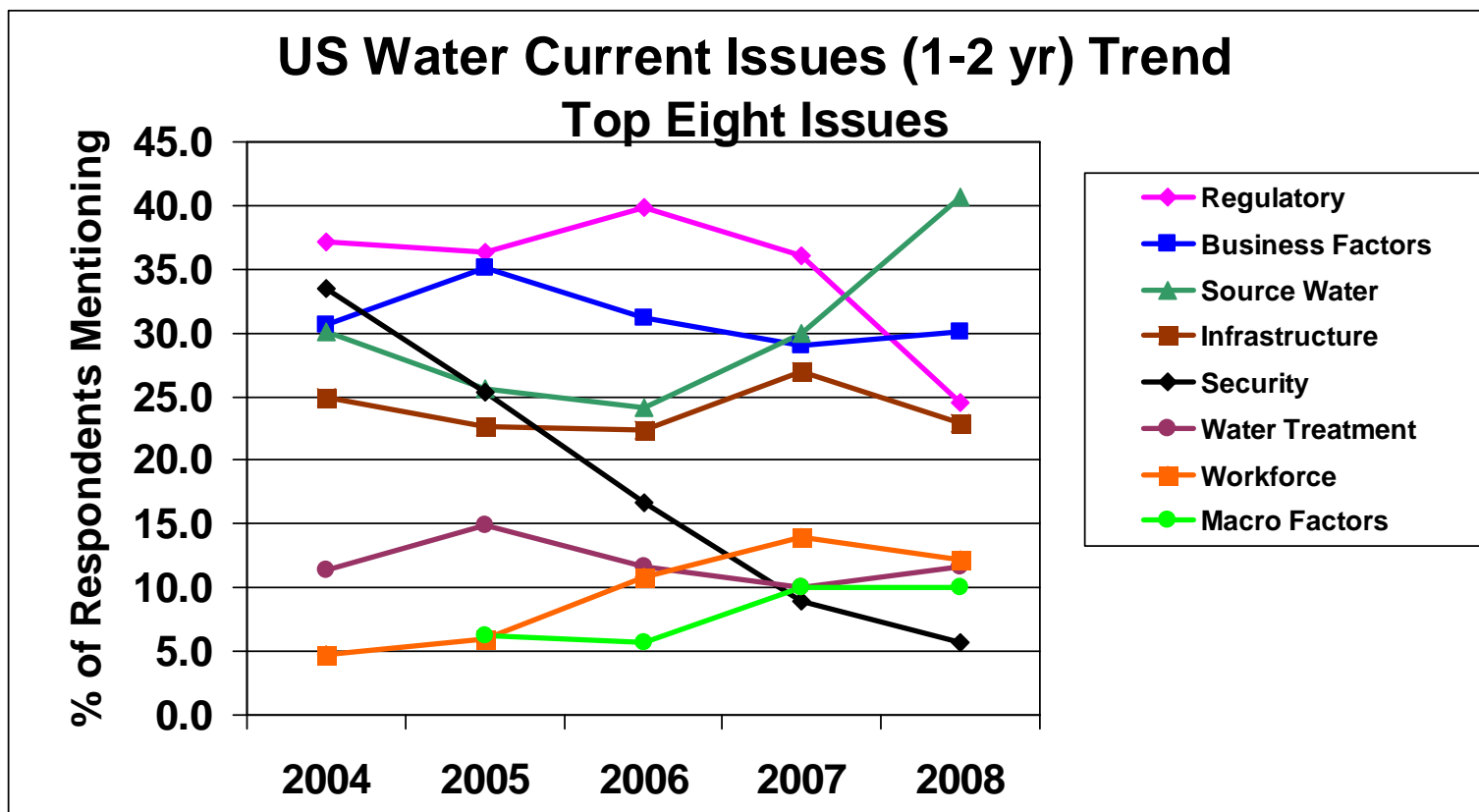
Source: AWWA – 2008



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U.S. Water Trends

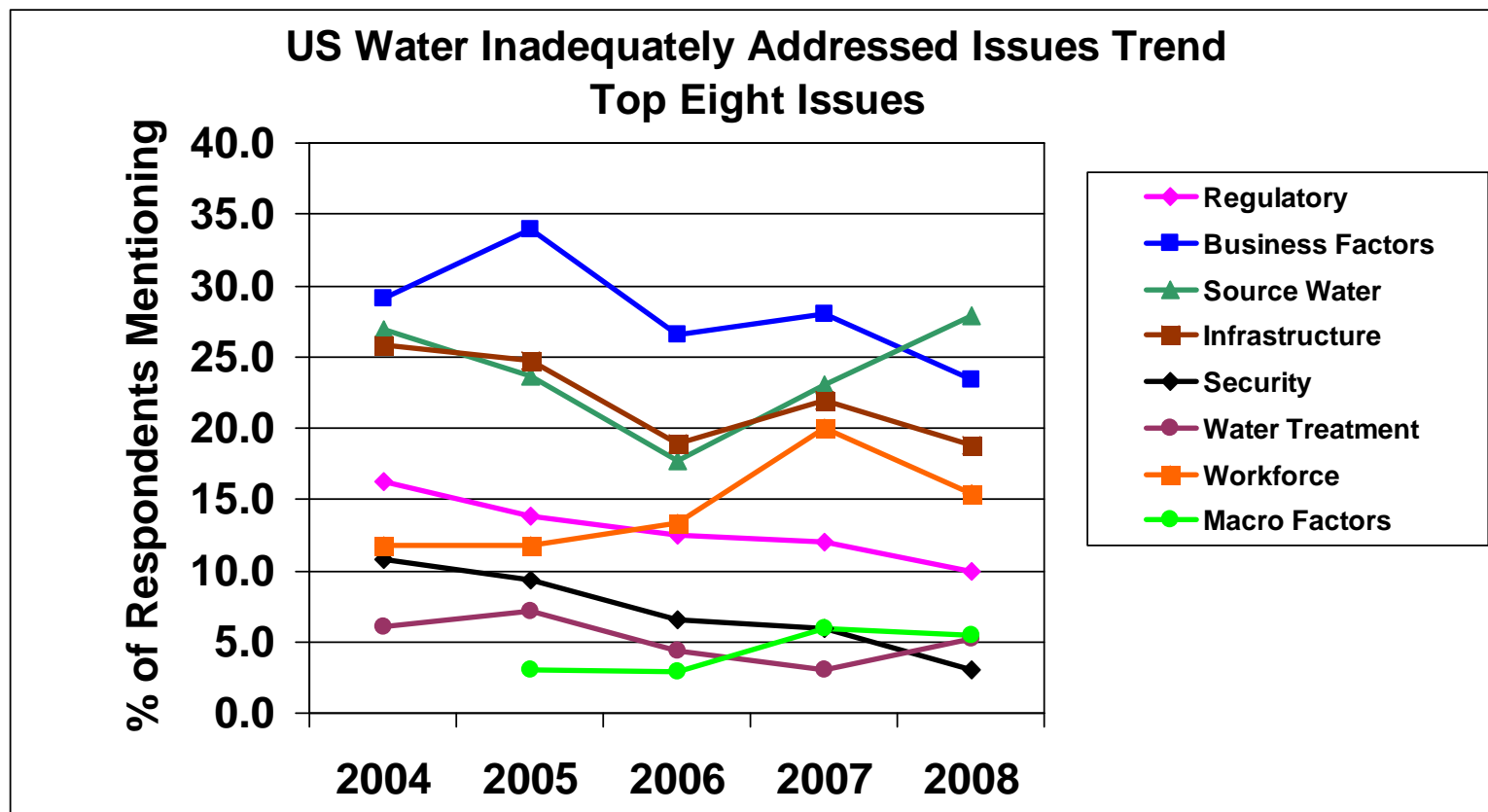
In the U.S., near-term Source Water and Infrastructure issues soared in 2007, with Workforce issues continuing their steep ascent since 2005. Macro Factors (growth, climate, environmental activism) grew, while Security issues continued their steady decline.



Source: AWWA – 2008

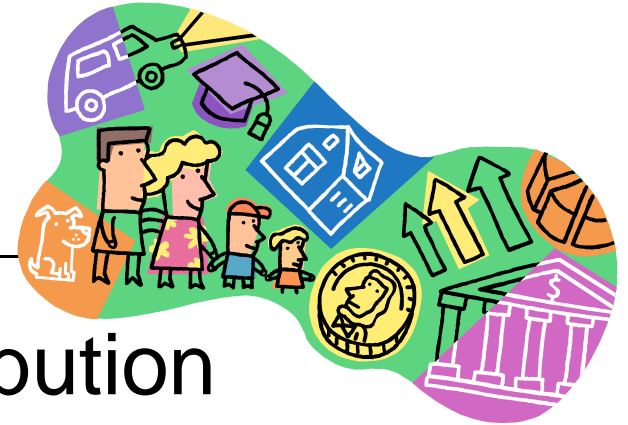
U.S. Water Trends *(continued)*

Business factors (especially funding/rates) remain the most inadequately addressed issues. Source Water, Infrastructure and Workforce Issues were up sharply. Regulatory issues, though critical, are viewed as relatively well addressed, as in past years.



Source: AWWA – 2008

Summary SOTI Survey



- The Aging Storage and Distribution Infrastructure Is Increasingly Problematic, and Requires Significant Investment
- Future Source of Supply Worries Are Increasing as Populations Grow and Source Water Protection Becomes More Difficult
- All of the Key Issues Above Have Significant Capital Needs – Raising Concerns About the Ability to Meet These Capital Needs

Our Nation's Nutrient Challenge



What is Being Done to Develop Sustainable Water Supply Planning Strategies

- Conservation
- Reuse
- Desalinization
- Groundwater
- Stormwater
- Water Transfer/Marketing
- Conjunctive Use
- Surface Water Imports
- Land Use Planning

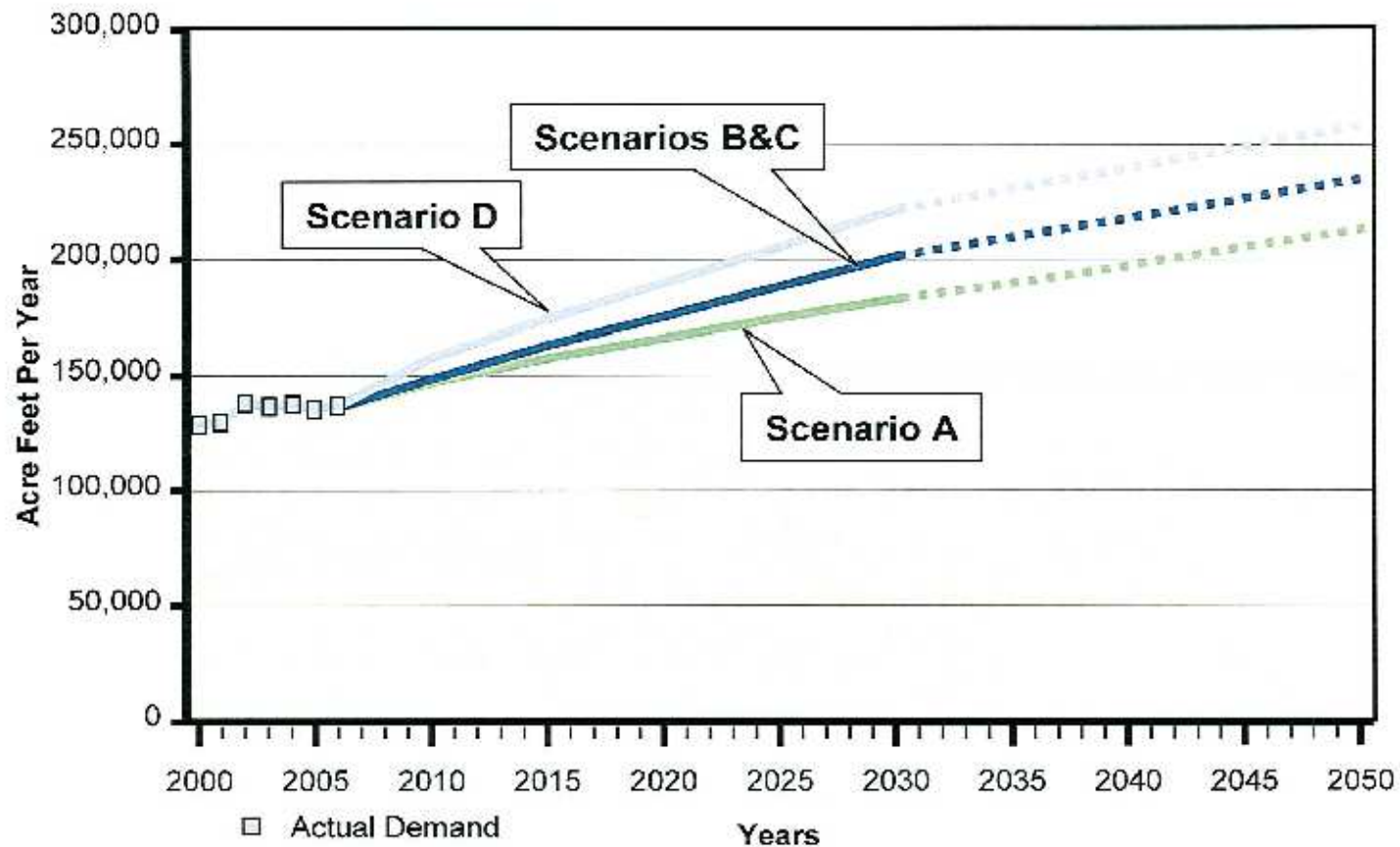


Integrated Resources Plan

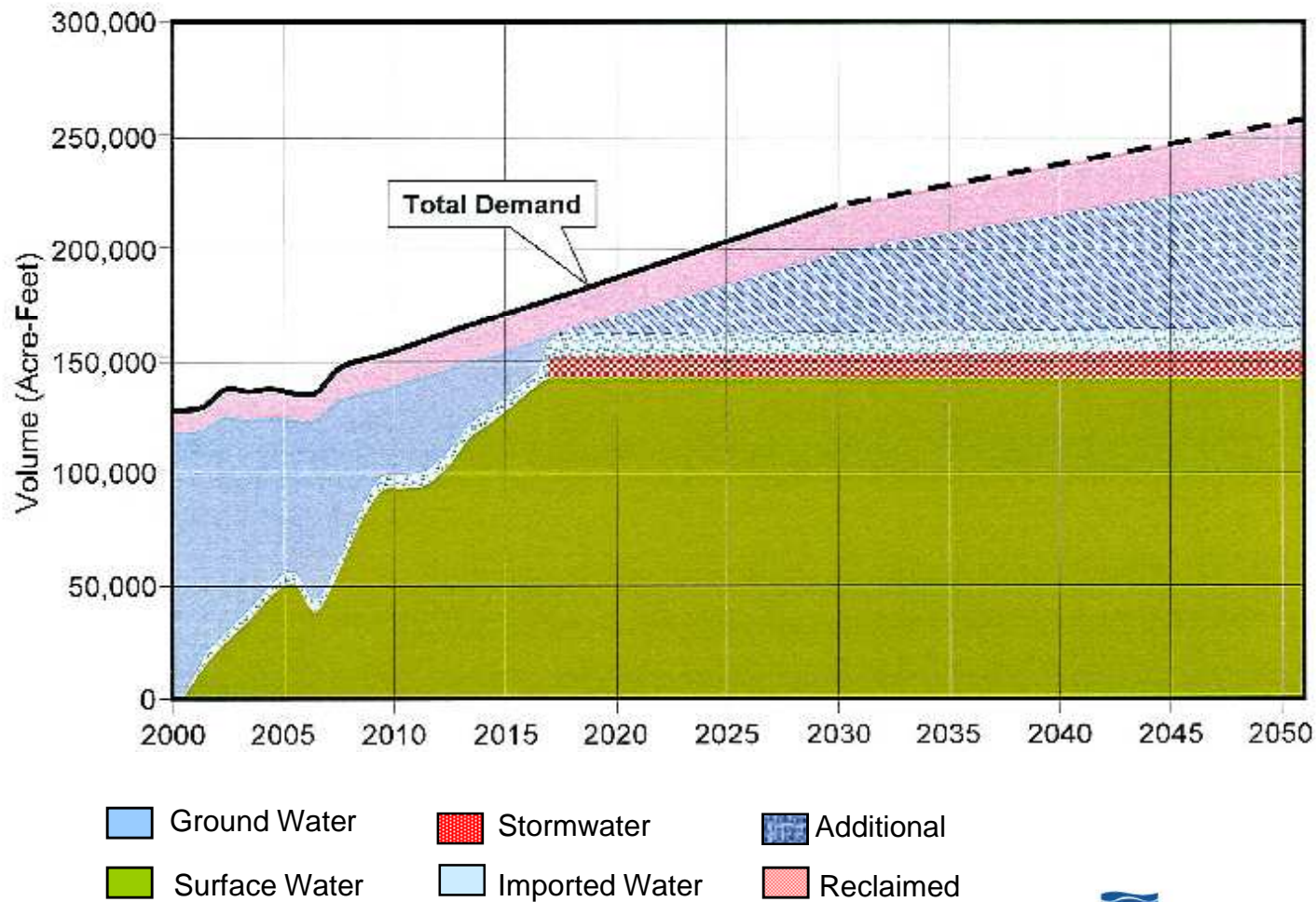
- Take a Fresh Perspective for Sustainable Water Resources Planning
- Link Wastewater, Stormwater and Water Supply Planning Using a Holistic Watershed Approach
- Incorporate Public Stakeholders at All Levels of Planning Process (Proactive Participation)
- Look for Collaboration With Others in the Total Watershed or Basin



Projected Demand Scenarios



Projected Demand and Water Resource Utilization

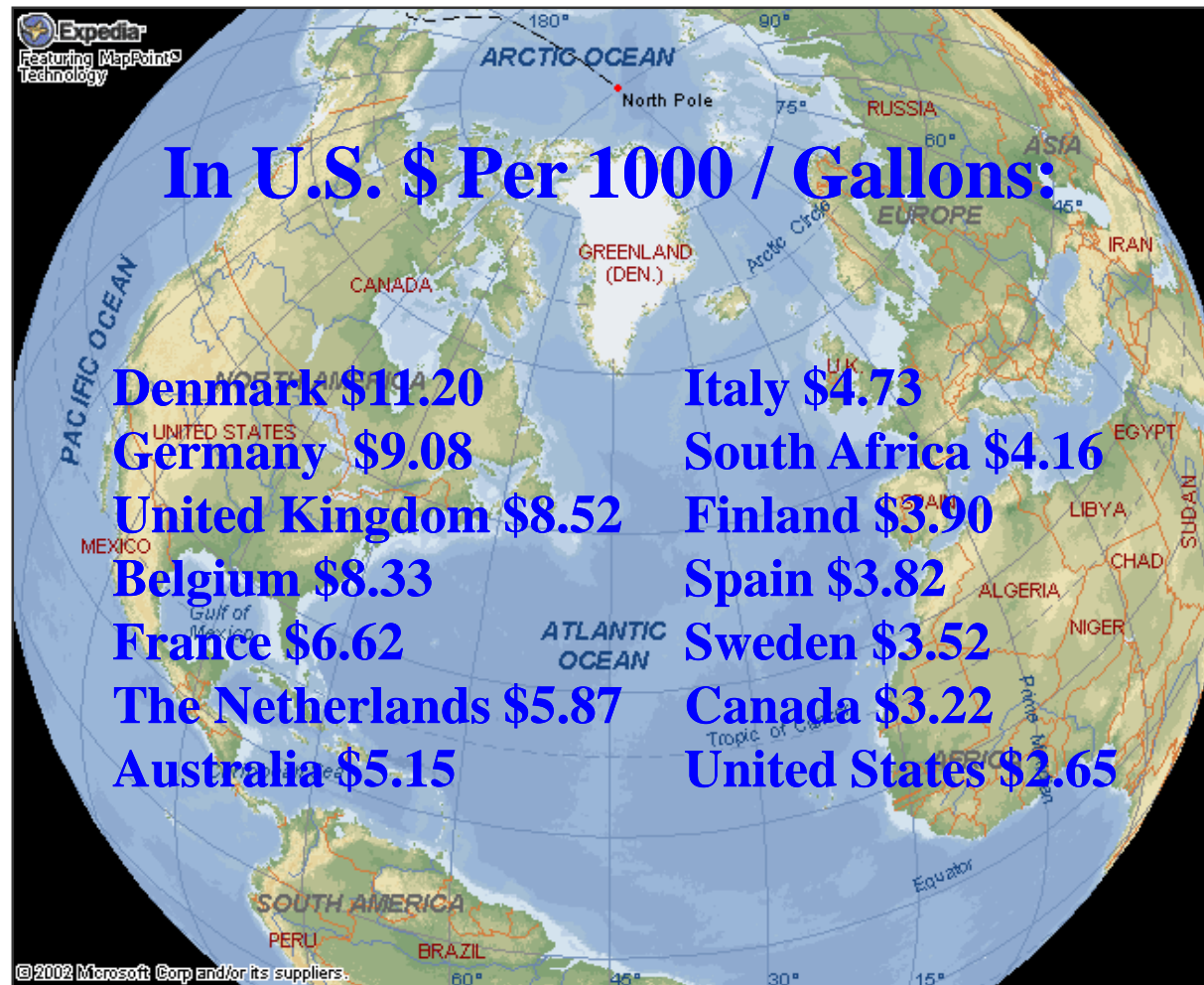


Value Is NOT the Same as Cost or Price

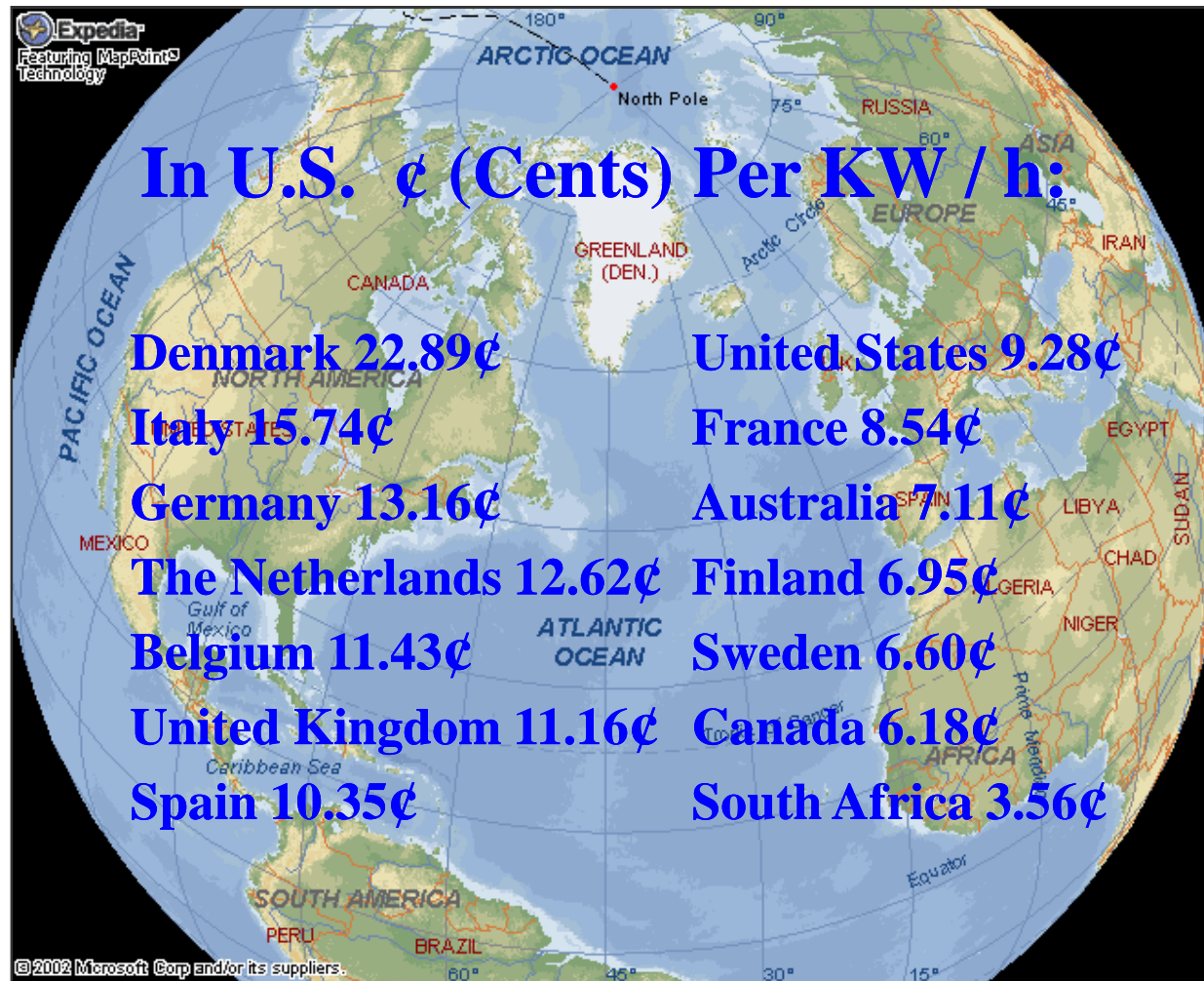
- The “Goods” – the End Products
 - Tap Water for the Customer (Safe, High Quality)
 - Clean Rivers (Suitable Quality Effluent Discharge)
- The “Services” Provided
 - Reliable Delivery of Ample Quantities of Safe and Aesthetically Pleasing Water to the Tap
 - Reliable Collection, Treatment, and Discharge of Environmentally Suitable Wastewater and Biosolids
 - Stewardship of Source and Receiving Waters, and of the Greater Good of the Community



Average Water Price



Average Electricity Price



Source: NUS Consulting Group- 2007

Trends – Impact on Sustainable Water Planning Strategies

- Social
 - People Greater and Greater Force – Need to Understand Value
 - Demographics / Population Growth Support
 - Balance Between Environment (Green) and Basic Need for Life
- Economic
 - Accurate Water/Wastewater Rate Models for Price Increases
 - Decisions About Water – Greater Significance – Main Driver
 - Supply Augmentation at What Cost? Vs Holistic Approach



Reached

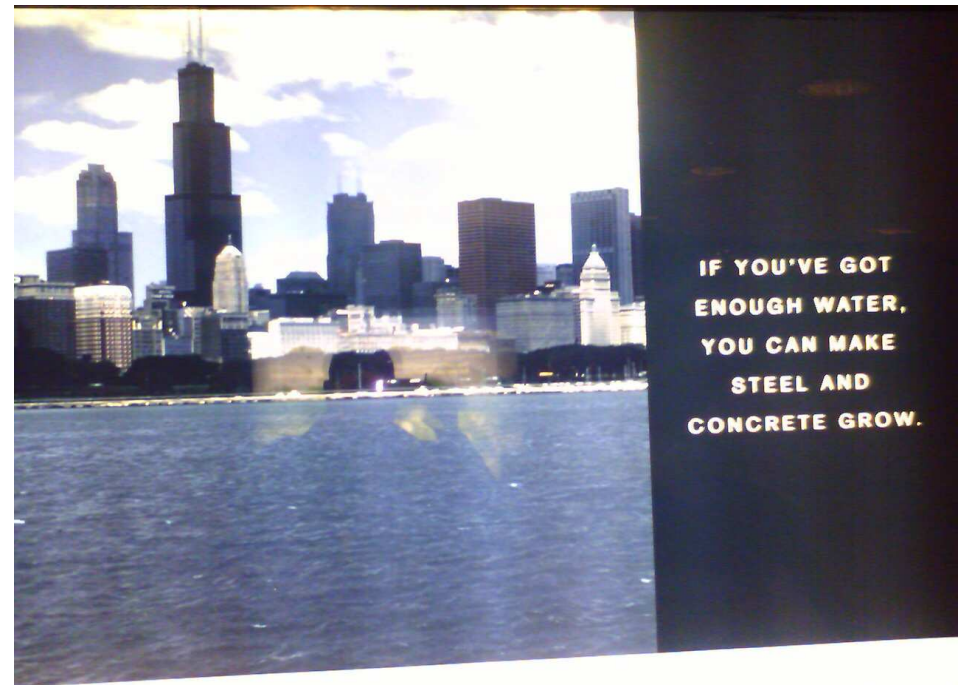
a National Policy Dialogue May Be Required

- National Policy Discussion Points:
 - Should the Nation's Water Issues Be Addressed In an Integrated Manner at Watershed and Basin Levels?
 - Should the Myriad of Laws, Executive Orders and Congressional Guidance Be Reconciled That Have Created a Disjointed, Ad-Hoc National Water Policy to a Policy That Clearly Defines Our 21st Century Goals?
 - Recognize the Fiscal Realities Facing the Nation; Is There a Need to More Effectively Coordinate the Actions of Federal, State, Tribal and Local Governments In Dealing With Water?
 - The Nation Is Blessed With Access to Superb Scientific Capabilities and Cutting Edge Information Technologies That Can Support Water-Related Decision Making; Are They Being Accessed / Used Effectively?



Summary

- Water Is the Gift of Life
- The 21st Century Is the Water Century
- Water Policies Will Continue to be Local – With Some Greater Regional and Even Interstate Collaboration, Unless There is a National Policy Dialogue
- In the Future We May Be Paying the Economical Value of Water Not Just



**“When the Well’s Dry,
We Know the Worth of Water.”**

Benjamin Franklin
Poor Richard’s Almanac

