GLOBAL WATER
RELIABLE • RENEWABLE • REUSABLE
Water Resources Research Center Annual Conference

Emerging Policy Challenges

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Global Water Resources
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Outline

• **Emerging Policy Challenges**
  • Scarcity Management
    • Scarcity - A worsening problem?
  • Water Reclamation and Reuse
    • Philosophies and Practices.
  • Eliminating Barriers
    • Perception; and,
    • Code simplification.
  • Align Quantitative & Economic Incentives for:
    • Private Utilities;
    • Public Utilities; and,
    • Development Community
Scarcity Management

- Growth in the state is continuing
- Despite the “slow-down” growth continues in outlying areas
- These areas have two things in common:
Scarcity Management

- Areas entirely controlled by small undercapitalized municipalities

Or

- Small undercapitalized private water companies
These types of Entities

- Generally lack the following:
  - Money
  - Man-power
  - Water Knowledge
  - Scarcity Management Capabilities…
Water Scarcity Impacts Costs:
• Water and water rights are harder to come by
• Water quality standards are going up
• Water recycling is now essential
  • Dual plumbing costs more
    • “It costs more to use less”
  • Technologies are more expensive
  • Higher operating costs
• The increased costs of Water Scarcity
  • Historically per section
    • $7,000/home
  • Water Scarcity model
    • $10,000/home
Growth – 1,000 Homes/year

Growth & Capital Requirements

<table>
<thead>
<tr>
<th>Year</th>
<th>Homes</th>
<th>Cumulative CAPEX</th>
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<tbody>
<tr>
<td>2006</td>
<td>1,000</td>
<td>$20,000,000</td>
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<tr>
<td>2007</td>
<td>2,000</td>
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<td>2008</td>
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<td>2009</td>
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<td>2010</td>
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<tr>
<td>2011</td>
<td>6,000</td>
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<tr>
<td>2012</td>
<td>7,000</td>
<td>$140,000,000</td>
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</tbody>
</table>

Legend:
- Red: Cumulative CAPEX
- Green: Bond Capacity
- Black: Homes
Growth – 2,500 Homes/year

Growth & Capital Requirements

- Cumulative CAPEX
- Bond Capacity
- Homes
Growth – 5,000 Homes/year

Growth & Capital Requirements

Cumulative CAPEX  Bond Capacity  Homes

Time

Homes

2006 2007 2008 2009 2010 2011 2012

$-  $200,000,000  $400,000,000  $600,000,000

$100,000,000  $300,000,000  $500,000,000

$600,000,000  $500,000,000  $400,000,000  $300,000,000  $200,000,000  $100,000,000  $-
Advanced Water Reclamation

Groundwater
- .16 acft/EDU
  - Gen Outside Uses
    - .12 acft/EDU
      - To Recharge or Evaporation
  - Gen Res Outside Uses
    - .04 acft/EDU
      - Outside Uses
        - .12 acft/EDU
          - To Recharge or Evaporation
      - Inside Uses
        - .16 acft/EDU
        - Toilet Flushing
          - .04 acft/EDU
        - All Other Uses
          - .12 acft/EDU
            - To Treatment
              - .16 acft/EDU

Groundwater
- .24 acft/EDU
  - Residential Uses
    - .24 acft/EDU

Toilet Flushing
- .04 acft/EDU
  - All Other Uses
    - .12 acft/EDU
      - To Treatment
        - .16 acft/EDU
The Power of Reclamation

Reclaimed Water
Surface Water
Ground Water

Scenario

acft/dwelling unit

Scenario
1
2
3
4

0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
Global Water Center
Global Water Center
Global Water Center

Daily Projected Water Savings Through Recycling in this Building

- Conventionally Plumbed Building
- Recycled Water Plumbed Building

<table>
<thead>
<tr>
<th>Gallons per Day</th>
<th>Daily Potable Water Use</th>
<th>Daily Recycled Water Use</th>
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Private Capital

- **Patient Equity**

- **The Funny Paradox**
  - While municipalities struggle to raise capital due to their roof-top oriented bond capacity, which by definition is rearward looking…
  - The water sector has never been hotter.
    - The world is awash in risk capital
    - There is not enough deal-flow to meet the demand for securities
  - Equity by definition is forward looking
Eliminating Barriers

- Leadership
- Outreach
- Frank dialogue on Scarcity Management
- Making it easy
  - Code
  - Support
- Making it mandatory
Aligning the Economics

• Historically – the Arizona Corporation Commission has defined the public interest as “lowest rates”
• In the new paradigm the new public interest is “scarcity management”
• This means the old precepts of:
  - used and useful
  - no recovery on acquisition of renewable rights
  - disincentives for designations
  - no incentives for reuse
• …need to give way to:
  - regional planning
  - conservation and recharge incentives
  - broad spectrum support and implementation of reclamation and reuse
  - financial incentives for reducing water demand in private utilities.
Conclusions

• Growth will continue – in some cases hyper-growth
• Infrastructure provision is getting more expensive and complex in the face of water scarcity
• Infrastructure for Cities is more costly and time-consuming to deploy by definition
• Scarcity Management is critical to achieve the State’s interest in sustainable economic development
• Partnership’s will be critical
• Private sector will play a very significant role
• New policies must define how utility infrastructure will conserve the state’s water resources