Defining A Resilient Business Model for Water Utilities
Webinar Outline

• Background
• Major takeaways
• Detailed findings
• Project resources
• Questions and answers
Audience Poll: Is there a new normal for your utility? If so, what is it?

- No new normal – business as usual
- Changing climate
- Declining consumption
- Looming capital deficit
- Some or all of the above....and more
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- Amber Halloran, Louisville Water Company
- Scott Haskins, CH2M Hill
- Myron Olstein, Independent Consultant
## Revenue Resiliency: Trends – Factors - Strategies

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Focus on Revenues and Rates

External Features: Constraints, Opportunities, Responsibilities, and Demands

Internal Policy Choices

Revenues

Financial Condition

Spending Pressures (and obligations)

Pricing and Rates

Spending
Not shown on map: fewer than 25 utilities in Alaska and Hawaii. Data on rates, revenues and financial performance of subsamples of 7,316 water and wastewater utilities across the United States and Canada were obtained from several national and regional data sets and merged by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data for some utilities were not analyzed depending on time period and focus of the analyses. Partner utilities are utilities that provided additional data, guidance, and feedback to the researchers throughout the project.
Monitoring Trends

Sample data sources

- National Pricing Data from EFC and RFC and other professional organizations
- National data on financial health metrics and revenue (rating agencies) for large systems
- State level data on financial health metrics and revenue for smaller systems (State Agencies)
- Utility level data from audit reports and billing systems
Project Resources

**REPORT**

Defining a Resilient Business Model for Water Utilities

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**TOOLS**

Water Utility Revenue Risk Assessment Tool

*How Much Revenue Might Be Lost When Residential Customers Reduce Consumption?*

Developed by: The Environmental Finance Center
Developed for: Water Research Foundation

This tool allows utilities and technical assistance providers to quickly determine the proportion of residential revenues from water sales that may be at risk of loss when residential customers change demand patterns. When residential customers reduce demand, whether due to price elasticity effects, or normal weather fluctuations that affect their water demands, or in reaction to shocks (such as new water conservation programs, water shortage periods, change in economic conditions, etc.), utilities collect less revenue from customer sales than anticipated. Utilities often ask how much of their revenues are really and realistically at risk of loss if their customers lower their consumption. This tool allows utilities and their technical assistance providers to quickly determine these estimates based on the utility's own rate structure, customer demand profile and weather conditions.

The tool requires only minimal data input and uses simplifying assumptions as well as detailed models developed after analyzing hundreds of thousands of real customer water records to understand how water customers change demand patterns.

This simplified tool is focused solely on revenue projections and assessment. Costs and revenue requirements based on customer classifications are not incorporated into this model. The tool allows the user to compare two different rate structures and determine which rate structure offers greater revenue resiliency.

**SLIDES**

Revenue Trends, Pricing Signals, and Financially Resilient Utilities: Understanding and Adapting to New Challenges

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**BLOG POSTS**

Determining the Financial Health of a Water Utility

EPA

Visit the EPA website for more information on resources related to water utilities.

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Subject Area: Management and Customer Relations
Key Findings

Business model is not completely broken, but...

• The past five years have been trying ones for the industry

• In order to raise sufficient and predictable revenues in the future, utilities must move beyond the approach of small rate modifications and...
Key Recommendations

• Understand their business risk for disruptive revenue fluctuations
• Adopt basic policies and performance targets to drive financial decisions
• Re-examine sales projection methodologies
• Consider the repercussions of the message that customers are buying gallons of water when the cost side of the business model suggests they are buying access to water
• Consider new pricing models
# Revenue Resiliency: Trends – Factors - Strategies

## ASSESSING THE REVENUE RESILIENCE OF THE INDUSTRY’S BUSINESS MODEL
- Trends in Financial Performance
  - Operating Revenues
  - Operating Expenses
  - Debt
- Pricing Trends and Financial Resilience

## FACTORS INFLUENCING REVENUE RESILIENCE
- Service Area Size and Diversity
- Water Use and Weather
- Economic Conditions
- Capacity Utilization
- Economic Regulation and Governance
- Financial Management Strategies
- Credit Rating Agencies

## STRATEGIES AND PRACTICES FOR REVENUE RESILIENCY
- Demand Projections
- Alternative Rate Designs
- Rate Stabilization Reserves
- Rethinking Utility Services
- Financial Performance Targets
- Customer Affordability/Assistance Programs
- Rate Adjustment Approaches
ASSESSING THE REVENUE RESILIENCE OF THE INDUSTRY’S BUSINESS MODEL
Trends in Financial Performance:

Operating Revenues as Percent of Revenues

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: Moody's Water and Sewer Municipal Financial Ratio Analysis.

Total operating revenues as a percent of total revenues among 662 utilities nationwide in 2012
Trends in Financial Performance:
Customer Sales as a Percent of Operating Revenues

Revenues from customer sales as percent of total operating revenues in FY2011

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: FY2011 Income Statements and Comprehensive Annual Financial Reports. FY2010 data used where noted.
Trends in Financial Performance:
Commodity Charges as a Percent of Customer Sales

Layers of revenues and the proportion of revenues from commodity charges in two utilities

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: Income Statements and Comprehensive Annual Financial Reports, and data provided directly by the utilities.
**Audience Poll:** What percentage of your customer sales revenues come from commodity charges (volumetric rates)?

- 91-100%
- 75-90%
- 50-74%
- 30-49%
- < 30%
- Don’t know
Fixed versus variable costs and revenues for two utilities

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Sources: Alameda County Water District’s Financial Plan model and Austin Water’s FY2012 budget estimations in the Reference Material to the Joint Subcommittee on Resource Management Commission, Water & Wastewater Commission, and Impact Fee Advisory Committee.
Industry Revenue Growth Roller Coaster

Annual change in total operating revenues among the same 485 utilities nationwide

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: Moody's Water and Sewer Municipal Financial Ratio Analysis. The cohort of 485 utilities is consistent across all years.
Industry Revenue Growth Roller Coaster

Annual change in total operating revenues among the same 485 utilities nationwide

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: Moody's Water and Sewer Municipal Financial Ratio Analysis. The cohort of 485 utilities is consistent across all years.
Changing Revenues of 2,838 Utilities in 6 States

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Revenues are: total operating revenues in CA, GA, NC, WI; gross revenues in OH; revenues that can pay for debt service in TX. The sample of utilities in each state is consistent across all years (e.g.: the same 946 utilities in CA are analyzed every year). Data sources: California State Controller’s Office, Georgia Department of Community Affairs, North Carolina Local Government Commission, Ohio Water Development Agency, Texas Water Development Board, Wisconsin Public Service Commission.
Audience Poll: How did your total revenues change in the last 10 years?

• Steadily increased
• Increased every year but increases slowed during recession
• Stayed the same
• Increased some years and decreased in others
• Steadily decreased
• Don’t know
• Other
Are revenues keeping pace with O&M expenses?

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: Moody's Water and Sewer Municipal Financial Ratio Analysis. The cohort of 583 utilities is consistent across all years. Increases of operating revenues and O&M expenses within +/-1% are put in the "same rate" category.
Are revenues sufficient to cover O&M expenses?

Trends in non-capital operating ratios among a cohort of 1,236 utilities in OH, TX, and WI

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. The cohort of utilities in each state is consistent across all years. Data sources: Ohio Water Development Agency, Texas Water Development Board, Wisconsin Public Service Commission. Ratios are: gross revenues / O&M expenses in OH, revenues that can pay for debt / expenses that affect ability to pay for debt in TX, operating revenues / operating expenses excluding depreciation in WI.
Are revenues **sufficient** to cover expenses including depreciation?

Trends in operating ratios among a cohort of 1,596 utilities in CA, GA, and NC
Trends in Long-Term Debt

Long-term debt for 192 water and combined utilities from 2003-2012

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill. Data source: Moody’s rating agency. The same group of utilities is used each year, and only utilities with debt data available for all ten years were used.
**Audience Poll:** Are your revenues generally sufficient to pay for your expenses?

- Revenues not enough to pay for O&M expenses
- Revenues not enough to pay for O&M expenses plus capital costs (debt/cash, or depreciation)
- Revenues exceed O&M and capital costs, but not much left for building up reserves
- We are aggressively building up reserves from excess revenues
Trends in Rates

THE MAJOR LEVER: RATES
Trends in Rate Adjustments

Percent of utilities changing rates in five states (n=3,102 utilities)

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data sources: GEFA/EFC annual rate surveys (GA), NCLM/EFC annual rate surveys (NC), OH EPA annual rate surveys, TML annual rate surveys (TX), WI PSC data on utility rate structures. The sample of utilities varies across the years and reflect only the utilities that were surveyed in that year and the prior year.
Changing Rates for 1,961 Utilities in Six States

**Cumulative bill increases for 1,961 utilities in six states compared to CPI by region**

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Rates data for all utilities in this analysis were known for all consecutive years and the cohort of utilities is the same for all years. Inflation of the regional Consumer Price Index is shown for the region each state is located in: South for GA, NC, TX; West for CA; Midwest for OH, WI. Data sources: Annual and biennial statewide rates surveys conducted by Raftelis Financial Consultants (CA), Georgia Environmental Finance Authority/Environmental Finance Center, North Carolina League of Municipalities/Environmental Finance Center, Ohio EPA, Texas Municipal League, and Wisconsin Public Service Commission; Regional Consumer Price Indices by the U.S. Bureau of Labor Statistics.
Trends in Rates and Revenues

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: The national biennial AWWA-RFC Water and Wastewater Rate Surveys. The sample of utilities varies every two years and reflects only the utilities that were surveyed in both years.

Biennial rate modifications nationwide, 2000-2012 (n=329 utilities)
Audience Poll: How often do you usually change rates?

- At least every year
- Every couple of years, on average
- Every 3-5 years
- We usually maintain rates for more than 5 years
- Don’t know
Frequency and Degree of Rate Changes

Average annual rate adjustment ($) by frequency of raising rates (n=1,966 utilities)

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Rate change data were known for five consecutive years for all utilities in the cohorts of each state. Data sources: Annual rates surveys conducted by GEFA/EFC (2008-2012), NCLM/EFC (2009-2013), OH EPA (2006-2010), TX Municipal League (2008-2012), and the Wisconsin Public Service Commission (2008-2012).

Average rate adjustment by frequency of raising rates (n=1,966 utilities)
Frequency and Cumulative Degree of Rate Changes

Average 5-year cumulative rate increase by frequency of rate adjustments (n=1,966 utilities)

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Rate change data were known for five consecutive years for all utilities in the cohorts of each state. Data sources: Annual rates surveys conducted by GEFA/EFC (2008-2012), NCLM/EFC (2009-2013), OH EPA (2006-2010), TX Municipal League (2008-2012), and the Wisconsin Public Service Commission (2008-2012).
Rate Adjustments by Volume

Median monthly water bill by level of consumption (n=58)

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: The national biennial AWWA-RFC Water and Wastewater Rate Surveys. The cohort of 58 utilities were consistent across all years.
Fixed Versus Variable Rates

Base Charge Portion of the Residential Water Monthly Bill for 5,000 Gallons in 2007 and 2012 for 1,260 utilities in Georgia, North Carolina, and Wisconsin

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data sources: NCLM/EFC annual rate surveys, GEFA/EFC annual rate surveys, rate structure data for utilities by the Public Service Commission of Wisconsin. Data reflect base charge portion of residential water bill at 5,000 gallons in 2007 and in 2012.

Base (fixed) charge portion of the residential water bill for 5,000 gallons/month in 2007 and 2012 for 1,260 utilities in Georgia, North Carolina, and Wisconsin
Audience Poll: Did you recently change the ratio of your base charges and volumetric charges?

• We increased the base charge proportion of the average bill
• We increased the volumetric charge proportion of the average bill
• We changed rates, but the proportions stayed the same
• Don’t know/Can’t tell
• We didn’t change rates recently
Are revenue increases keeping pace with rate increases?

“In all three states, 61%-66% of the utilities had lower revenue increases than rate increases (points below the 1:1 line), and almost every utility that raised rates by more than 50% had relatively lower revenue increases. “

Graphs show increases in rates and revenues among 566 utilities in three states.
FACTORS INFLUENCING REVENUE RESILIENCY
Factors Influencing Revenue Resiliency

• Service Area Size and Diversity
• Water Use and Weather
• Economic Conditions
• Capacity Utilization
• Economic Regulation and Governance
• Financial Management Strategies
• Credit Rating Agencies
## Service Area Size and Diversity

### Table 3.1
Utility financial performance in FY2012 among 382 local government utilities in North Carolina, by utility size

<table>
<thead>
<tr>
<th>Number of service connections</th>
<th>Number of utilities</th>
<th>Operating revenues insufficient to cover operations and maintenance expenses</th>
<th>Operating revenues insufficient to cover operations and maintenance expenses plus debt service</th>
<th>Operating revenues sufficient to cover debt service and operations and maintenance expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-999</td>
<td>162</td>
<td>17%</td>
<td>17%</td>
<td>66%</td>
</tr>
<tr>
<td>1,000 – 9,999</td>
<td>172</td>
<td>5%</td>
<td>21%</td>
<td>74%</td>
</tr>
<tr>
<td>10,000+</td>
<td>48</td>
<td>0%</td>
<td>8%</td>
<td>92%</td>
</tr>
</tbody>
</table>

*Source: Adapted from (Eskaf et al. 2013)*

### Table 3.2
Median water and wastewater monthly bills in North Carolina in 2013, by utility size

<table>
<thead>
<tr>
<th>Number of accounts</th>
<th>Number of water rate structures</th>
<th>Median water bill for 5,000 gallons/month</th>
<th>Number of wastewater rate structures</th>
<th>Median wastewater bill for 5,000 gallons/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 999</td>
<td>117</td>
<td>$29.35</td>
<td>98</td>
<td>$38.83</td>
</tr>
<tr>
<td>1,000 – 2,499</td>
<td>90</td>
<td>$30.48</td>
<td>80</td>
<td>$36.80</td>
</tr>
<tr>
<td>2,500 - 4,999</td>
<td>81</td>
<td>$30.29</td>
<td>77</td>
<td>$34.58</td>
</tr>
<tr>
<td>5,000 – 9,999</td>
<td>75</td>
<td>$27.05</td>
<td>55</td>
<td>$35.00</td>
</tr>
<tr>
<td>10,000 – 24,999</td>
<td>76</td>
<td>$28.60</td>
<td>55</td>
<td>$31.80</td>
</tr>
<tr>
<td>25,000+</td>
<td>72</td>
<td>$26.30</td>
<td>57</td>
<td>$34.81</td>
</tr>
</tbody>
</table>

*Source: Adapted from (Eskaf et al. 2013)*
Water Use is Declining for Many Utilities

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: Biennial, national AWWA-RFC Water and Wastewater Rate Surveys in 2006 and 2012. Water utilities that reported their total daily gallons sold (MGD) in 2006 and 2012 are included in this analysis. 81% of the sampled utilities increased total number of accounts from 2006 to 2012.

MGD sales in 2012 compared to 2006 among 129 utilities nationwide
Water Use and Weather: One Utility’s Experience

Figure 3. OWASA Water Sales, FY 1980-2009

Average Annual Increase
1980-2002: 0.195 mgd/year
2003-2009: -0.044 mgd/year
...and another’s

Newport News Waterworks’ Drop in Demand

29 MGD
## Economic Conditions

### Average trends in median increases to operating revenues in cohorts of utilities in six states

<table>
<thead>
<tr>
<th>Fiscal Year:</th>
<th>‘01</th>
<th>‘02</th>
<th>‘03</th>
<th>‘04</th>
<th>‘05</th>
<th>‘06</th>
<th>‘07</th>
<th>‘08</th>
<th>‘09</th>
<th>‘10</th>
<th>‘11</th>
<th>‘12</th>
</tr>
</thead>
<tbody>
<tr>
<td>California (n=946)</td>
<td></td>
<td></td>
<td>4.5%/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.2%/year</td>
<td></td>
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<tr>
<td>Georgia (n=333)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.2%</td>
<td></td>
<td>0.1%/year</td>
<td></td>
<td>3.9%/year</td>
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</tr>
<tr>
<td>North Carolina (n=306)</td>
<td></td>
<td></td>
<td>3.6%/year</td>
<td></td>
<td></td>
<td></td>
<td>5.7%/year</td>
<td></td>
<td></td>
<td>2.8%/year</td>
<td></td>
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<tr>
<td>Ohio (n=400)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2%/year</td>
<td></td>
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<tr>
<td>Texas (n=286)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.7%/year</td>
<td></td>
<td>2.1%/year</td>
<td></td>
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<tr>
<td>Wisconsin (n=567)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.1%/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.8%/year</td>
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Economic Conditions

Comparison of the cost of water as a percent of median household income and as percent of poverty threshold.

Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data sources: 2004 and 2012 AWWA-RFC Water & Wastewater Rates Surveys; U.S. Census Bureau. Monthly residential bill for water only at 10 ccf was multiplied by 12 to compute annual residential water bill using the low season (wintertime) rates. Annual bills are divided by the median household income of the service community as reported in the survey in that year, or by the U.S. Census Bureau-reported national weighted average poverty threshold for a family of three in 2004 ($15,067) and in 2012 ($18,287 - preliminary estimate).
Economic Regulation and Governance

- Municipal/County-owned utilities
- Independent authorities and districts
- Private investor-owned companies
- Government-owned utilities regulated by utilities commission
- Other types of economic regulation and oversight
Credit Rating Agencies

Key credit rating considerations of S&P for 18 drinking water utilities from 2010-2012
Credit Rating Agencies

- “Denver Water’s debt guidelines state the organization’s desire to maintain the standalone revenue bond rating at a level of AA or better.” (Denver Water 2012)
- Objective A: Maintain AAA 7-year financial goals and meet appropriated designated fund level goals.” (Mesa Water 2011)
- Credit rating is one of the performance measures tracked by the Office of the General Manager at the Metropolitan Water District of Southern California. The intent of the measurement is to “enable Metropolitan to access capital markets at the lowest borrowing cost.” The target is set at AA, Aa2 or better. (Metropolitan Water District of Southern California 2010)
- “Maintain WaterOne’s current Bond ratings for senior debt of AAA from S&P and Aaa from Moody’s.” (Water District No. 1 of Johnson County 2012)
- The [Clayton County Water] Authority’s primary objectives [of its debt policies] are to minimize debt service and issuance costs; maintain access to cost-effective borrowing; achieve the highest practical credit rating; ensure full and timely repayment of debt; maintain full and complete financial disclosure and reporting; and ensure compliance with applicable state and federal laws.” (Clayton County Water Authority 2011)
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Learn more

• **Webinar on Strategies and Practices for Revenue Resiliency**
  Thursday, February 13th
  3pm-4:30 Eastern

• **Environmental Finance Blog**

• **Tools**
  – Customer Assistance Program Cost Estimation Tool
  – Revenue Risk Assessment Tool

• **Report** – Defining a Resilient Business Model for Water Utilities - 4366
Questions?

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