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Testing the Water: Smart Metering for Water Utilities

January 2010

Contents

"There is no resource more precious than water. There is also no resource that is misused, abused, misallocated, and misunderstood the way water is.*"

*Source: Plant Green, How to Go Green: Water, http://planetgreen.discovery.com/go-green/green-water/green-water-basics.html

Did You Know?

- At least 36 states are projecting water shortages between now and 2013
- Each American uses an average of 100 gallons of water a day at home
- Approximately 5-10% of American homes have water leaks that drip away 90 gallons a day or more, due to old fixtures like leaky toilets and faucets. If the 5% of American homes that leak the most corrected those leaks – it could save more than 177 billion gallons of water annually

Testing the Water: Smart Metering for Water Utilities

"Smart grid" has received a lot of buzz in recent months – with electric utilities receiving most of the spotlight, launching initiatives that improve network reliability, enhance efficiency, and help drive more-informed consumption decisions.

But, electric utilities aren't the only ones facing aging infrastructures, sustainability challenges, and customer demand for better service. With growing pressure, water utilities in the United States and Canada will need a more intelligent approach to managing water consumption to meet environmental concerns.

So, why are electric utilities leading the movement to replace current consumption meters with "smart meters" and "smart grid" technology? Isn't it time for water utilities to dive into smart metering as well?

In late 2009, Oracle surveyed more than 300 water utility managers and 1,200 water consumers in the United States and Canada to examine:

- Water utility managers' perception of, and future plans for, smart meter technology, including benefits and potential obstacles
- Water consumers' perception of their water use, motivations for conservation, and what they feel they need from their water utilities moving forward

Smart Meter Technologies: A key component of smart grid; advanced two-way communication between the meter and the water utility that allows the utility to obtain interval meter reads on demand and issue commands to the meter for remote disconnects/reconnects

Executive Summary

- Consumers* care about water conservation and believe they can reduce personal water use. Many have taken steps to reduce their use in the past 12 months:
  - ✓ 76% of consumers are concerned about the need to conserve water in their community
  - ✓ 69% of consumers believe they could reduce their personal water use
- Water utility managers say they are committed to promoting water conservation and believe smart meter technology adoption is critical for the industry:
  - ✓ 73% of water utility managers say their utility actively promotes water conservation
  - ✓ 68% of water utility managers believe it is critical that water utilities adopt smart meter technologies
- However, they are in the early stages of smart meter adoption:
  - ✓ One-third are currently considering or implementing smart meter technologies
- Consumers believe receiving more detailed information on their water consumption will be a key factor in motivating their water conservation efforts:
  - ✓ 71% believe** having access to this data would encourage them to take steps to lower their water use

*Consumers in all cases refers to water utility consumers **Of those consumers who would or would consider accessing and reviewing online consumption data, N=934

Water Utilities on Smart Meter Technology

- 68% of water utility managers believe it is critical that water utilities adopt smart meter technologies

Top five benefits associated with smart meter technologies for water utilities*

#1	Enabling early leak detection (62%)
#2	Supplying customers with the tools to monitor/reduce their water use (35%)
#3	Providing more accurate water rates (24%)
#4	Curbing overall water demand (19%)
#5	Improving ability to conduct preventative maintenance (18%)

*Canadian water utilities are significantly more likely than U.S. water utilities to consider supplying customer information a top benefit – **46% to 24%** respectively*

83%

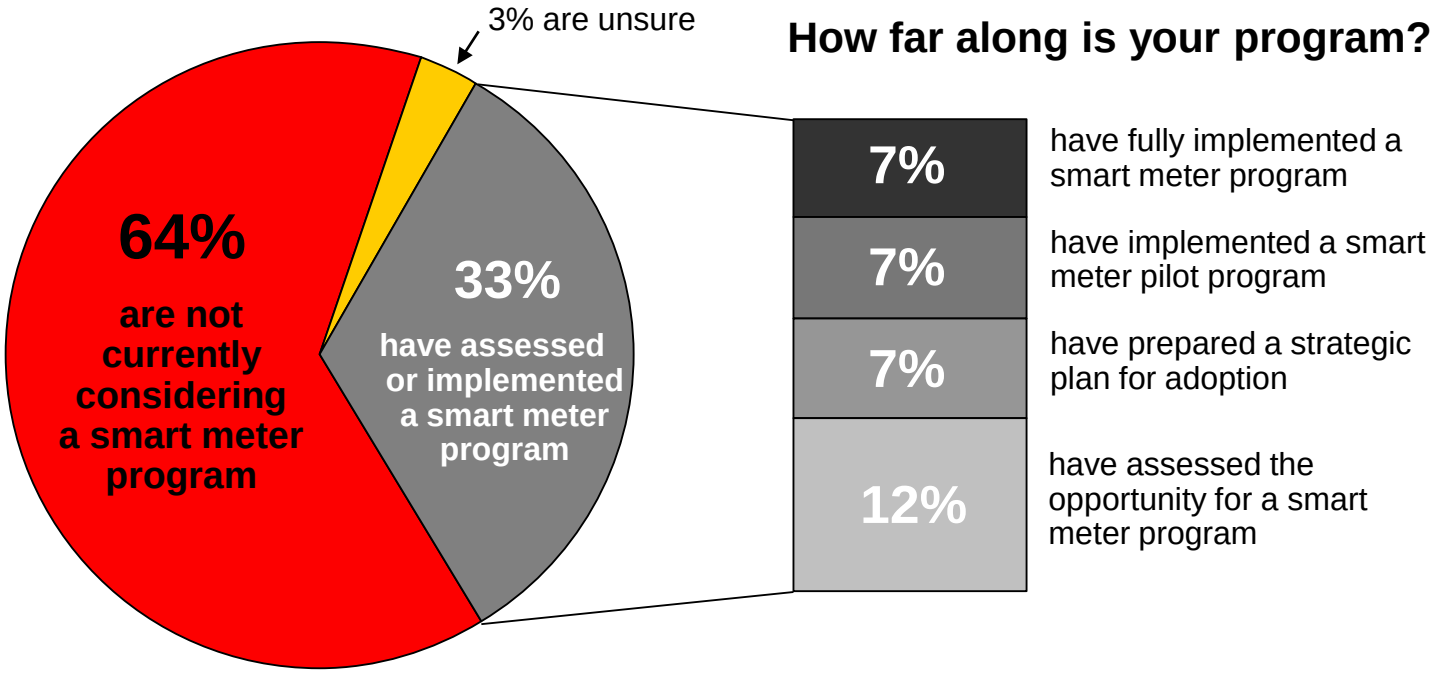
of water utilities who have completed a cost-benefit analysis support the adoption of smart meter technology**

Take Away: Strong Value Proposition

*Utility managers were asked to select top two most significant benefits **Of water utilities who have completed a cost-benefit analysis, N=86

State of the Industry

- One in three water utility organizations is currently considering or implementing smart meter technologies – a key component in smart grid programs



*Larger water utilities (100 employees or more) are more than twice as likely as smaller water utilities (less than 20 employees) to consider or implement smart meter technologies – **59% to 26%** respectively*

Take Away: Early Stages of Advancing Intelligent Water Systems

Early Adopters: Concerns and Motivations

- Water utilities moving forward with smart meter adoption are concerned with the cost of the technology, but are encouraged by long-term sustainability objectives

Those considering or implementing smart meter technologies:

Top Concerns*

75%	*Capital costs*
62%	*Operating costs*
56%	*Reliability of the technologies*
54%	*Incremental costs to customers*
50%	*Service quality*

*Those who are currently considering or implementing smart meter technologies were asked to select all that apply, N=100

Top Motivations**

32%	*Internal sustainability initiatives*
22%	*Alleviating pressure on a limited resource*
15%	*Regulatory requirements*
11%	*Customer demand*

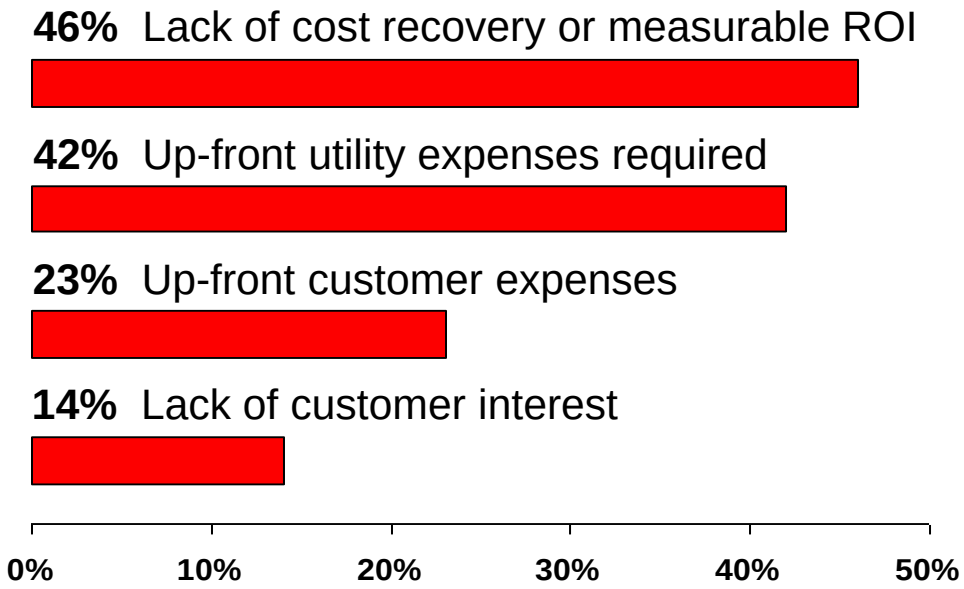
**Those who are currently considering or implementing smart meter technologies were asked to select their organization's top motivation, N=100

Take Away: Recognizing the Potential

Water Utility Roadblocks

- The water utilities industry as a whole shares similar concerns with the early adopters

All water utilities: In your opinion, what are the top roadblocks to implementing smart meter technologies?*



Canadian water utilities are significantly less concerned than U.S. water utilities about up-front utility expenses (34% to 51%) and significantly more concerned about the lack of government support (19% to 7%)

Take Away: Show Me the Money

*Water utility managers were asked to select the top two most significant roadblocks

Consumers Care

- Consumers are concerned about water issues and their personal consumption

76%

are concerned with the need to conserve water in their community

67%

are concerned with the water costs of their home

Both U.S. and Canadian consumers are more concerned with water conservation than water costs

Take Away: Conservation Outweighs Costs

Consumers Motivated to Act

- Two thirds (66%) of water consumers have taken steps in the past 12 months to lower their home's water use
- These respondents cite water conservation as the top reason for their water reduction

<u>Consumers who have taken steps</u>: Why have you taken steps to lower your water use?

#1 To conserve water (75%)

#2 To reduce the cost of my current water bill (59%)

*Water utility customers in the United States are significantly more likely than those in Canada to reduce water use in an effort to reduce the cost of their bill – **69% to 50%** respectively*

<u>All water consumers</u>: Which of the following would most incent you to reduce your excess water use?*

#1 Water utility incentive/rebate for reduced use (67%)

#2 State and/or Federal tax rebate for reduced use (61%)

#3 Water utility rebate program for use of smart water technologies (51%)

#4 Increased water costs (45%)

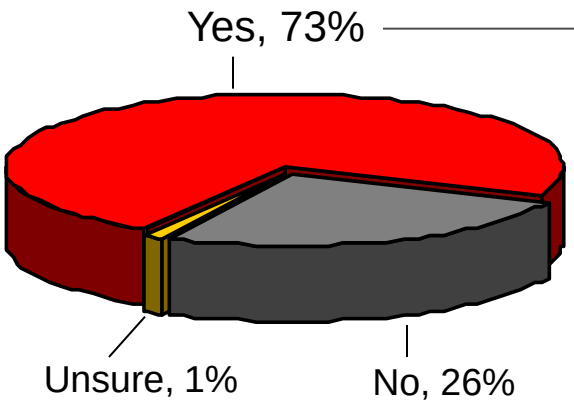
Take Away: Consumers Internally Motivated, but Incentives Would Help

*Percent of consumers who rated the tactic an eight to 10 on a scale of one to 10, where 10 is "most impactful"

Water Utilities Recognize Interest

- Water utility managers say they actively promote water conservation

Does your water utility actively promote water conservation?



How?

"We put out public information for customers about conservation tips and we vary our rate – the more you use, the more it costs."

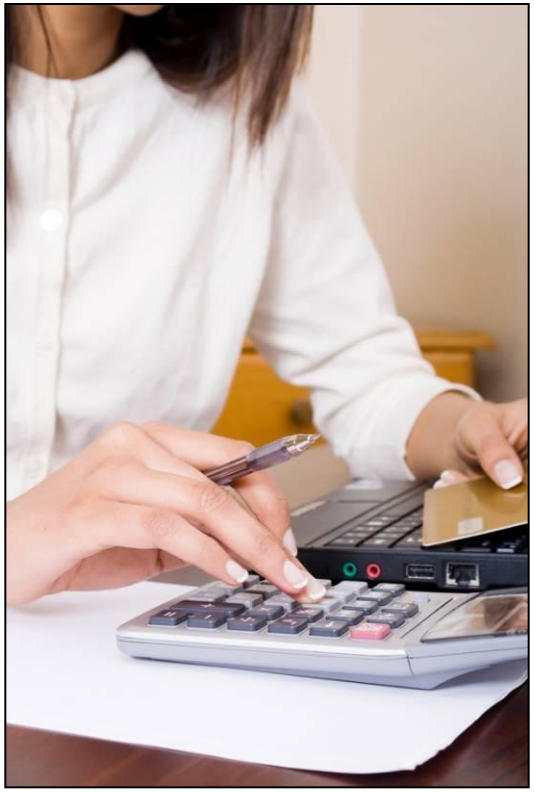
"We conduct training and have many conservation events in the community. We also send out reminders and have giveaways to remind customers to be aware of their water usage."

"We send out notifications to customers on water-saving tips and talk to them when they pay their bills about conservation techniques like fixing leaks, drippy faucets, and toilets that don't shut off."

Take Away: Water Utilities Aim To Educate

Customers Want More Information

- Despite their stated commitment to conservation, water utility managers are not doing as well as they think



Please grade your utility on its ability to provide detailed, useful information on consumer water use:

Water Utility Managers	Water Utility Customers*
59% believe their water utility does an "outstanding job"	***24%*** believe their water utility does an "outstanding job"

U.S. water utilities are significantly more likely than Canadian water utilities to believe they are doing an "outstanding job" – ***70% to 49%*** *respectively*

Take Away: Water Utilities Should Provide More Detailed Data

*Those water utility consumers personally responsible for the water costs of their home, N=763

Point to Two-Way Communication

- The majority of water consumers believe access to online consumption data would encourage them to reduce their water use

All Consumers: If your water utility offered a complimentary online tool, allowing you to monitor your water use and access detailed consumption and cost data on demand, would you access and review this information?

77% of consumers said yes or maybe

The majority of this group (71%) believes having access to this data would encourage them to **lower their water use***

Of the following information, what would be helpful to access?**	
67%	Graphs comparing their home's month-to-month use
62%	Estimated savings for different water-reduction initiatives
42%	Graphs comparing neighborhood use averages
36%	Online bill pay
19%	Water utility help desk

Take Away: More Detailed Information will Encourage Action

*Consumers who would or would consider accessing and reviewing online consumption data, N= 934 **These same consumers were asked to select all that apply, N=934

How Low Can You Go?

- More than two-thirds of all water consumers are willing *and* able to reduce their personal water use

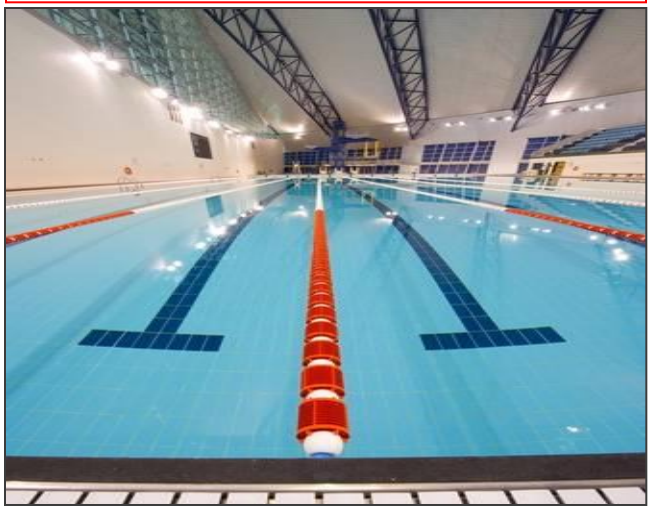
69% Percent of water consumers willing and able to reduce their personal water use

16% Percent of current daily water use these consumers* believe they could realistically save

1.4T Gallons of water U.S. and Canadian consumers believe they could save annually**

- ✓ *The United States could save 1.3 trillion gallons*
- ✓ *Canada could save 126.1 billion gallons*

In just one year, the United States and Canada could save enough water to fill more than **2.1 million** Olympic-size swimming pools***



***Based on approximately 660,000 gallons in an Olympic-size swimming pool

Take Away: Consumers See Potential for Significant Savings; Technology-Driven Information will Help Motivate Behavior Change

*Of consumers willing and able to reduce their personal water use, N=833 **Estimate based on country populations as of January 4, 2010 (http://www.census.gov/main/www/popclock.html and http://www.statcan.gc.ca/edu/clock-horloge/edu06f_0001-eng.htm), percent of consumers willing and able to reduce their personal water use, average gallons used per day (100 in the United States, http://www.epa.gov/WaterSense/resources/facts.html, and 91 in Canada, http://www.earthcarecanada.com/FAQs/Water_FAQ.asp) and estimated savings possible

Recommendations

- Water consumers:
  - ✓ ***Monitor*** your household's water use
  - ✓ ***Investigate*** if your water utility offers detailed water usage information
  - ✓ ***Educate*** yourself on ways to conserve water. Learn more at The American Water Works Association, http://tinyurl.com/learn-to-conserve
  - ✓ ***Share*** what you learn with family, friends, and neighbors

- Water utility managers:
  - ✓ ***Examine*** industry best practices; build detailed business cases to support smart meter implementations
  - ✓ ***Partner*** with your customers in their efforts to reduce water consumption. Serve as a community resource, offering water conservation education programs and gauging interest in smart meter programs
  - ✓ ***Promote*** water conservation and develop rebate programs to encourage consumers to reduce excess water use
  - ✓ ***Plan*** for long-term sustainability with technologies that will enhance your metering accuracy and efficiency
  - ✓ ***Communicate*** with your peers in the water industry to share infrastructure improvements and successes
  - ✓ ***View*** smart metering as a way to resolve leak detection issues

Methodology

- Oracle worked with O'Keeffe & Company to survey water consumers (1,210 adults) and water suppliers (302 water utility managers) in the United States and Canada. Oracle and O'Keeffe & Company contacted water consumers through a self-administered online survey and water suppliers through an interviewer-administered telephone survey

Water Consumer Sample:

Primary Residence: 65% single family home, 17% apartment, 9% townhome/twin/duplex, 5% condominium, and 4% other

Cost Familiarity:

Who is responsible for the water costs of your home?

- 63% I am
- 16% Another member of my household
- 21% My landlord/management company

Location: 50% Canada, 50% United States

Which of the following best describes the area?

- 37% Urban
- 41% Suburban
- 19% Rural
- 3% Unsure

Gender: 48% male, 52% female

Margin of error: ±2.82% at a 95% confidence level

Water Utilities Sample:

Titles:

- 48% General Manager/Director/Deputy Director
- 7% Chief Financial Officer/Chief Information Officer
- 2% Chief of Customer Service/Director of Customer Service
- 2% Chief Engineer
- 16% Director of Operations, Chief of Plant Operations or Director of Plant Operations
- 7% Water/Utility/Facilities/Metered Services Supervisor
- 18% Manager/Senior Manager

Location: 50% Canada, 50% United States

Which of the following best describes the area?

- 32% Urban
- 13% Suburban
- 54% Rural
- 1% Unsure

Number of employees at water utility: 73% less than 20, 15% 20-99, 12% 100 or more

Years working in the utilities industry: 25% less than 10 years, 13% 10-14 years, 12% 15-19 years, 50% 20 years or more

Margin of error: ±5.60% at a 95% confidence level

Appendix I: U.S. Water Utilities

Have U.S. water utilities adopted smart meter technology?*

62% are not currently considering a smart meter program

15% have assessed the opportunity

8% have prepared a strategic plan for adoption

7% have implemented a smart meter pilot program

7% have fully implemented a smart meter program

64% believe it is critical for water utilities to adopt smart meter technologies

Top two smart meter benefits:

#1 Enabling early leak detection (66%)

#2 Providing more accurate water rates (25%)

Top two smart meter roadblocks:

#1 Up-front water utility expenses required (51%)

#2 Lack of cost recovery/measurable ROI (49%)

*1% of U.S. water utility managers were unsure of their organization's adoption status

Appendix II: Canadian Water Utilities

Have Canadian water utilities adopted smart meter technology?*

66% are not currently considering a smart meter program

9% have assessed the opportunity

6% have prepared a strategic plan for adoption

7% have implemented a smart meter pilot program

7% have fully implemented a smart meter program

72% believe it is critical for water utilities to adopt smart meter technologies

Top two smart meter benefits:

#1 Enabling early leak detection (58%)

#2 Supplying customers with the tools to monitor/reduce water use (46%)

Top two smart meter roadblocks:

#1 Lack of cost recovery/measurable ROI (42%)

#2 Up-front water utility expenses required (34%)

*5% of Canadian water utility managers were unsure of their organization's adoption status