WHITE HOUSE SUMMIT ON WATER AND BUILDING A SUSTAINABLE WATER FUTURE

AMERICAN WATER

WE ARE AMERICAN WATER

American Water is the largest and most geographically diverse publicly traded U.S. water and wastewater utility company. Marking its 130th anniversary this year, the company employs 6,700 dedicated professionals who provide regulated and market-based drinking water, wastewater and other related services to an estimated 15 million people in 47 states and Ontario, Canada.

We are committed to addressing America's greatest water challenges that threaten our sustainable water future through investment, technology and expertise.

THE NEED (AND SOLUTION) IS CLEAR

The nation's water industry must invest more in its system now because:

- **By 2020, 44 percent of U.S. pipe infrastructure will be classified as poor, very poor, or life elapsed.** American Water replaces about 350 miles of pipe each year.
- **In the U.S., 2 trillion gallons of treated water is lost each year.** American Water is working on new leak technology.
- **900 billion gallons of untreated sewage is discharged every year**. American Water has invested $175 million in wastewater infrastructure since 2010.
- **Nationwide $1 trillion is required in water systems over the next 20 years.** American Water will invest $5.5 billion in the next five years.

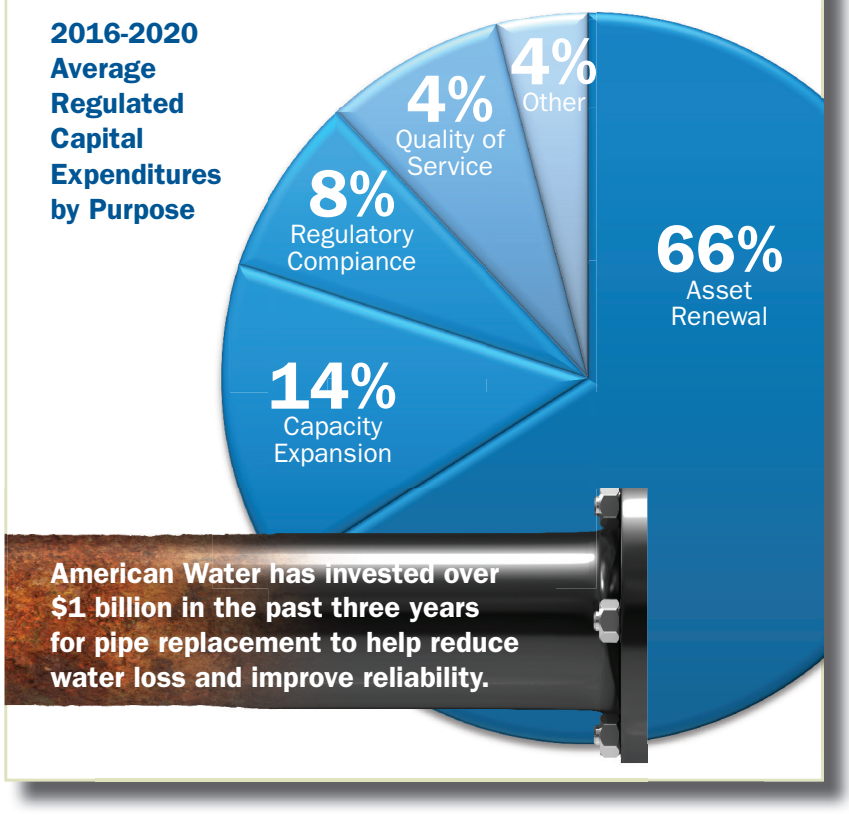
THE SOLUTION INVESTMENT

$5.5 BILLION IN 5 YEARS

American Water is committed to delivering clean, safe, reliable and affordable services to its customers. After investing $1.2 billion in infrastructure investments in 2015, American Water announced it will spend $5.5 billion in the next five years to help improve service reliability and water quality for its customers.

These investments include pipe replacement, capacity expansion, and investment in water and wastewater infrastructure to continue to meet regulatory requirements. American Water works hard to meet federal, state and local standards for water quality. Not only does the company meet standards, it often surpasses them. American Water's record of compliance for meeting all drinking water requirements is 13 times above the industry average. To date, American Water has received more than 65 Environmental Protection Agency awards for voluntarily surpassing drinking water standards.

2016-2020 Average Regulated Capital Expenditures by Purpose



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RESEARCH AND INNOVATION

American Water has had an organized research program for 35 years and is a leader in water innovation. The challenges to water systems are many, from climate change to changing customer expectations; from aging infrastructure to an aging workforce; from new regulations to new technologies. Research is needed so that water utility managers can make sound fact-based decisions to best serve their customers and protect public health.

$3 MILLION IN NEW PROJECTS IN 2016

Here are just a few:

Investigate the ability of a novel adsorption/oxidation technology (the Arvia Organics Destruction Cell) to degrade contaminants of emerging concern (CECs) from secondary wastewater effluents as an alternative to reverse osmosis treatment for reuse applications.

Evaluate a novel catalytic technology for nitrate removal that generates no waste stream. This $960,000 project co-funded by the Binational Industrial Research & Development (BIRD) Foundation is particularly useful for the 3,500 mostly small utilities with persistent nitrate contamination.

Examine a new reverse osmosis membrane that promises to increase production rates and lower energy costs. The membrane is also resistant to chlorine disinfection – making it easier to control biofouling problems.

Pilot an ultraviolet system for rapid disinfection of water distribution system pipelines following main breaks. This technology could reduce the time for customer interruption while improving public health protection.

Field test an innovative electronic sensor technology that will accurately measure multiple water quality parameters at the same time. This digital system will allow for faster and more precise water quality testing.

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HARNESSING DATA ANALYTICS TO DRIVE CONSERVATION

Capital allocation efficiency, lower production costs and improved system reliability

System water loss is a pressing issue facing the water industry. As demand for clean, affordable water grows, the importance of an efficient and modern delivery system takes center stage.

American Water leads the industry in coming up with creative solutions to reduce water loss. One way we do this is by harnessing smart devices, including sensor technologies, and leveraging data to surgically isolate and address system water loss and predict water loss issues before they occur.

The internet of things (IOT) holds promise for further innovative approaches. American Water is partnering with IOT industry leaders that have experience delivering innovative solutions to other industries to address system water loss. One such area is remote pipeline monitoring and management currently used by oil and gas companies.

Reducing water loss benefits customers:

Capital Allocation Efficiency Our nation's water and wastewater infrastructure is in dramatic need of investment and repair. To highlight this: The American Society of Civil Engineers issued a grade of "D" to our nation's water and wastewater infrastructure. The American Water Works Association estimates it will cost more than $1 trillion to repair, replace and expand buried water pipe alone by 2035, with an additional $700 billion by 2050.

American Water has invested over $1 billion in the past three years for pipe replacement to help reduce water loss and improve reliability. Infrastructure is being replaced because it has exceeded its useful life and infrastructure integrity is a major culprit of system water loss. Using advanced technology that provides additional intelligence to replace infrastructure based on water loss impact would unlock additional value and further drive down system water loss.

Lower Production Costs Every drop of water delivered carries a unit cost of production. Most notably chemical and energy costs. Reducing system water loss not only improves water efficiency, but it also reduces these embedded costs and provides additional societal benefits such as promoting energy productivity.

Improved System Reliability American Water's service record is tops in the industry, but nothing is more troubling to customers than an unanticipated service disruptions due to a ruptured pipeline. Leveraging advanced analytics to better predict pipeline integrity issues before they materialize would serve to improve system reliability and limit unexpected service outages.

Our Latest Partner: General Electric

American Water is working with General Electric (GE) as a part of GE's Ecomagination strategy to identify and explore advances in the Internet of Things (IOT) to help solve pressing challenges within the water industry. This includes collaborating with GE's Water and Digital Solutions teams on software and data analytics using GE's open source Industrial Internet platform, Predix™.

Policy Support TECHNOLOGY FUNDING

The traditional and proven solution to water loss related to pipeline integrity is simply the replacement of all U.S. water system pipeline infrastructure. Unfortunately, that approach alone will take decades at a massive cost that is well documented. While there is already a mature market devoted to innovations around pipeline technology, little R&D is devoted to water system modernization trends such as the application of IOT technologies. For companies like American Water who aspire to reimagine the water system of the future, support from the state and federal agencies will go a long way to accelerating an efficient and sustainable water system.

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ComEd
An Exelon Company

DRIVING EFFICIENCY THROUGH TECHNOLOGY

The Power of Advanced Metering

Advanced metering infrastructure (AMI) —the ability to read customer meters remotely and to collect, analyze and act on the data—opens a new door to a future of water efficiency. AMI creates the potential to make usage information available regularly, giving customers the power to control usage while giving water utilities the ability to identify and maintain water system losses and become more efficient. Some water utilities—including American Water—are already piloting this powerful AMI technology. There are many potential benefits:

Tools for Customers: With digitally available information on their water usage, customers could manage water usage in a number of ways.

- Receive "high usage" and "potential leak" alerts.
- Participate in creative programs which incent water efficiency.
- Use disaggregation tools to better understand water use and make smart choices.

Tools for Water Utilities

- **Leakage Detection:** Data analytics could enable upstream detection of water system faults—from a leaking main or valve to a frozen water main.
- **Backflow Detection:** Regular monitoring could allow for more quickly identifying backflow conditions for faster resulting response to prevent potential contamination.
- **Water Quality Monitoring:** Sensors could be deployed on a mesh AMI network, allowing for regular monitoring of water quality.

A Creative Approach: Leveraging Existing Smart Infrastructure

While water utilities are just beginning to explore the possibilities of AMI, the electric industry has deployed smart infrastructure in many locations and is already providing data and tools for customers to save energy. This presents an opportunity for water utility efficiency programs.

American Water and ComEd are prepared to announce a pilot to explore the use of ComEd's smart metering infrastructure in Illinois to achieve water system savings and conservation. By utilizing ComEd's existing mesh network, American Water can set its customers on a path to achieve the water efficiency possibilities of AMI. Cross-utility partnerships like this also offer the benefit of knowledge sharing and lessons learned by electric utilities. ComEd's implementation of the 2011 Smart Grid law has led to the development of many programs and tools with powerful water system corollaries, including customer disaggregation tools that incent energy savings, neighbor comparison tools, and unusual usage notifications.

Given the nexus between energy and water usage, a partnership like this can benefit energy and water systems. When water is saved, less energy is used to extract, treat, and pump water to the public, thus producing important additional environmental benefits.

In short, the American Water-ComEd partnership represents a collaborative and potentially scalable, sustainable approach to water efficiency that can serve as a model for utilities for years to come.

Policy Support STABLE REVENUES

Tools like AMI can create a number of benefits for customers and society, but these benefits can also place utility revenues at increased risk. To help offset this, many policy makers around the country are either instituting or considering regulatory mechanisms that protect fixed cost recovery. There are many options, but the U.S. Department of Energy, the Natural Resources Defense Council, the Alliance for Water Efficiency and the American Council for an Energy Efficient Economy have all recommended mechanisms that stabilize revenues by severing the relationship between water sales and cost recovery. This and other creative approaches can help unlock the full benefits of programs like AMI.

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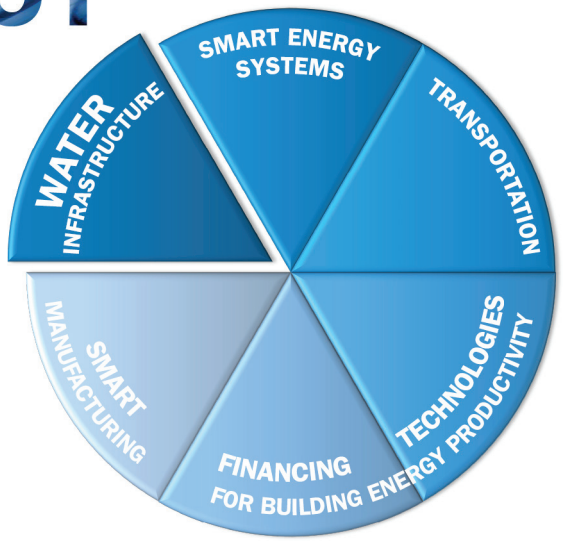
WATER AND ENERGY EFFICIENCY

12.6% of Energy Use in the United States is Water-Related

In every step of the public water cycle, energy is required. Energy is used to extract, treat and pump water to citizens throughout the United States. Energy is used to heat, cool, pressurize, and move water once it reaches homes, businesses, and industries. And energy is used to pump, lift, and treat the resulting wastewater before its release back into the environment. When you add up all of this energy, it accounts for approximately 12 quadrillion BTU's or roughly 13 percent of our country's annual consumption of electricity, natural gas and petroleum.

Water Infrastructure is a Key Path to Improving Energy Productivity

There is tremendous potential for increasing the efficiency of the U.S. water system. Indeed, the U.S. Department of Energy identified "water infrastructure" as one of the key ways for doubling energy productivity by 2030. A few examples of potential efficiency include:



Replace or Refurbish Water Pumps

Over 85 percent of energy used in public water systems is for pumping. But there is a potential to improve the efficiency of pumping systems by up to 30%, saving up to 10 TWh per year—enough electricity to light up Washington D.C. for more than a decade.

Improve wastewater aeration

This consumes 30-50 percent of the energy needed for wastewater treatment. Improvements such as American Water's patented NPXpress technology can reduce energy needs by up to 50 percent.

Replace aging leaking pipes

Throughout the U.S., 20-25 percent of all public water goes unaccounted for due to leaks and other losses, meaning 20-25 percent of energy used to pump and treat that water is also lost. Replacing aging, leaking buried pipes can improve energy efficiency.

Reduce water end use

This has a two-fold energy impact, as efficiencies can be achieved on both the utility and customer side of the meter. Efficiency opportunities abound for indoor and outdoor practices, appliances, fixtures and sensors.

American Water is Leading through Innovation

America Water pursues energy efficiency through not only pump efficiency, patented technologies, pipe replacement, and end use reduction, but also through renewable energy projects and innovative geothermal pilots. This helps us reduce energy costs for our customers, while protecting natural resources and promoting both public and economic health.

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