

Turned on or tapped out?

WATER UTILITIES CONFRONT THE WATER CHALLENGE

Public water utilities in the U.S. face a crisis that could mean the end of clean, cheap water. As climate variability and extreme weather events affect the quantity and quality of freshwater, the industry is being challenged to deliver services and protect vulnerable infrastructure without driving up prices. New technologies and practices could save costs, preserve infrastructure, and conserve water over the long term.

Taking the tap for granted

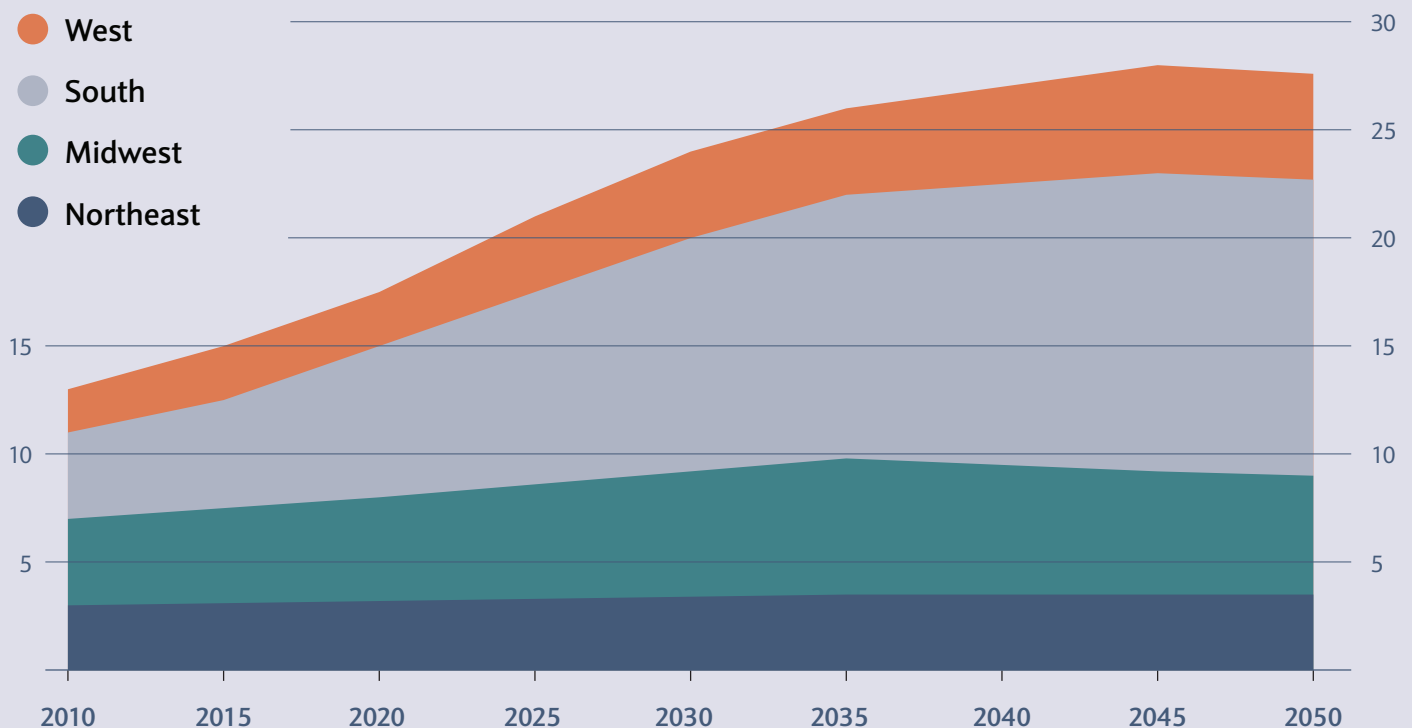
Most of us expect safe, clean water to be there when we need it. Water scarcity presents constraints for utilities, as do the significant infrastructure, treatment and maintenance costs that go into delivering water to homes and businesses. The tragic events surrounding the lead contamination of the Flint, Michigan water supply highlight the risks of operating a water distribution system.

An aging infrastructure

Antiquated water systems are a huge problem across the U.S. But the cost to upgrade is high – water main replacement alone could cost \$25bn annually by 2030. Additionally, few public water utilities have sufficient funds for research and development of long-term solutions, like leak-detection and smart metering.

WATER MAIN REPLACEMENT PROJECTED ANNUAL COST

Spending in Billions (\$)



240,000

Estimated water main breaks
per year in the U.S.

\$1 trillion

Investment needed to replace those
pipes over the next 25 years.

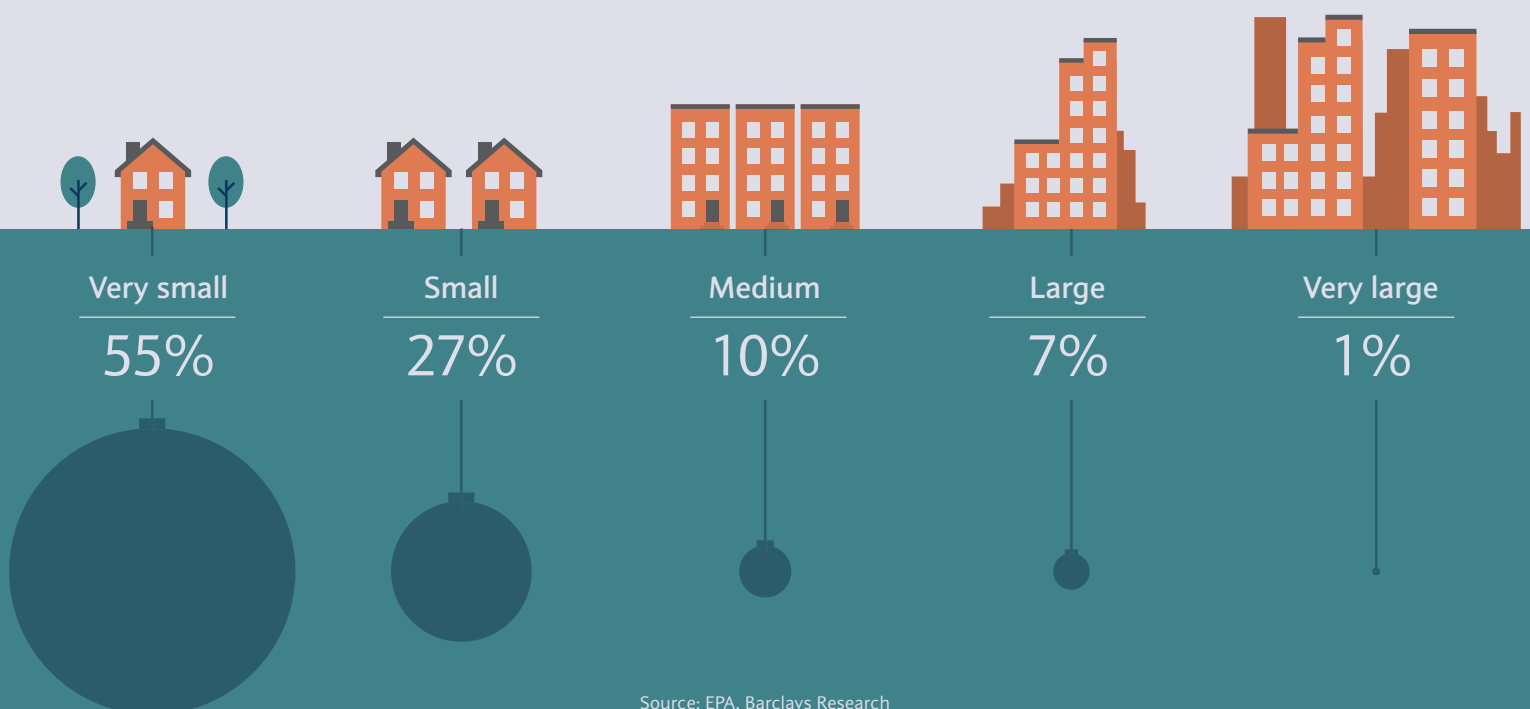
Drought as a driver of change

Water scarcity caused by drought has a direct effect on public health, availability of food and, ultimately, public safety. Simple measures include demand management, energy efficiency, and consumer education. These strategies have worked well for utilities in drought-prone California to promote conservation.

A fragmented industry

The problems of water utilities are exacerbated by fragmentation, regional concerns and lack of cooperation and coordination. Large-scale pipe replacement and refurbishment, and investment in new wastewater treatment plants can be a significant financial burden. Since most water systems serve a relatively small and widely dispersed customer base, the cost becomes even greater.

WATER SYSTEMS BY CUSTOMER COUNT

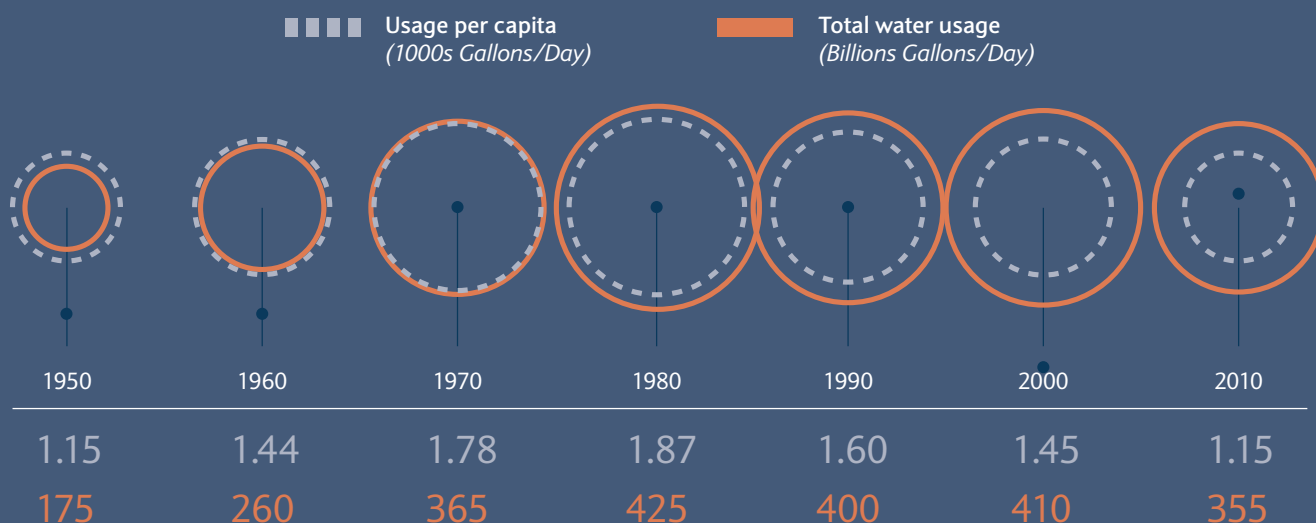


Source: EPA, Barclays Research

Flowing in the right direction

Water usage in the U.S. peaked in the 1980s, and then became flat. However, average use per person has been declining steadily – a positive shift that can be attributed to improvements in water metering and conservation measures. We expect this to continue.

CHANGES IN AGGREGATE WATER USAGE AND CONSUMPTION IN THE U.S. 1950-2010



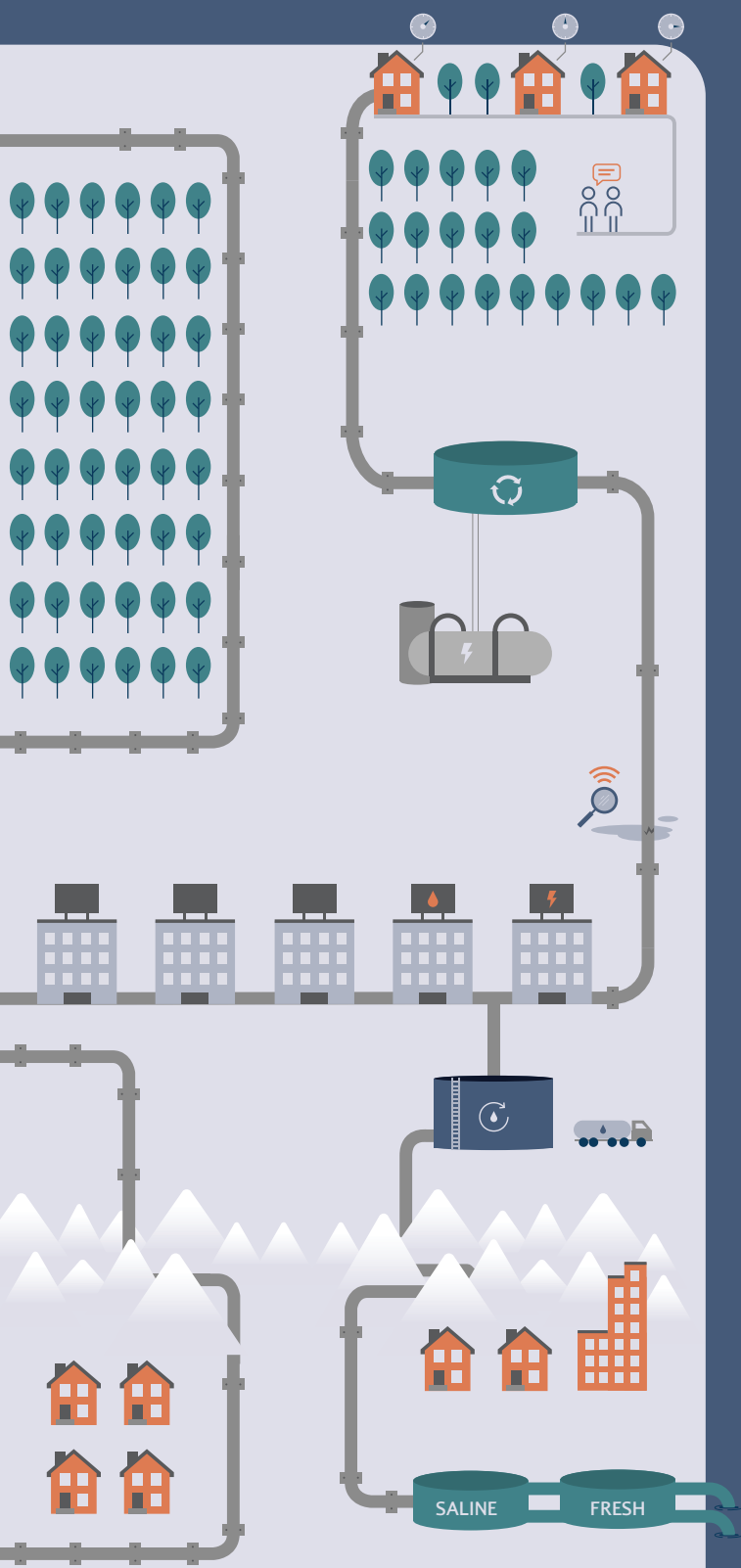
Source: US Geological Survey, US Census Bureau, Barclays Research

New thinking about water for utilities

We believe that more consistent regulations and increased infrastructure investment can prevent problems and encourage innovation. Although technologies such as desalination, potable reuse and leak detecting already exist, implementing them requires additional financing.

Water solutions that work for utilities

Water utilities need to develop new technologies, reduce freshwater use, and consider alternative sources of water. Cross-industry collaboration and government support for new policies and practices can help these initiatives to scale.



+ Smart metering

Smart meters read water usage in real time, and send it back to the utilities to evaluate consumption, identify leaks, reduce operating and maintenance costs, and improve billing accuracy.

+ Customer engagement

Individuals can begin thinking about water constraints as part of an overarching climate problem. Consumer education around conservation and smart metering helps customers become aware of how much water they use, and how a solution as simple as replacing your showerhead could save water.

+ Wastewater reuse

Wastewater utilities have several steps from source to end-use. Wastewater from residential and industrial users is collected in a sewer system, along with rainwater, and storm water runoff. Primary treatment removes suspended solids, and other large items, like trash. Disinfection kills organisms and pathogens that could cause disease.

+ Energy efficiency

Water treatment facilities use large amounts of electricity for pumping, conveyance and treatment. Moving to energy-saving pumps and motors are some of the efficiency measures that can make a big difference.

+ Leak detection/Inline Sensors

Acoustic monitoring is paired with smart meters to listen for leak “noise” that can help water utilities identify pipe leakage and prevent water loss. Inline sensors improve water quality monitoring.

+ Industry Coordination/Consolidation

There are many opportunities for water and electric utilities to manage supplies and plan for future periods of water scarcity and stress. There is also scope for utilities to consolidate in a drive to be more efficient.

+ Integrated resource planning

Utilities should not only coordinate their efforts to save, share and reuse water, but they can also work together to standardize the way they collect and interpret data on water consumption. Such cooperation will make it easier to plan for future water scenarios.

+ Regional planning

Ideas for conserving water include water trading, and particularly transferring water from regions with abundant water supplies to arid regions. Some parts of the U.S., like California, already have water-trading markets. While still small scale and relatively inefficient, these could be used to transfer surplus water to users in need.

+ Desalination

Widely used in the Middle East, desalination treats non-potable brackish and seawater to freshwater standards for oil and gas drilling, irrigation, industrial use, power plant cooling and drinking water.

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