

Electrical Markets Division

# 3M Water Infrastructure

June 22, 2015



# Global megatrends indicate serious challenges for our drinking water

Increasing stress on the water system

Population

Energy

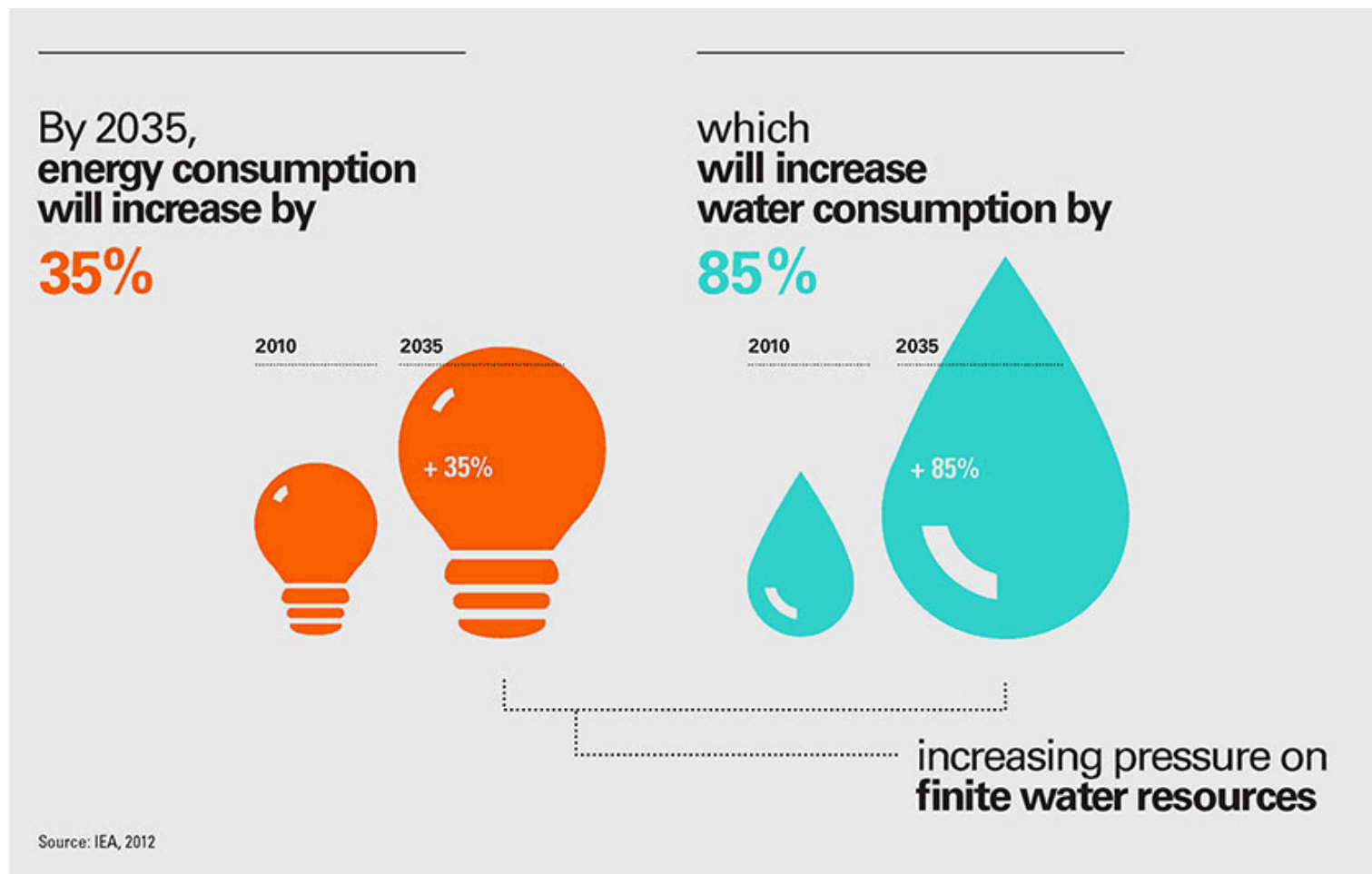
Increasing loss within the water infrastructure

Globally lose 20% of water between treatment and home



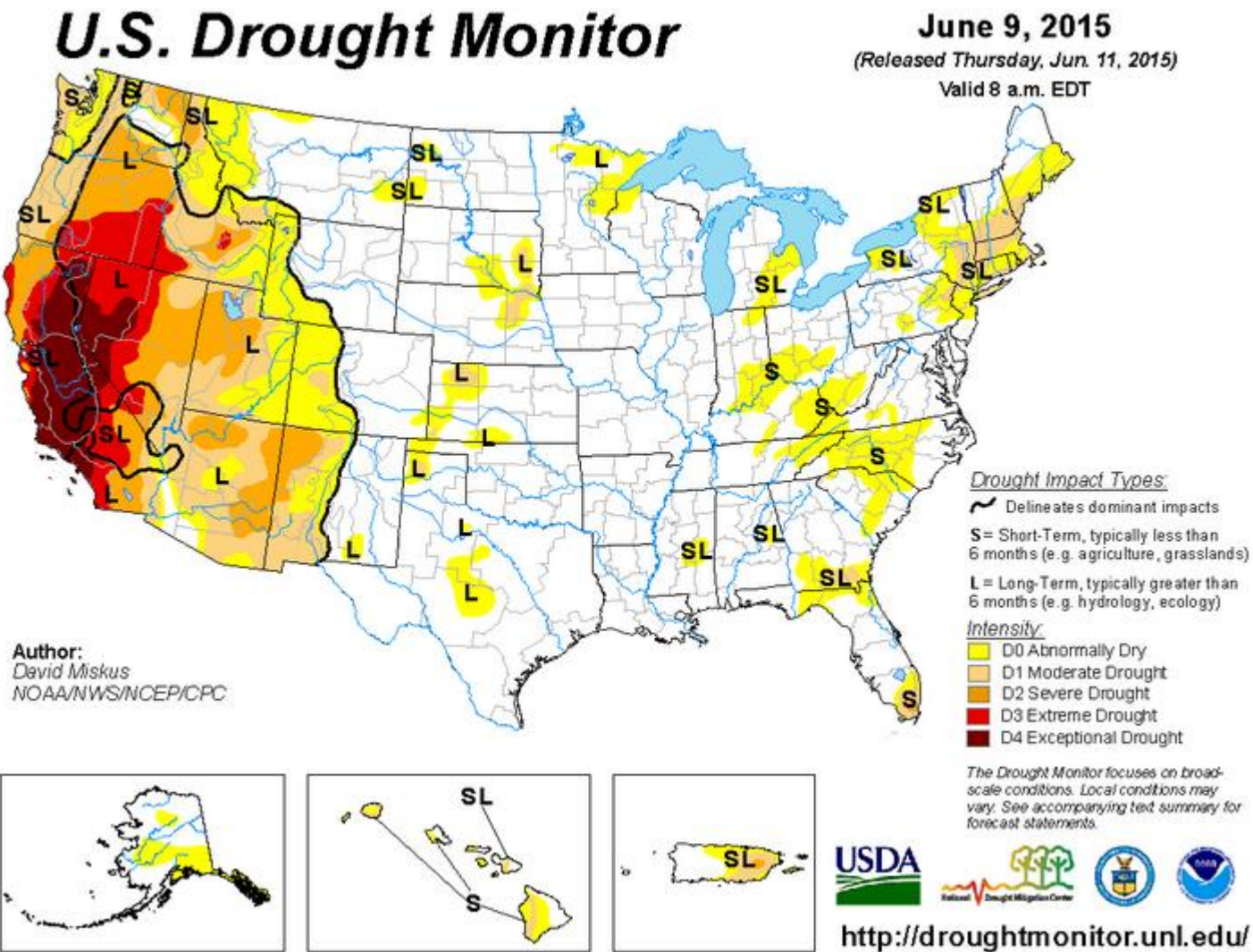


# Population growth leads to higher energy needs and more stress on water



Source: <http://www.worldbank.org/content/dam/Worldbank/Feature%20Story/SDN/Water/Water-Thirsty-Energy-Infographic-FULL-Vertical-900.jpg>

# Climate conditions in the US are not helping either



## LATEST DROUGHT STORIES ...

- San Jose to face mandatory water rationing with monthly allotments
- Drought impact felt across West
- California pool, hot tub filling bans have industries steaming

# AWWA's latest State of the Water Industry Report paints a bleak picture

US requires \$1T in water infrastructure renewal over the next 25 years

Three out of four utilities in North America report flat or declining sales and revenues

16% of utilities are concerned that they will not be able to cover the cost of services and repairs through rates/fees

There are 650 main breaks/day in the US

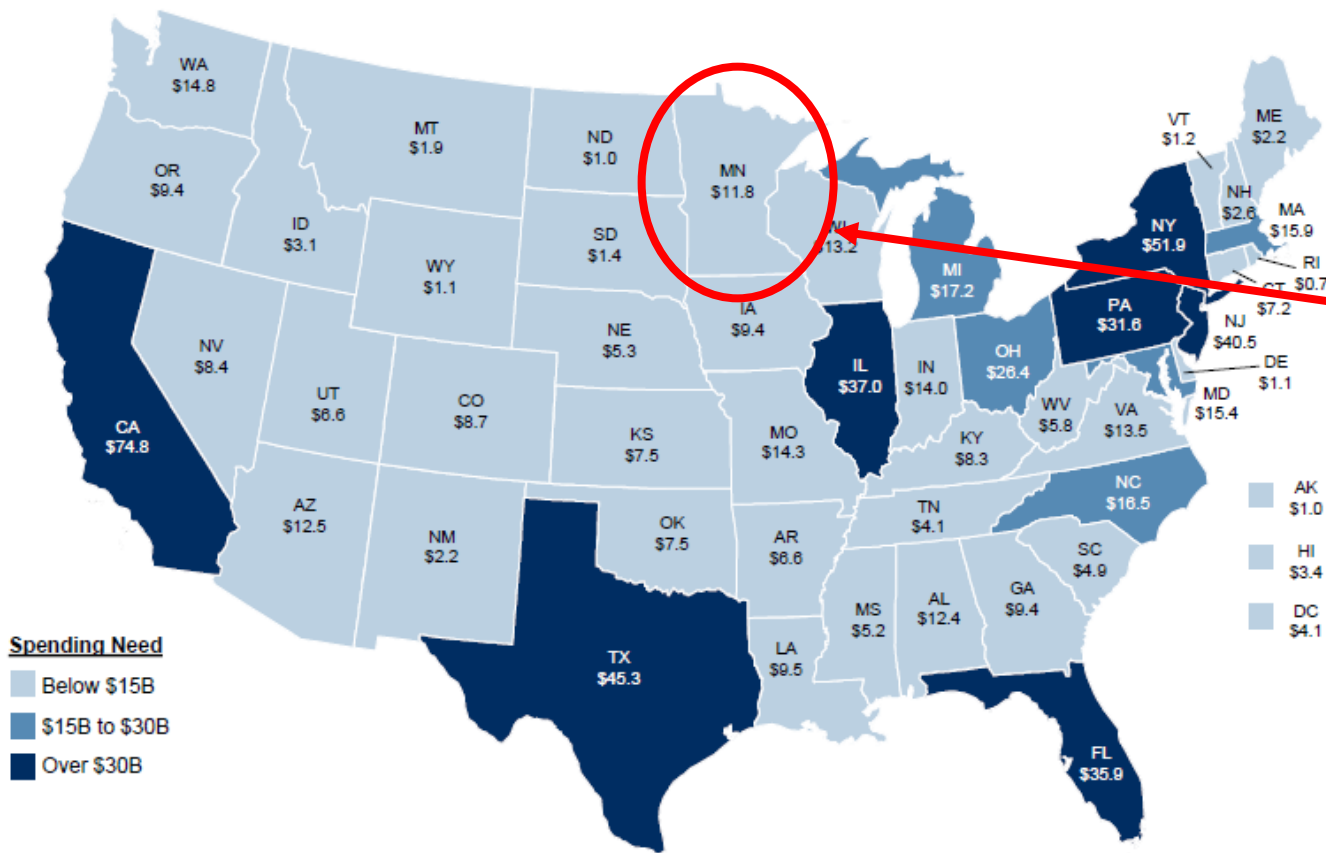
What needs to be fixed?

Top 5 most important issues facing the water industry (per survey of 1,747 members)

- 1) Renewal and replacement of aging infrastructure
- 2) Financing for CapEx
- 3) Long-term water availability
- 4) Public's poor understanding of water services
- 5) Public's poor understanding of water resources

## WATER & SEWER INFRASTRUCTURE NEEDS BY STATE TO 2030

- Reflecting population distribution, California, Texas, New York, New Jersey, Illinois, Florida, and Pennsylvania account for \$317 billion of the \$665 billion of water & sewer infrastructure spending needed through 2030



What are the options to meet this \$11.8B need?

**Spending Need**  
 Below \$15B  
 \$15B to \$30B  
 Over \$30B

Source: EPA.

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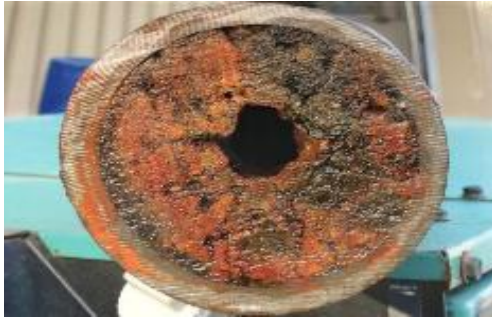




# How do you go from current infrastructure state to the desired state?



# 3M wants to extend the life of these assets by keeping them buried



Some pipes have tuberculation, corrosion related pin-hole leaks, and brown water

**Corrosion barrier**  
Prevent tuberculation and corrosion related pin-hole leaks, and protect clean water



Some pipes are more deteriorated and require a structural enhancement solution

**Structural enhancement**  
Internal pressure containment that will withstand the formation of small holes or gaps



Some pipes are close to failure

**Pipe replacement**





# 3M's solution can solve multiple problems with one solution



Some pipes have tuberculation, corrosion related pin-hole leaks, and brown water

Thin coating



Some pipes are more deteriorated and require a structural enhancement solution

Thick coating



## Scotchkote 2400



**Corrosion barrier**  
Prevent tuberculation and corrosion related pin-hole leaks, and protect clean water

**Structural enhancement**  
Internal pressure containment that will withstand the formation of 2 in (5 cm) corrosion holes



# Case Study – Dual Application while Returning Water to Service Same Day

## Oswego Water Department, Oswego, NY

### Challenge:

- Severe water discoloration due to tuberculation
- Three emergency repairs/splices in two years
- Time and budget constraints

### Solution: Scotchkote Liner 2400

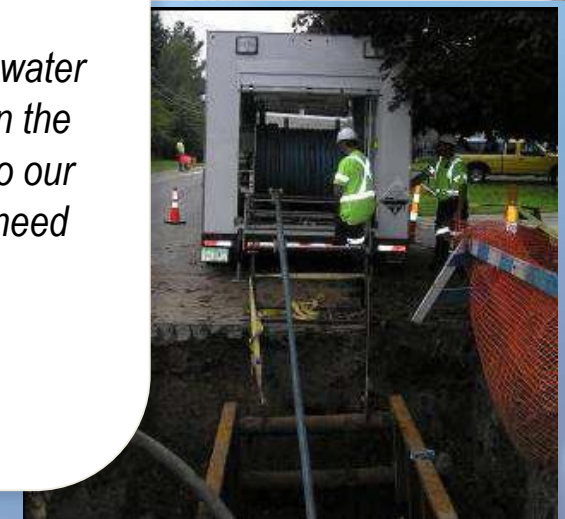
- Resolved water quality issues
- Improved pipe integrity by spanning pitting, pin holes and gaps
- Returned to service each day by 6 p.m., with boil notices
- Provided significant cost savings by eliminating the use of bypass pipes
- Project was 5 days, 350 – 490 ft/day

### Pipe description:

- Six inch (150 mm) cast iron pipe, installed in 1923
- Length: 2,265 feet (690 m)

*“The City of Oswego had a water main with a section where residents experienced severe water discoloration due to tuberculation and also an adjacent section with a history of excessive line breaks. 3M's Scotchkote Liner 2400 was the perfect solution to address the dual application of improving water quality and pipe integrity. The ability to return water service in the same day (with boil water notices) was of particular benefit to our customers and significantly reduced cost by eliminating the need for bypass lines.”*

Brian J. Folgherait, Plant Manager  
City of Oswego Water Dept.







# Back-up Charts

# 3M Science. Applied to Life.



## Consumer

Simplifying life and work



## Industrial

Changing how industry works



## Health Care

Promoting health and quality care



## Safety & Graphics

Enhancing you safety, security, and interactivity



## Electronics & Energy

Enabling power, telecommunications and electronic networks and devices

# 3M Science. Applied to Potable Water.

- In situ -- 3M™ Scotchkote™ Pipe Renewal Liner 2400
  - Corrosion protection– prevent “brown” water due to corrosion and tuberculation
  - Structural enhancement – prevent leaks from pin holes, cracks, corrosion pitting
- Factory applied -- Pipe, valve and pump corrosion protection
  - 3M Scotchkote 206N and 134W fusion bonded epoxy (FBE)
  - 3M Scotchkote 162 PWX liquid epoxy
- Filtration -- Membrane, carbon, non-woven filters and hardware
  - Residential/commercial -- improve water taste and purity by removing particles, odors and trace contaminants.
  - Industrial -- improve product quality and safety by removing particles, gels, pigments, bacteria and virus
  - Municipal -- Pre-filtration to remove sediment prior to RO systems

