

## Industrial Water Use and Reuse Workshop

April 30-May 2, 2013

**Ralph E. Exton**

Chief Marketing Officer

GE Power & Water, Water & Process Technologies



International Society  
for Water Solutions

# Industrial Water Use and Reuse Workshop

## Tuesday, April 30

- Evening Reception

## Wednesday, May 1

- Opening Remarks
- Keynote Address
- Technical Sessions
  - Regulatory Climate
  - Industry Perspectives
  - Technology and Applications
- Networking Reception

## Thursday, May 2

- Opening Remarks
- Technical Sessions
  - Practical Implementation
  - Expert Panel
- Wrap Up



# Industrial Water Use and Reuse Workshop

## Session Chairs

- Jim Goodrich, EPA
- Walker Garrison, Valero
- Dave Mason, GE Power & Water
- Loraine Huchler, MarTech Systems
- Tracy Young, Dow

## Keynote Address

- Amanda Brock, Water Standard

## Organizing Committee

- Jeanette Brown, UConn
- Walker Garrison, Valero
- James Goodrich, EPA
- Loraine Huchler, MarTech Systems
- Annette Johnston, Abbott
- Wendy Reed, Chemstations
- Ari Selvakumar, EPA
- Laura Watson, GE Power & Water
- Tracy Young, Dow
- Janet Goodwin, EPA



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# Industrial Water Use and Reuse Workshop

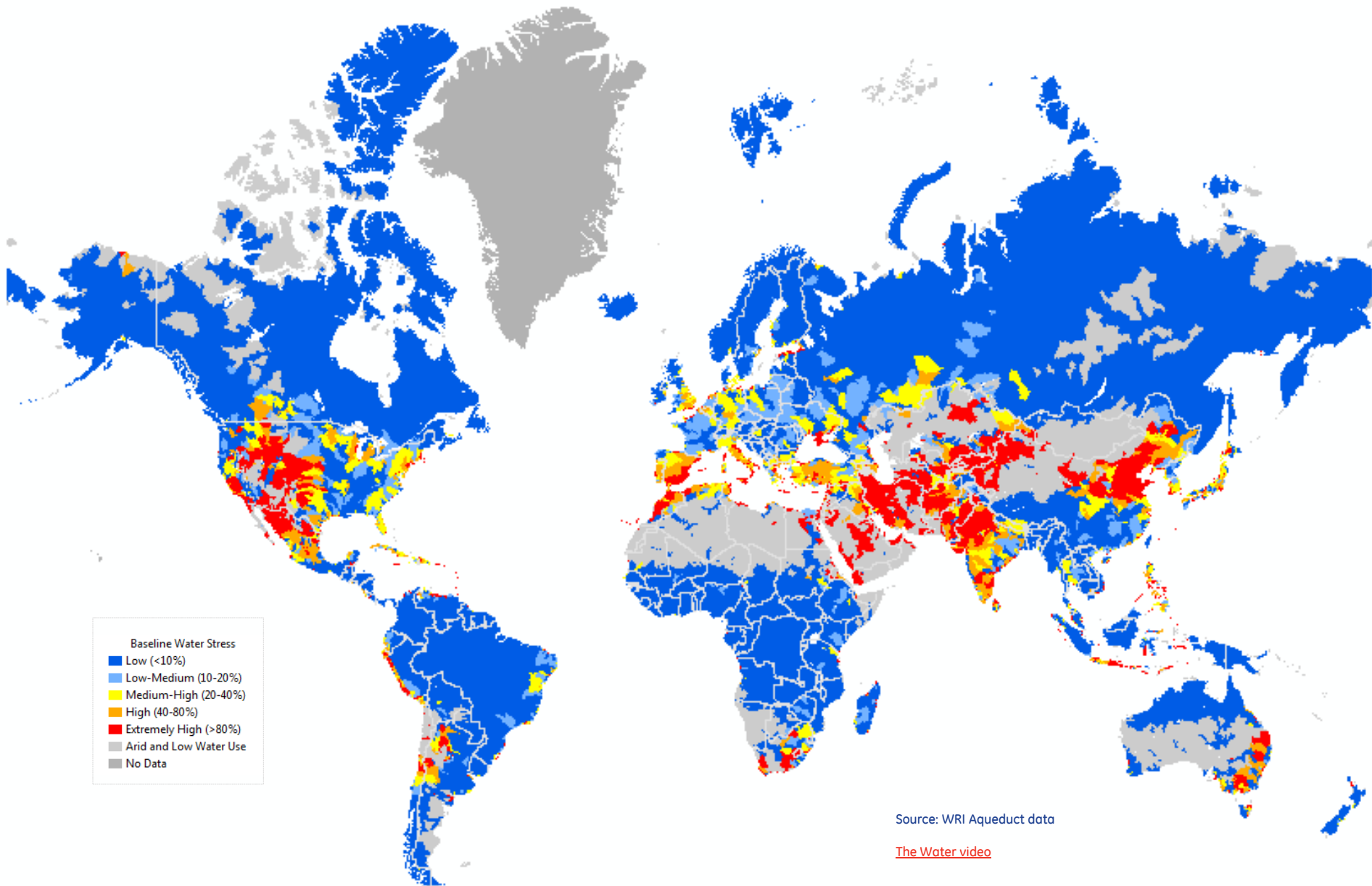
## Experts / Presenters

- Amanda Brock, Water Standard
- Jon Freedman, GE Power & Water
- Julie Klumpyan, TRDWC
- James Brown, EPA
- Travis Capps, Valero
- Gena Leathers, DOW
- Carson Barry, New Page Corp
- Robin Jenkins, Dupont
- Jim Myers, Chevron
- Erik Hanson, GE Power & Water
- James Mihelcic, Univ. of S. Florida
- Larry Gurnari, Veolia
- Steve Gluck, Dow
- Joe Walters, West Basin MWD
- Al Pristera, Nalco
- Tim Eggert, GE Power & Water
- Jerry Levine, Water & Power Consultants
- Tara Lee Lanier, Marathon Petroleum
- Mikel Goldblatt, Ashland
- Sidd Dunn, Baker Petrolite



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# Global water scarcity today – WRI Water Atlas

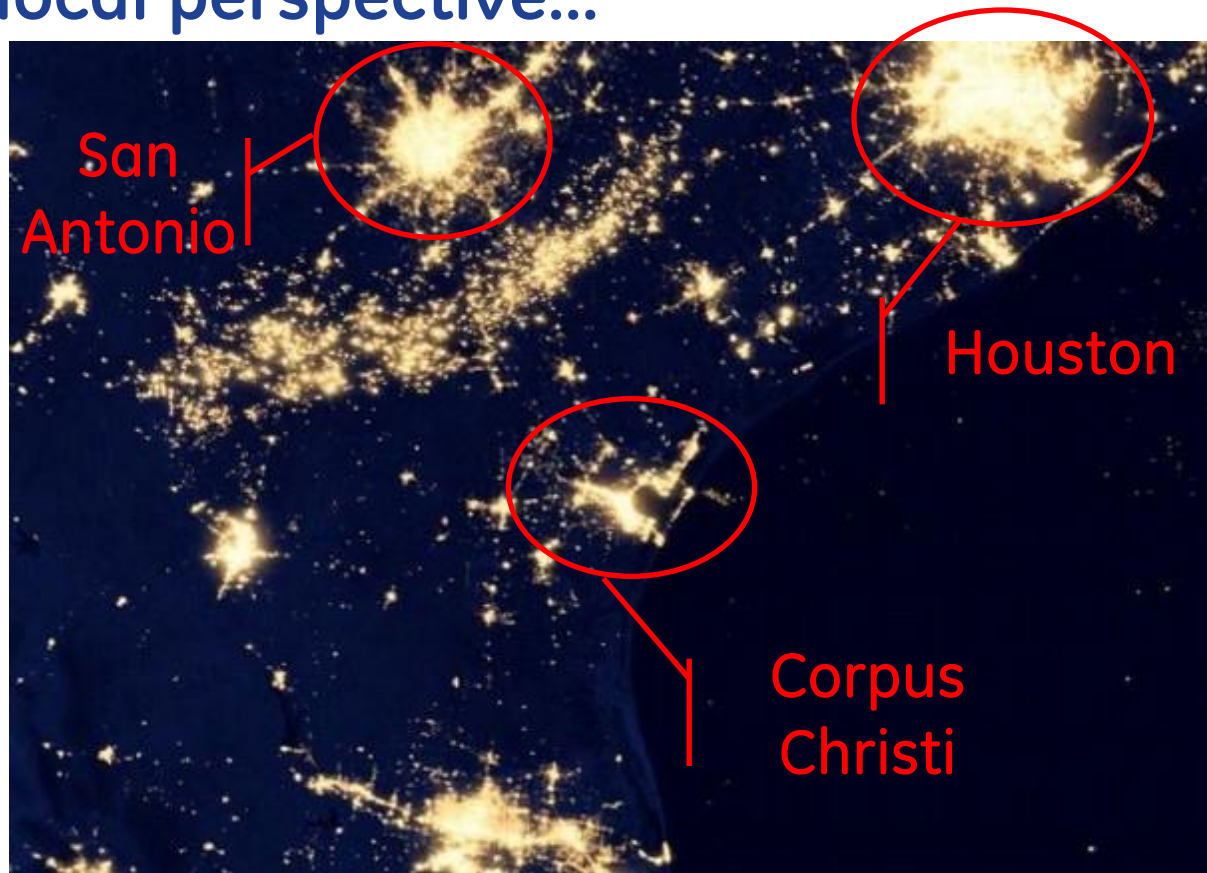


Source: WRI Aqueduct data

[The Water video](#)

# Industrial Water Use and Reuse Workshop

A very local perspective...



2007

2012

# Water Reuse: The Public Perception

# Survey Methodology

- StrategyOne conducted an online survey among a total of 3,000 adults, 18 years or older, 1,000 each in the US, Singapore, and China. Interviewing took place from June 1–11, 2012.
- The margin of sampling error at the 95% confidence level is as follows:
  - US (n=1,000): MOE = +/- 3.1%
  - Singapore (n=1,000): MOE = +/- 3.1%
  - China (n=1,000): MOE = +/- 3.1%
- The data set for each country is nationally representative of the population of that country.



# Americans Strongly Support Reusing Water to Combat Water Scarcity

**66%**

of Americans feel positive about water reuse.



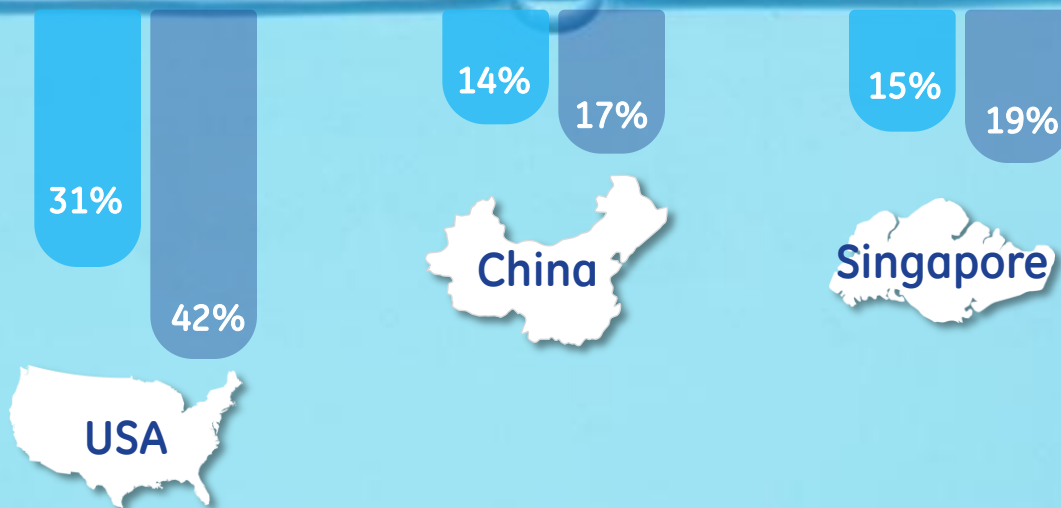
were in favor of swimming in recycled water. Nearly one third (30%) support, drinking it – and half of Americans agree that it is drinkable (51%).

# Americans' Understanding of Water Lifecycle and Solutions Falls behind Water Challenged Countries...

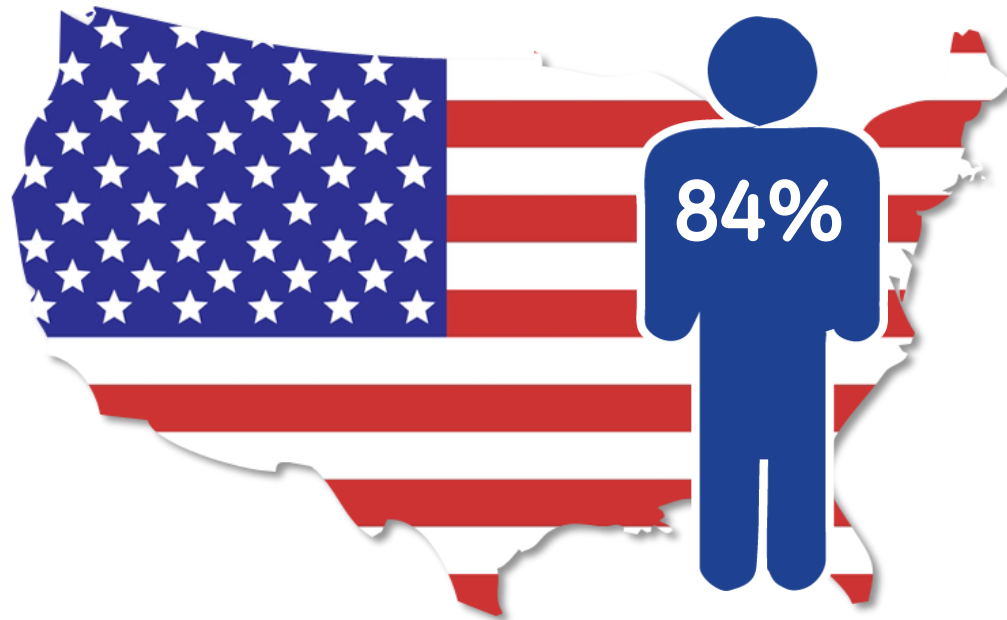


**31%** of Americans don't know where their water comes from, compared to only **14%** of those in China and **15%** of those in Singapore.

**42%** of Americans don't know how their water is purified, compared to only **17%** of those in China and **19%** of those in Singapore.



# Concerned about Sufficient Water Supplies, Americans Call on National Government to Step Up and Lead on Water Resources to Protect Economic Competitiveness



**84%** of Americans believe the protection of water resources should be a national priority.

**70%** of Americans feel the US would have a competitive advantage over other countries if we increased the amount of water we reuse in a safe and efficient manner.



# Americans understand intimate connection between Energy and Water, expect Power Industry Players to demonstrate Water Stewardship

**74%**

of Americans are aware that you need water to create energy.



Americans believe smart water management can help the US more efficiently create and use energy.

A worker in a yellow safety vest and white hard hat is working on a large industrial turbine. The worker is wearing safety glasses and gloves, and is using a tool to work on the turbine's blades. The turbine is a large, complex piece of machinery with many curved blades. The background is a blurred industrial setting.

# 90%

of Americans believe it's important that utilities and power companies protect water resources.

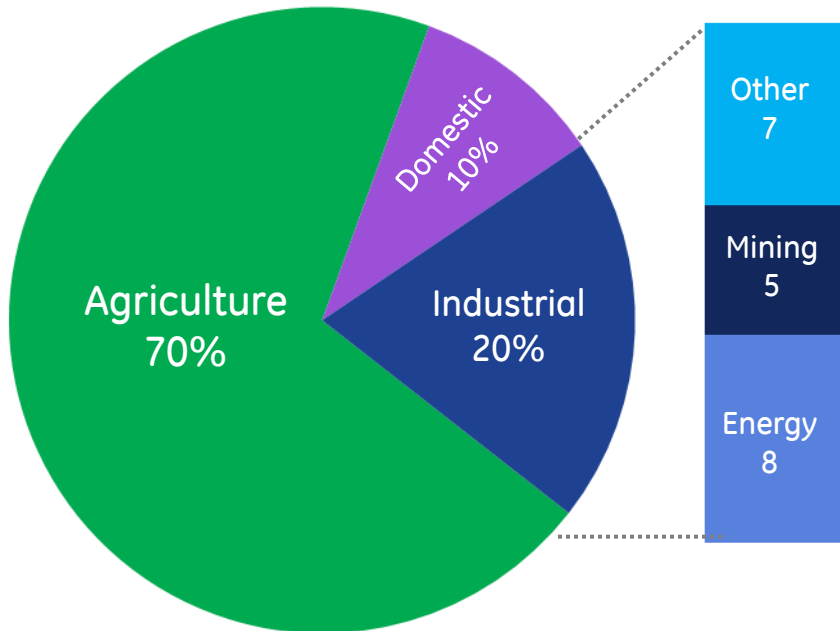
# 87%

of Americans are in favor of using recycled water for power generation, more than any other application.

# Demand on water resources

Agriculture dominates global withdrawals ...

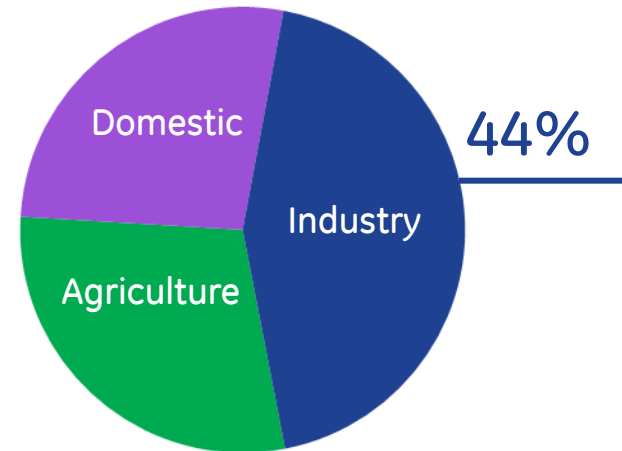
Global Water Withdrawals  
Percentage (%)



Source: Pacific Institute, The World's Water Vol 7  
<http://www.worldwater.org/data.html>

... But, industry dominates in advanced economies

Advanced Economies Water Withdrawals\*  
Percentage (%)



\* IMF definition for advanced economies

Developing economies are moving in the same direction

# Energy is water intensive

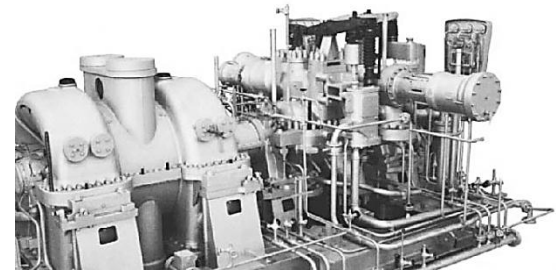
U.S. Domestic  
Per Capita Water Use



98

gals /cap/day

U.S. Power Sector's  
Per Capita Water Use



vs.

560

gals /cap/day

Sources: EIA, US Census, USGS

Power sector's water requirements are 6x  
greater than current domestic usage



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The International Society for Water Solutions (ISWS) provides a forum for communication and networking among engineers and scientists who share interests in water research and water technology development.

**Membership benefits include:**

1. A professional network allowing you to share ideas and experiences with your colleagues from around the world.
2. A platform for individuals to present their work and peer review projects relevant to industry and academia.
3. Discounts on ISWS water conferences and workshops.
4. News that is relevant and contains “what you need to know” to stay current.
5. Webinars, available live and on-demand, featuring cutting-edge water technologies covered by leading experts.
6. Access to career and employment services.



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# Leadership and Sponsors



**Danny Reible**, Bettie Margaret Smith Chair of Environmental Health Engineering, The University of Texas at Austin, Chair ISWS



**Ralph Exton**, Chief Marketing Officer, GE Power & Water, Co-Chair ISWS



GE Power & Water  
Water & Process Technologies





# 2013 ISWS Workshop Series



## Industrial Water Use and Reuse

April 30th- May 2nd, 2013

Grand Hyatt, San Antonio, Texas



## Municipal Water Reuse

September 23rd-25th, 2013

Hyatt Regency Long Beach, Long Beach, California



## Water Energy Nexus

October 20th-24th, 2013

Hilton Alexandria Old Town, Alexandria, Virginia



Thanks to a generous grant from the [United Engineering Foundation](#), the American Institute of Chemical Engineers, in conjunction with AIME and ASCE, will present a series of 3 workshops in 2013. Learn more about them [here](#). The United Engineering Foundation does not endorse results or recommendations from these workshops.

# NSF Energy-Water Nexus Workshop

June 10-11, 2013

National Science Foundation Headquarters  
Alexandria, Virginia



# Keynote Address



## Amanda Brock CEO, Water Standard

Named one of the top 10 women in energy by the Houston Chronicle, Amanda has spent her career as a leader and pioneer in energy and water related businesses.

In 2007, she helped develop WATER STANDARD, and in March 2008, Ms. Brock raised one of the largest equity commitments for a start up in the water industry to globalize its business.

WATER STANDARD is now recognized as an industry leader in water treatment for water-based enhanced oil recovery and produced water treatment/reuse.

In 2012, Global Water Intelligence described WATER STANDARD as the company "doing the most to bridge the gap between the oil and the water industries."



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Thank you

# Back up slides

# Water & Process Technologies

Aligning the best people with the most advanced technology, products and services to solve any water or process challenge our customers may have

## Quick Facts

- Headquartered in Trevose, PA, USA
- 8,000 employees globally
- 50,000 customers in 130 countries
- 50 global manufacturing sites





# Expertise and innovation

## Acquisition

- **1999:** Glegg Water Conditioning
- **2002:** BetzDearborn
- **2003:** Osmonics, Inc.
- **2005:** Ionics
- **2006:** ZENON Environmental

## Innovation

- **2007:** GE launches TrueSense
- **2008:** GE launches GenGard
- **2009:** GE launches the Muni.Z depth filter using Z.Plex technology, PROPAK system, and ZeeWeed 1500
- **2010:** GE launches Mobile Evaporator, Mobile M-PAK, HERO and ZCore
- **2011:** GE launches LEAPmbr and SeaPAK

## Expansion

- **2009:** The GE/NUS Singapore Technology Center opens
- **2009:** GE opens Water & Process Technology Center in Saudi Arabia
- **2011:** Wuxi plant expansion doubles capacity of water technology manufacturing in China
- **2011-12:** Tripled capacity at Oroszlány, Hungary production site
- **2012:** Opening of new laboratory in Cotia, Brazil

**Built on more than 85 years of domain expertise and innovation**

# Global leadership position

## Our leadership in equipment solutions:

- Advanced ultrafiltration, membrane bioreactor, reverse osmosis membranes and membrane chemistries
- Mobile fleet and water outsourcing capabilities
- Tough-to-treat applications, such as unconventional fuels and mining
- Packaged water treatment equipment
- Analytical instruments for measuring water quality



## Our leadership in chemical and knowledge management solutions:

- Cooling and boiler water technologies that enable customers to protect their assets
- Chemical treatment for ethylene, styrene and elastomer production facilities
- Refinery treatment solutions focused on tough-to-treat crudes
- Remote monitoring and diagnostic solutions



# Broad product and solutions portfolio

## Chemical & Monitoring Solutions



- Cooling Chemistries
- Boiler Chemistries
- Wastewater Chemistries
- Fuel Oil Treatment
- Hydrocarbon Process Chemistries
- Industrial Process Chemistries
- Knowledge Management & Monitoring Solutions

## Engineered Systems



- Ultrafiltration/Membrane Bioreactor
- Mobile Water Solutions
- Water Outsourcing
- Thermal/Zero Liquid Discharge
- Reverse Osmosis/Electrolytic Systems
- Filters & Membranes
- ABMet for selenium removal
- Analytical Instruments