

# International Society for Water Solutions

## Regulations Driving Reuse

GE Power and Water

Water & Process Technologies

**May 1, 2013**

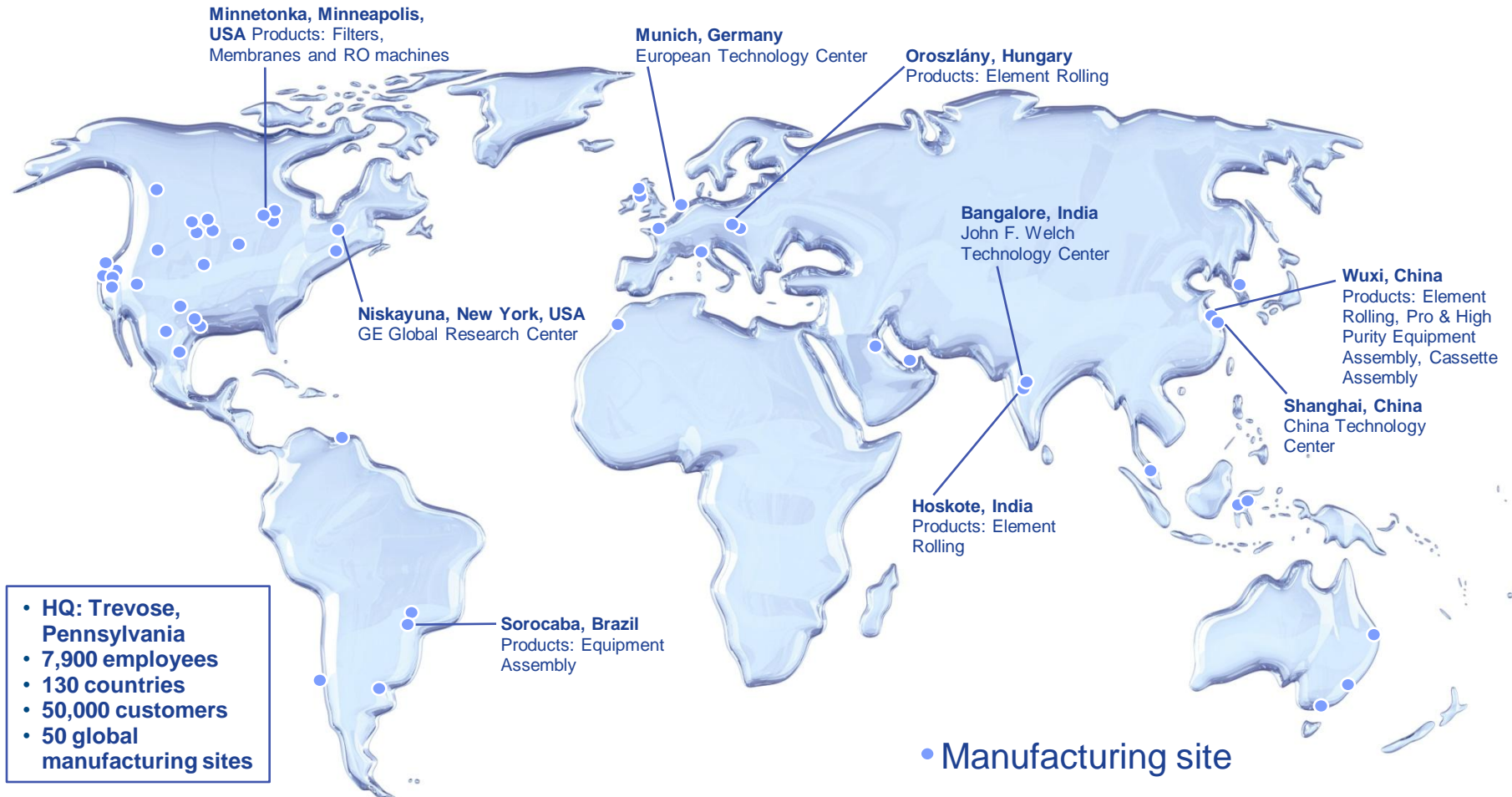


**Jon Freedman**



imagination at work

# GE Water is a global leader



**8,000 employees & 50,000 customers  
in 130 countries**



imagination at work

# And a broad portfolio of solutions

## Desalination Solutions:

Drawing on the ocean's virtually limitless water resources, GE's desalination technologies are helping water scarce regions to create new freshwater sources that can quench growing demand.

## Municipal Solutions:

Facing unprecedented growth and water demand, cities are turning to GE's advanced membrane and water quality measurement technologies to tackle increasingly stringent water and wastewater regulations and the threat of new, virulent pathogens in our lakes and rivers.

## Product Water:

Consumers use the products they trust – whether it is pharmaceuticals, food, or beverages. As brands expand globally, GE technologies ensure high quality ingredient water for manufacturing regardless of a plant's location or its water source.

## Utility Solutions:

GE is optimizing system efficiency & increasing uptime in cooling towers and boilers by reducing energy usage and greenhouse gas emissions. Advanced monitoring systems reduce the risk of pathogen growth, such as Legionella, in cooling systems.

## Process Chemicals & Separations:

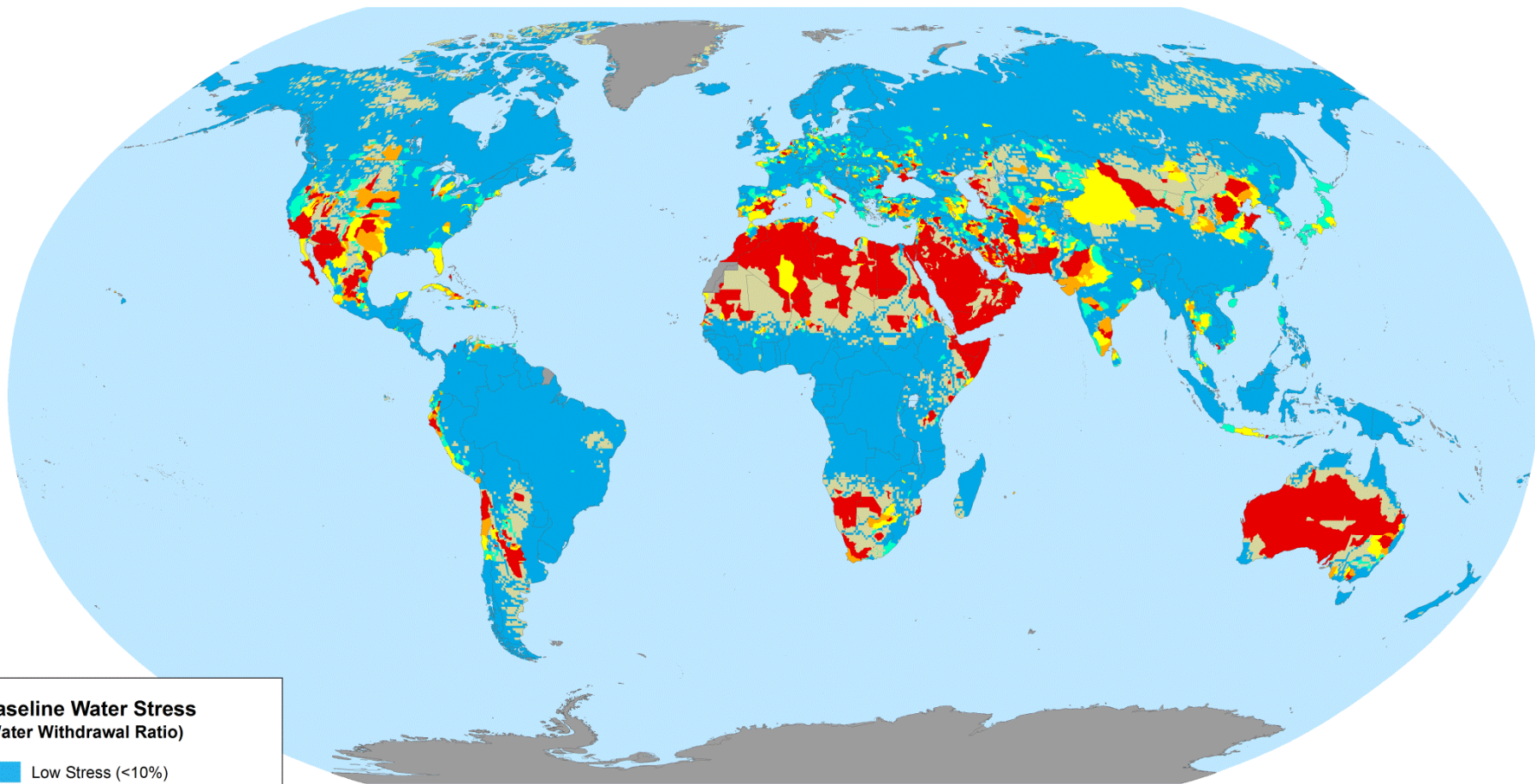
Silently working in pipes, tanks and process fluids, GE's advanced chemicals protect valuable production assets from corrosion and fouling faced in day-to-day operations, while improving overall manufacturing efficiency and quality.

## Industrial Wastewater:

Once considered a by-product, GE's water reuse technology is transforming industrial wastewater into a sustainable, new water source that can often be used many times over—dramatically reducing the strain on our precious water resources.



# GE-Goldman Sachs-WRI Water Risk Atlas



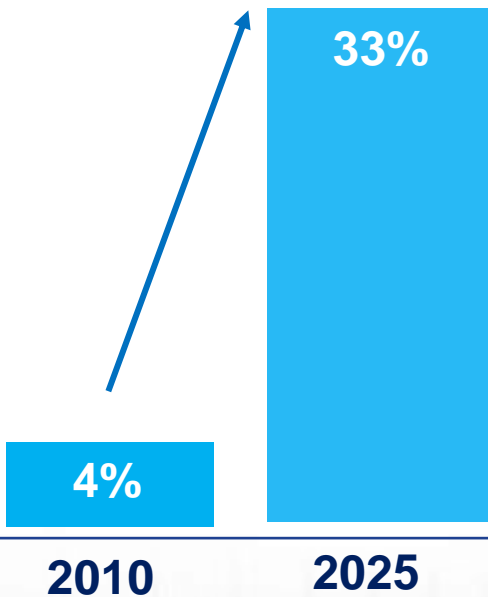
## Baseline Water Stress (Water Withdrawal Ratio)

- Low Stress (<10%)
- Moderate Stress (10-20%)
- Medium-High Stress (20-40%)
- High Stress (40-80%)
- Extremely High Stress (>80%)
- No Data / Out of Area
- Arid & Low Water Use

*Data Provided Courtesy of The Coca-Cola Company*

# Reuse is policy driven globally

Reuse growth over next 15 years ...



Global Treated Wastewater  
% Reused

## Water scarce countries taking action



Israel

85% reuse today... 90% by 2016



Saudi Arabia

11% reuse today... 65% by 2016



Spain

11% reuse today... 40% by 2015



China

14% reuse today... 25% by 2015



Australia

4% reuse today... 30% by 2015



India

<1% reuse today... 5% by 2016

Note: Egypt 32%, Singapore 35%, Kuwait 91%  
Source: GWI

# Global reuse regulatory drivers



- 90% recycle in oil sands



- Nutrient removal
- EPA frack water rule (2014)
- Selenium/mercury limits (2013)



- 2011 drinking water reg . . . UF



- Strict 2009 mining regs; comply by 2014



- 12<sup>th</sup> five-year plan mandates reuse
- Coal-to-chemicals



- Industrial reuse standards (2014)
- Pharma by-products (2014)
- Full-cost pricing (2015)



- **KSA 11% reuse . . . 65% by 2016**



- **Qatar brine discharge 2016 . . ZLD**



- Stricter mine drainage regs (2013)



- Queensland & NSW ban evapo ponds & drive reuse

**Regulations driving reuse globally**



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# Water reuse legislation - 2013



- SRF Funding
- **Private Activity Bonds**
- Alternative Water Sources Act (\$125/year for 3 years for Desal & Reuse)
- **10% Renewable Water Target**
- Climate Change & Resilience . . . Sandy Relief
- Investment Tax Credits for Reuse
- **WIFIA**





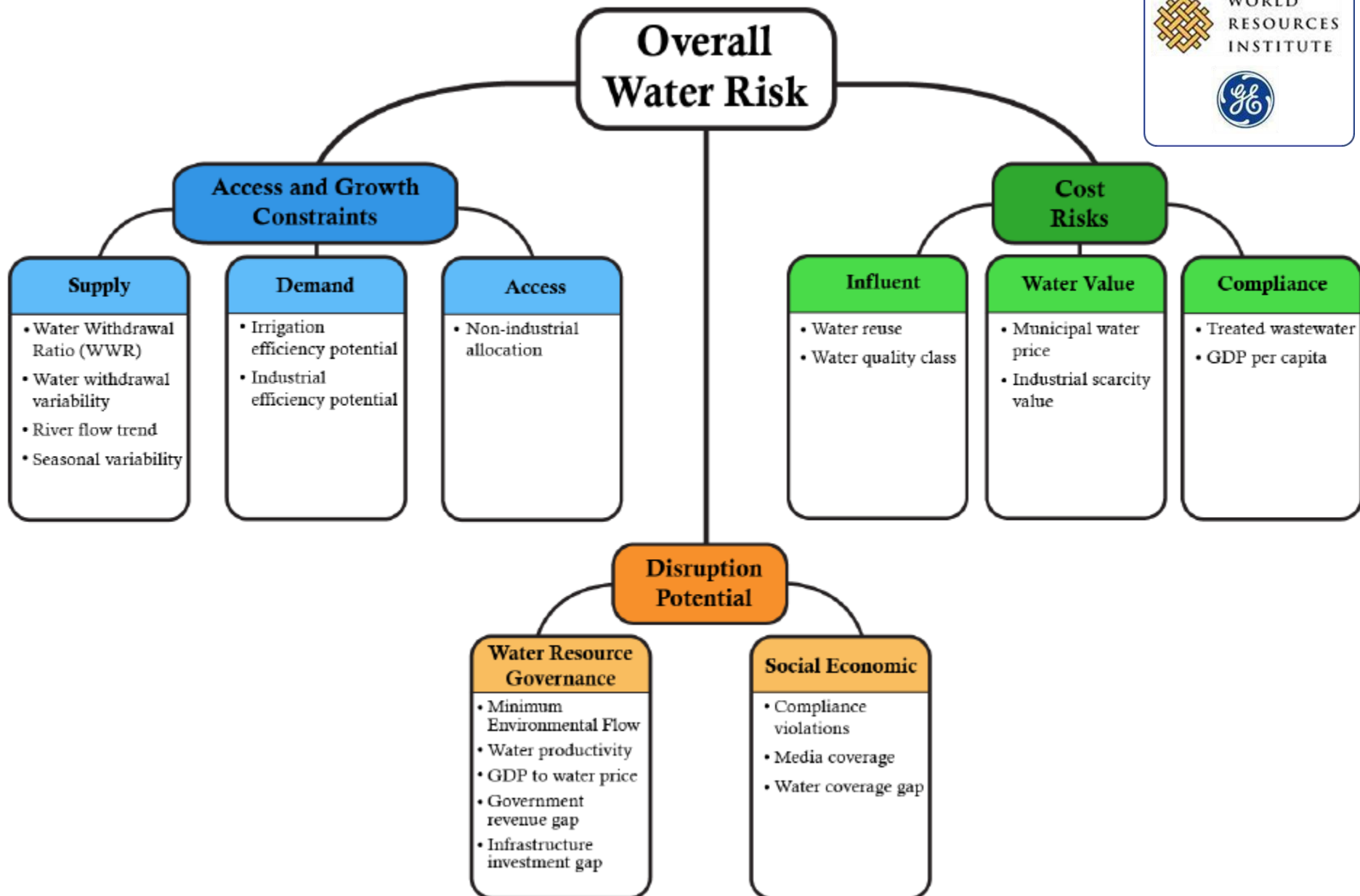
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# Aqueduct: Water Risk Index

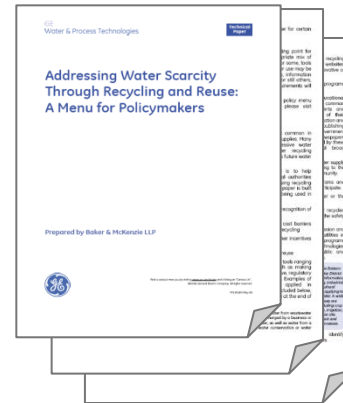
Goldman Sachs



WORLD  
RESOURCES  
INSTITUTE



# Global thought leader on reuse



- Global White Paper promoting greater reuse
- “A menu for policy makers”
- Downloaded >40,000 times

## 2011 Saudi Reuse Summit

