Strategic Analysis of Water Markets of the USA & World

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"Fresh water is poised to be the world's new oil, and this (Milwaukee) region is perfectly located to lead the effort in freshwater sciences - and cash in on any commercial opportunities."

-- Milwaukee Journal Sentinel Editorial, January 11, 2009

Problems? Let's See:

- **Water increasingly in news**
  - **Flooding in Northeast and Gulf states; Pakistan, Australia, etc.**
  - **Draught in GA, NV, CA, TX, & 32 others**
  - **Contamination: China, India, Africa, Middle East, Japan, and several states**

Some places seemingly have lots of water

- **US average daily water consumption is: 160 gallons per person**
- **Tens of millions elsewhere live on 3 gallons per person per day**

World's population is growing

- 20th Century population growth tripled
- Water consumption increased 6X
- By 2050 world population will grow by 50% or >3 billion persons
- Water demand will grow at least 2X again

The Basic Issue

- **Supply v. Demand**
  - **Same water is available today as was available billions of years ago**
  - **Demand growing far faster than supply**
  - **By 2030 water use will be 40% greater than current accessible, reliable supply (w/no Δ)**

World Challenges

- **Common challenges:**
  - **Insufficient Water Quantity/Quality**
  - **Available water not near water demand**
  - **Insufficient Wastewater Treatment**
  - **Rising energy costs**
  - **Water policies not match changing needs**
  - **Insufficient money allocated to addressing water needs**

World Challenges

Many and growing problems with:

- **increased demand for water**
- **growing shortages of water (due to abuse)**
- **inadequate delivery systems in many places**

Water Opportunities: Markets

- **Global Market 2010: $483B**
- **U.S. Market 2010: $107B**
  - **Growing 10.0%-14.9% 2010-2016**
  - **China: $47B, growing 6.0-9.9%**

Fastest Growing Markets (2010-2016)

- **Spain: $11B, >15%/year**

Others 10-14.9%/year

- **U.S.: $107B**
- **Italy: $16B**
- **Brazil: $15B**
- **India, UAE, Iran, Indonesia, Malaysia, Morocco**
- Source: Global Water Intelligence

U.S. Challenges

- **Common problems include:**
  - **Aging water & wastewater infrastructure**
  - **Unsustainably high levels of water use**
  - **Ag, mining, & urban contamination of water**
  - **Stormwater runoff, contamination, flooding, CSOs**
  - **Specific contamination sources: CAFOs, Fracking, Sediments**
  - **Invasive species**
  - **Making reclaimed water acceptable**

U.S. Challenges – Cont.

- **Water demand growing**
- **Location of demand shifting (50% of US growth will be CA, TX, FL – already with water challenges)**
- **600 ft drop in Waukesha aquifer; 150ft drop in some portions of the Ogallala Aquifer**
- **Supplies are being polluted, overused, & wasted**
- **Rain falls in different places and quantities**

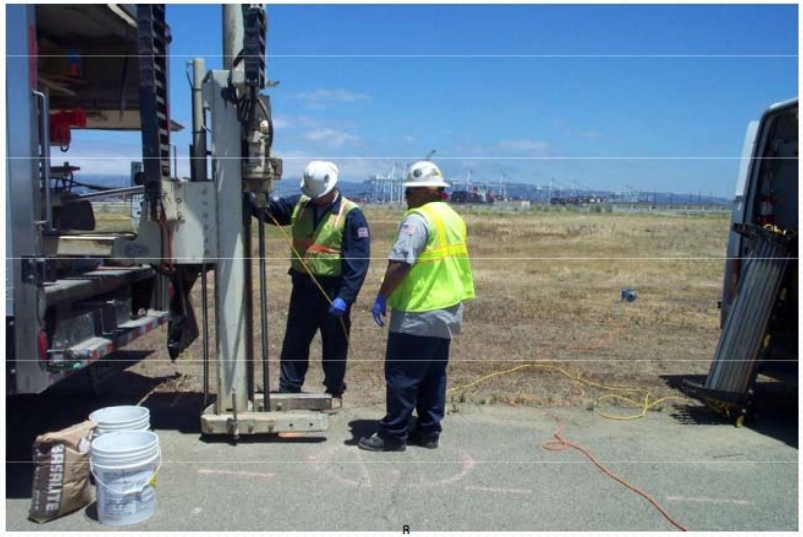
Flooding of the Susquehanna in Sept. 2011

U.S.: Opportunities

- **Common Solutions for U.S. Markets:**
  - **Energy efficient operations**
  - **Water efficient products & processes**
  - **Real-time sensing, ground & surface water**
  - **Efficient WWT to capture P & energy**
  - **Energy efficient desalination**
  - **Storm water containment, control, decontamination**

Examples of Select U.S. market Opportunities

- **Water & Wastewater Infrastructure, Monitoring, Upgrades, replacement: CA, FL, IA, NY, PA, WA**
- **Ground water contamination: metering & monitoring in CA, Fl, MN, PA, WA, WY**



Examples of Select U.S. market Opportunities

- **Water Conservation/Efficiency: CA, FL, IA, MN, TX, WA**
- **Agriculture: Concentrated Animal Feed Operations (CAFOs): in states CA, FL, IA, MD, TX, WI**

Examples of Select U.S. market Opportunities

- **On-site natural gas exploration, especially Hydro-fracking: 31 states**
- **Watch CA and Chesapeake Bay (NY, PA, DL, MD, VA) for the future**

Wisconsin: Challenges

- **Challenges in SE Wisconsin:**
  - **Shortages in some communities**
  - **Deep aquifer reliance**
  - **Storm water runoff: flooding, contamination**
  - **Pollutants: PPCPs, FR, Phosphorous, etc.**
  - **Invasive Species**
  - **Leaky Infrastructure: S. MKE; I&I; mis- and un-connected sewer pipes**
  - **WWT Standards – stringency & enforcement**
  - **Over 40 total**

Wisconsin: Opportunities

- **Agriculture**
  - **Reduced Phosphorus fertilization methods;**
  - **Phosphorus control mechanisms;**
  - **Treatment/reuse methods (digesters) for animal waste from CAFOs;**
  - **Monitoring technology**
- **Wastewater Treatment**
  - **Pharmaceutical removal technologies;**
  - **More effective phosphate removal/harvesting technologies;**
  - **Utilization of sewage sludge**

Wisconsin: Opportunities (cont.)

- **Nitrate/phosphate Contamination**
  - **More tightly incorporating nutrient recovery technologies into waste treatment processes;**
  - **Alternatives corrosion control mechanisms for pipes in homes (to prevent copper and lead leaching)**
- **Invasive Species**
  - **Technology facilitating removal of invasive species from ship hulls;**
  - **Ballast water disinfection technologies;**
  - **Technologies inhibiting spread of invasive species between bodies of water (biological, electrical, mechanical barriers, etc.)**

New Technology Initiatives

- **IURC - supports eight researchers at UWM and MU**
- **UWM – Bradley Catalyst grants for water-related technology**
  - **Dr. Peter Geissinger**
    - **Fiber optic sensor system for water quality monitoring**
  - **Zhen (Jason) He**
    - **Development of microbial fuel cell for production of energy from wastewater**

Who's already in Ozaukee?

ChemIndustrial Systems, Inc.	Process design and liquid handling
Dehumidifier Corp. of America	Commercial dehumidifiers
Scot Pump	End suction centrifugal pumps
Weil Pump Co., Inc.	Wastewater, vertical & submersible pumps
Mardon Control Systems, Inc.	Water quality monitoring instrumentation
Air Engineering, Inc.	Compressor, filtration and pump parts
Bonestroo	Engineering, planning and environmental services
R.A. Bruner Company	Water conditioning, filtering and purification
Aquarius Technologies, Inc.	Wastewater treatment
Jadair International	Concrete reclamation and water recycling systems

Aquarius Technologies

- **Port Washington, WI**
- **No waste sludge MSABP activated biological treatment system**
- **ELCAT system for toxic and non-biodegradable waste streams**
- **Diffused aeration technology**

AQUARIUS
TECHNOLOGIES, INC.

Incubators

Water Council water business incubator – Milwaukee's Fifth Ward

Feds see potential:

- **Grants awarded to Water Council and several area universities:**
  - **NSF for training**
  - **EDA for commercialization (2)**

There is a future in water

- **There is no future without water**

- ***Questions?***