

# **Foresight Nanotech Conference**

**Nanotech for Clean Water**

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# McGOVERN CAPITAL LLC

**Global innovation through alliances.**

**IP Strategist:** Disruptive / Platform  
Technologies

***"Catch the Current"***®

**Relationships:** Entrepreneurs,  
Corporations, Universities and Governments

# McGOVERN CAPITAL LLC

## NANOTECHNOLOGY NOW ...

- **ANGSTROM PUBLISHING -- JV with FORBES**
  - The Forbes/Wolfe Nanotech Report
  - Leading Nanotechnology Research and Newsletter
- **WATER TECHNOLOGY**
  - Patented, microbiological water filter technology designed to defeat one of the world's greatest killers: Water-Born Diseases (WBD)
- **NANO-FIBER TECHNOLOGY PORTFOLIO** - broad applications in many industries worldwide / negotiating joint ventures
- **AQUEA SCIENTIFIC:** Micron / Nano encapsulated "wash on" additives

# Nanotech & Water...

## *EVOLUTIONARY AND REVOLUTIONARY SUCCESS*

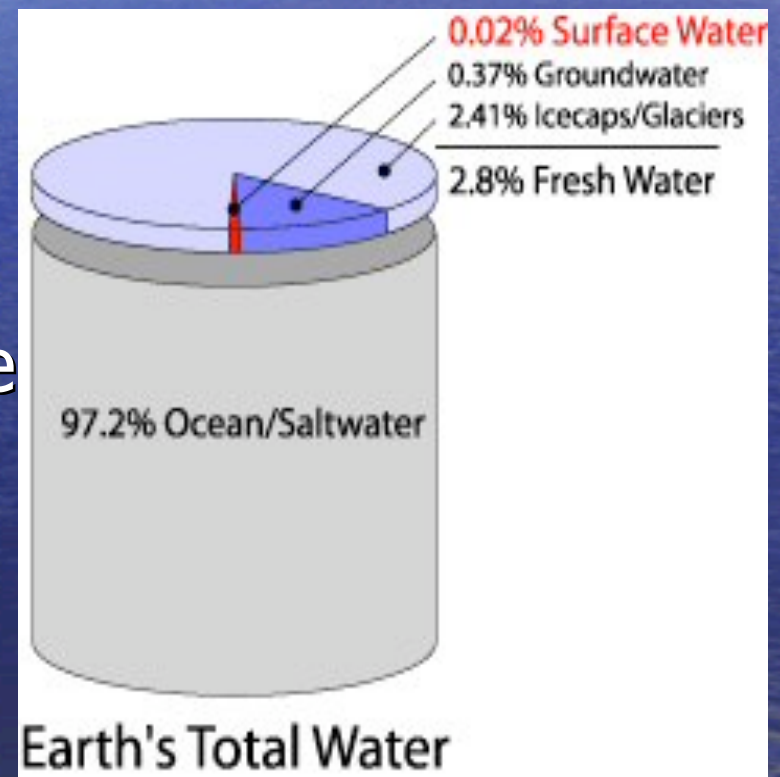
- Nanotechnology's solutions to the world's water issues are both **EVOLUTIONARY AND REVOLUTIONARY**
- **HOW BIG IS THE GLOBAL WATER MARKET?**

# GLOBAL WATER MARKET

- Water is a **\$400 billion global business**
- Demand for drinking water is expected to **grow another 40% by 2025**
- Global consumption of water is **doubling every 20 years**, more than twice the rate of human population growth
- According to the United Nations, **1.3 billion** people already lack access to "safe" drinking water

# GLOBAL WATER MARKET

- More than **97%** of the world's water reserves are salt water, contained in the Earth's oceans
- Just a small proportion of the **1.3 billion** square kilometers that make up the world's water reserves is fresh water
- Only **0.4%** of those reserves is accessible

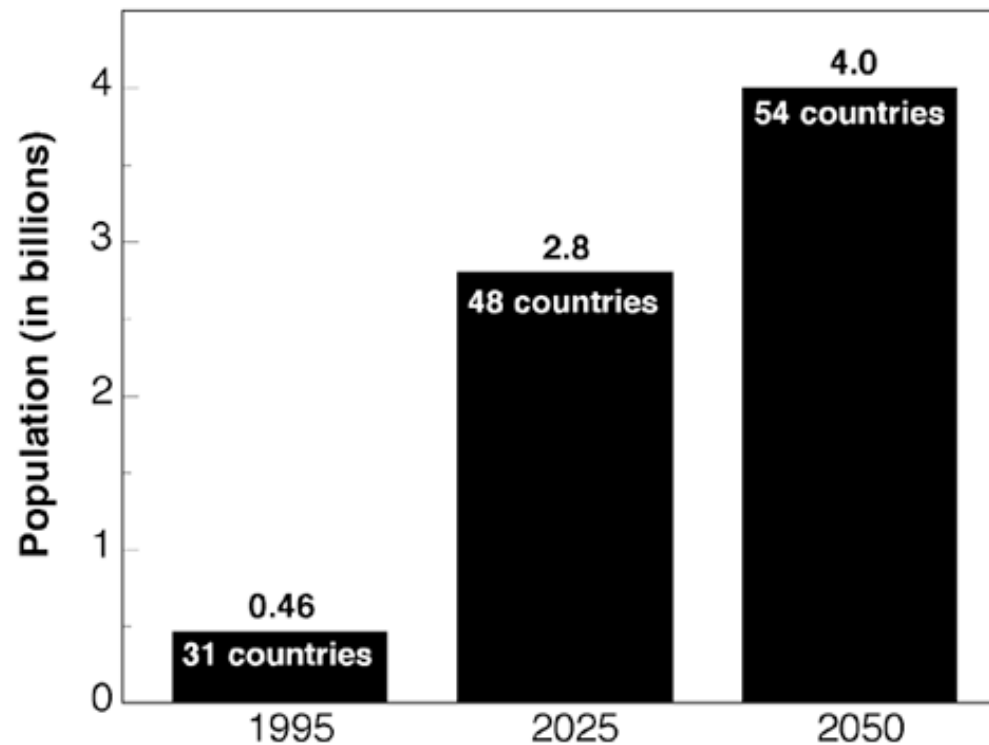


Source: [www.forestinfo.org](http://www.forestinfo.org)

# Water Scarcity and Stress

**Figure 5. Water Scarcity and Stress**

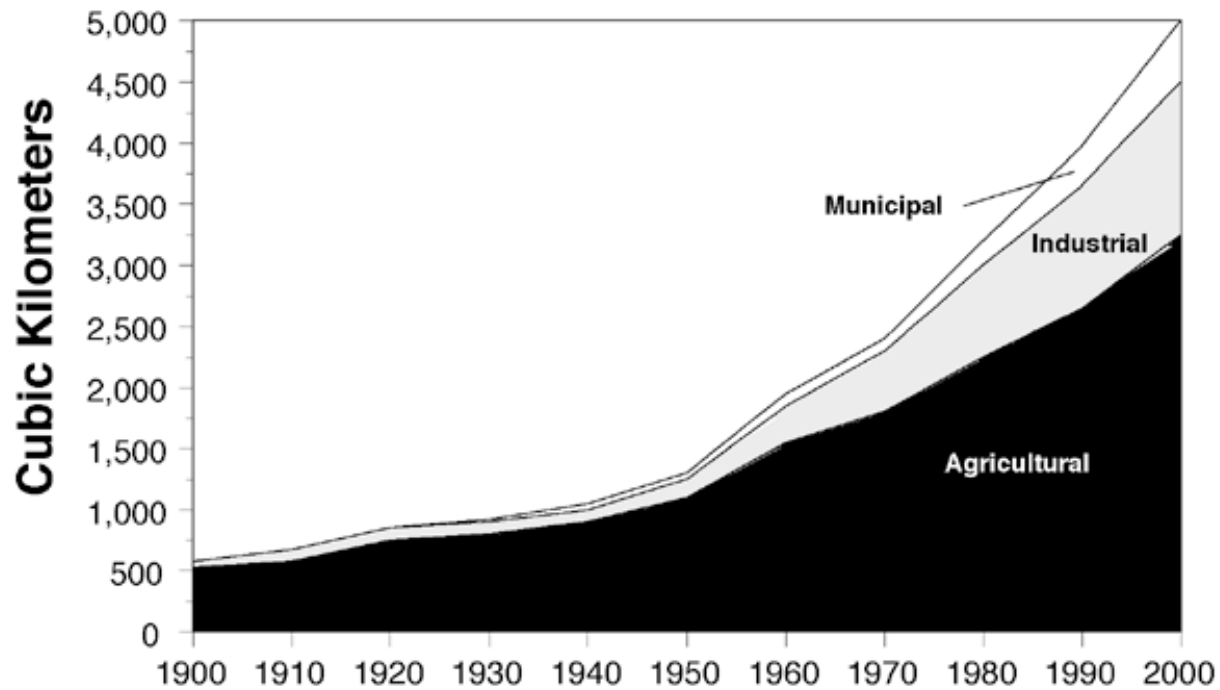
Population in water-scarce and water-stressed countries, 1995-2050



# Water Use

**Figure 4. Rising Water Use**

Global Annual Water Withdrawal by Sector, 1900–2000



Source: Abramovitz 1996 (1)



# Conflicts

- In 1985 Dr. Boutros Ghali famously said that "the **next war** in the Middle East will be fought over **water, not politics**"
- "If the **wars** of this century were **fought over oil**, the **wars** of the next century will be **fought over water**." Ismail Serageldin, former vice president for sustainable development at the World Bank.

# Results of Lack of Water

- Water-related diseases kill millions of people each year, prevent millions more from leading healthy lives, and undermine development efforts. About **2.3 billion** people in the world suffer from diseases that are linked to water.
- An estimated **3 billion** people lack a sanitary toilet
- An estimated **4 billion** cases of diarrheal disease occur every year, causing **3 million** to **4 million** deaths, mostly among children

# Results of Lack of Water

- Some **6,000** children die every day from diseases associated with lack of access to safe drinking water, inadequate sanitation and poor hygiene – equivalent to **20** jumbo jets crashing every day.
- In Zambia, **one** in **five** children die before their fifth birthday. In contrast in the UK fewer than **1%** of children die before they reach the age of **five**.

# Results of Lack of Water

- At any one time it is estimated that **half of the world's hospital beds** are occupied by patients suffering from water-borne diseases.

# Types of Pollutants

- **Particulate matter** – particles of minerals and organic material that cause turbidity in water.
- **Chemical pollutants** – includes pesticides and industrial wastes dissolved in solution
- **Disease causing agents** – bacteria, virus' and parasitic organisms.
- **Truly safe drinking water must address all three of these categories.**

# Water Treatment Methods

- **Boiling:** Effective when done properly. **Ineffective** against **particulate** matter and **chemical** pollutants, expensive and energy intensive.
- **Chemical Disinfection:** Effective against most pathogens. Some pathogens resistant. Environmental and end-user risks. **Ineffective** against **chemical** pollutants.
- **Solar:** Simple and low-cost. May be **ineffective** against certain **pathogens** or through turbid water. **Ineffective** against **chemical** pollutants.

# Water Treatment Methods

- **Filtration Devices:** Vary greatly depending upon pore size and composition. Can be very effective against particulate matter and chemical pollutants. **Traditionally ineffective** against many **pathogens**.
- **UV:** Effective against many pathogens but perceived as complicated and expensive. **Ineffective** against **particulate** matter and **chemical** pollutants.

# Water Solution: Product Issues

- Filter: Bacteria and Virus'
- Gravity Flow / Point of Use
- Flow Rate
- Separation / Elimination
- Durability
- Security / Knock-Offs
- Price
- Commercial Feasibility



# Water Solution: Distribution Issues

- Base of the Pyramid
- Pilots / Pyramid of Influence
- Channels of Distribution
  - Private Enterprise / JV
  - NGO's
  - Government
- Demographic Considerations
  - Geographic Homogeneity
  - Middle Class
  - Urban vs. Rural

# Future of NanoWater

- **International Phenomenon**
- **Evolutionary and Revolutionary**
- **Alliances are Key**