singapore sessions

CHALLENGE QUESTION
How can we harness cost-effective yet sustainable urban water solutions to address the growing urbanization trend?

SOLVING THE GLOBAL WATER CRISIS
LEADING EXPERTS PROPOSE SMART SOLUTIONS

Urbanization brings with it a perfect storm of conditions that contribute to the looming water crisis. Depleting natural resources for freshwater. Dramatic population growth in urban areas, including 'megacities' in emerging economies like India and Brazil. Poor water management and a lack of infrastructure or investment. Despite these realities, today's smart thinkers, new innovations and a collective, global motivation can help turn the tides.

This month's **Singapore Session**, part of an initiative designed to explore diverse solutions possible for any given challenge, brings together experts in diverse fields to share their **ideas for sustainable urban water solutions that if implemented today, have the potential to affect major change in municipalities across the world, both in the near and the long term**.

VAL S. FRENKEL

Ph.D., P.E., D.WRE.,
Director Membrane Technologies with Kennedy/Jenks Consultants

Smart Water Use and Reuse

Val Frenkel, Director Membrane Technologies with Kennedy/Jenks Consultants, is the company-wide leader for Membrane Technologies. Dr. Frenkel formed and leads the firm's Membrane Technology Group and has 25 years of experience in engineering, with expertise in water and wastewater treatment, water reuse, and membrane technologies, including desalination.

PROPOSAL: Optimize the way water is supplied and reused to ease the increased demand for clean water in urban areas.

There are two potential solutions to the challenge. The first involves increasing efficiency of water delivery based on usage. Currently, the demand for clean drinking water is a relatively small fraction of the overall water demand. By splitting the water supply utilizing a dual-piping system based on usage purpose, clean drinking water can be allocated where it's needed, and additional water is supplied where agriculture and industry demand exists. This would ensure that the clean drinking water available is not wasted.

The second solution centers on water reuse. Water reuse is quickly becoming a popular concept for providing additional water supply to affected areas. Innovations in membrane technologies, in particular Membrane Bioreactor (MBR) processes that filter out micro-organisms during wastewater treatment, allow for the development of decentralized plants making localized treatment available at places like parks and industrial facilities. This process helps with reducing and avoiding pumping of water over long distances, and also saves time and energy.

What do you think? To comment on the solutions you see here, visit **SingaporeSessions.com/Water**

PROFESSOR ASIT K. BISWAS

Run Water Supply Like a Corporation

Founder and President, Third World Centre for Water Management

Prof. Asit K. Biswas is now universally acknowledged to be one of the world's leading authorities on water management. He is the Founder and President of the Third World Centre for Water Management in Mexico, and Distinguished Visiting Professor at the Lee Kuan Yew School for Public Policy in Singapore. He has been a senior advisor to 18 governments, six Heads of the United Agencies, Secretary General of OECD and NATO. Among his numerous awards are the Stockholm Water Prize, considered to be the equivalent of a Nobel Prize in water. He has authored also 81 books, and his works have been translated into 33 languages.

PROPOSAL: Manage water demand and delivery like a CEO—with solid leadership, applied best practices, and efficiency in operations.

There are no physical, technical or economic reasons why urban centers cannot benefit from a continuous supply of clean drinking water, except for poor water management. Both Phnom Penh and Singapore are good examples of how leadership and efficient water governance have ensured a 24-hour clean water supply. Phnom Penh Water Supply reduced its unaccounted-for water losses from 73% to 6% within a decade (a performance better than London, Paris or Los Angeles). The associated operation and maintenance costs were subsidized entirely by consumers.

These improved payment methods, coupled with the replacement and restructuring of top management, both eliminated corruption and increased profits—a strong indication that results are achievable in any country with access to managerial and technical talent.

"Results are achievable in any country with access to managerial and technical talent."

DR. SHANE SNYDER

Reclaim Wastewater

Professor, University of Arizona and R&D Project Manager, Southern Nevada Water Authority

Dr. Shane Snyder is a professor in the College of Engineering at the University of Arizona. He is also the co-director of the Arizona Laboratory for Emerging Contaminants (ALEC). For over 15 years, Dr. Snyder's research has focused on the identification, fate, and health relevance of emerging water pollutants. In 1998, he was credited with the first discovery of natural and synthetic estrogens in North American waters. In 2000, Dr. Snyder became the R&D Project Manager at the Southern Nevada Water Authority's Applied R&D Center (ARDC).

PROPOSAL: Augment water supply and protect the environment by reducing water contamination caused by agriculture.

Water reuse, which is the use of wastewater for supply augmentation and irrigation, has the greatest potential for increasing water sustainability. There are tremendous advantages to reclaiming and reutilizing wastewater effluents as an alternative to discharging this water into oceans and inland rivers. Decentralized reuse plants now enable treatment of wastewater to potable standards close to the source. Ocean desalination is expensive, mostly due to the cost of energy required to pump and transport the water. The cost for actual water treatment is relatively minute, and the treatment of wastewater is not energy intensive. This localized technology, in addition to the benefits to sensitive ecosystems disrupted by current wastewater discharge, make water reuse a viable solution to our challenge.

"There are tremendous advantages to reclaiming and reutilizing wastewater effluents."

Harness Technology

OLIVIA LUM

Group CEO and President of Hyflux

Olivia Lum is the Group CEO and President of Hyflux, a leading provider of integrated water management and environmental solutions with operations and projects in Singapore, Southeast Asia, China, India, Algeria, the Middle East and North Africa. The company's landmark projects include Singapore's first water reclamation plant, the Bedok NEWater Plant; Singapore's first seawater desalination plant and first Public Private Partnership, SingSpring Desalination Plant at Tuas; China's largest desalination plant in Tianjin; and the world's largest membrane-based seawater desalination plant in Magtaa, Algeria.

PROPOSAL: Leverage technological breakthroughs on a large scale.

Urban communities will have to seek innovative solutions to their water supply needs by leveraging advances in technology to tap into non-traditional sources of water. Increasingly, membrane technology has proven to be cost-effective for seawater desalination, used water treatment and recycling. The adoption of membrane systems also yields other environmental benefits, such as energy efficiency, lower use of chemicals in the treatment process and a smaller footprint required for the plant.

> "Membrane technology has proven to be cost-effective for seawater desalination, used water treatment and recycling."

For example, Hyflux's Kristal® polymer hollow fibre membrane has applications in the treatment of aqua-based industrial waste streams, water purification, wastewater recycling, and seawater desalination. Kristal® is widely used in the pre-treatment ultrafiltration stage of Hyflux's landmark desalination projects in China and the Middle East & North Africa region, including the Tianjin Dagang and Magtaa desalination plants.