WORLD MATERIALS FORUM

WMF 2019 – KEY TAKE AWAYS

OPENING DEBATE: SMART MATERIALS FOR WATER MANAGEMENT

A. PROBLEM STATEMENT

- There is a water crisis happening right now. Climate change and increasing urbanization mean that many countries and communities are suffering from severe water stress while, concurrently, other areas have too much water caused by extreme rainfall events leading to flooding and overcoming sewer and water treatment infrastructure.
- Current water infrastructure is, in many countries, inadequate. Water loss is excessive (~30% in developed countries; >50% in developing countries). Clean water and adequate sanitation is lacking in many developing countries and water is increasingly becoming unaffordable.
- As the world population heads towards eight billion, the cost of building or replacing infrastructure to handle current and future needs using conventional strategies is unsustainable. Smarter materials and methods are needed in order to solve this dilemma.

B. CURRENT STATUS OF EVOLUTION OF SMART MATERIALS AND STRATEGIES

- Smart strategies are currently being deployed by major players in the water sector to address water loss reduction and improve water network management. This includes the deployment of sensor networks to detect real-time leakage or mains failure so that early action can minimize water loss.
- The development of advanced monitoring and condition assessment technologies, combined with artificial intelligence and predictive analytics, means that unnecessary infrastructure replacement can be avoided and resources can be efficiently deployed to where they are most needed. Several case studies demonstrate the viability and success of these strategies.
- The development of advanced membrane technologies is leading to water treatment with significant energy savings and lower cost.
- Private capital is available for innovators to develop new materials and solutions and there are existing examples of how to accelerate the evolution of ideas from academic research to commercial deployment.

C. WHAT ARE THE FUTURE PROSPECTS FOR SOLVING THE WATER CRISIS FOR COMMUNITIES AND INDUSTRY?

- The greatest step change will likely come from major advances in water treatment technologies which will reduce the cost and energy consumption and improve the quality of water and sanitation for poor countries. Decentralization and commoditization of water treatment was proposed as a strategy for addressing the needs of urban and rural populations in developing countries.
- Continuing evolution of innovation in all aspects of the water cycle can be expected, leading to improved efficiencies and quality.
- Collaboration between and within industry, the public sector and capital markets will be needed to adequately address current and future needs.
- Enlightened public policy and regulatory frameworks that address all stakeholders priorities are necessary to achieve success.

CONCLUSION

The panel agrees that we can reduce worldwide water loss by 2/3 and energy costs by 50% by 2030 with increasing contribution from renewable energy if smart materials and strategies are widely deployed.

SPEAKERS

Jean-Louis Chaussade - CEO Suez (France) - Co Chair
Ilham Kadri - CEO Solvay (Belgium) - Co Chair
Amanda Gwyther - Vice President Water Treatment, Xylem Inc (USA
Peter Voigt - Founder CleanTeQ (Australia)
Moshe Kelner - CEO MemTech (Israël)
Helge Daebel - Director Emerald Technology Ventures (Switzerland)

Moderator: Jack Elliott, most recently CEO Puretech, Canada