Challenges of Wastewater Treatment Research for a Sustainable Future: Tailor-made and Energy Positive

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The basic concept of today's wastewater treatment in general dates back to the 19th and beginning of the 20th century. The waste water is still collected predominantly via central sewer systems and purified in central treatment plants. It is collected mainly via gravity sewers, which are sometimes over 100 years old and partly with pressurized pipes. Although technical components were further developed and made more efficient, the system comes to its limits in developed as well as underdeveloped areas – especially with respect to new and increasing environmental and economical challenges. Thus, a lot of countries in the world call for more efficient waste water management systems.

Two of the main challenges in the water sector are demographic and climate change, but also the increasing urbanization in many parts of the world, causing new infrastructural problems. The increasing trend to save water - economically or ecologically driven - makes it difficult in areas with declining population to maintain or achieve further increase of efficiency in the existing plants. Wastewater treatment plants up to recent times have been exclusively designed to eliminate loads of organic matter as well as environmentally and hygienically critical substances. On the other hand wastewater is an important resource, regarding materials and energy. The recovery of nutrients from wastewater and use of the energy potential should be seen as strategic objective for future developments.

Water production, water use and treatment of wastewater are in direct context to the current major challenges such as public health, climate protection, energy supply, and resource recovery. German companies and research institutions are among the top-ranking organizations in this area. Wastewater management and connected areas are an excellent opportunity for the environmental sector, also economically. Under a global perspective, there are substantial value creation potentials (Green Economy). Future markets are mainly in Asia, Africa and South America, as well as in the Central and Eastern Europe.

The workshop aims to discuss:

1. What are the bottlenecks in transferring of existing wastewater treatment concepts into other parts of the world?
2. Which options exist in terms of new technical developments and scales?

3. Can existing infrastructure evolve to meet the upcoming needs or are totally new approaches necessary in order to meet the future requirements?
4. Which other sectors should be included in wastewater management and treatment (e.g. organic waste management, energy, fertilizer industry, planning of water infrastructure and urban planning)?

Agenda

Roland Müller, Helmholtz Center for Environmental Research

Moderator

Ursula Schließmann, Institute for Interfacial Engineering and Biotechnology

Future wastewater treatment in Germany: challenges and concepts for a global market

Ruud Peeters, Energie fabriek

Waste water treatment in Europe: examples of energy and resource factory concepts

Matthias Barjenbruch, Technical University of Berlin

Wastewater treatment plants in warm and arid regions - challenges for today and the future