

Executive Summary

Water Treatment Report

THE BACKGROUND OF THE WATER QUALITY REPORT

This report on “Water Treatment” is based on the results of the FP6 project TECHNEAU

Worldwide the water supply sector is facing tremendous challenges. New emerging contaminants and pathogens pose a threat to the quality of water supplies as do aging infrastructures being vulnerable to both accidental and deliberate contamination. Shortage of both good and accidental quality and readily treatable resources is increasing due to global warming, urbanisation and pollution from agriculture and industry. Regulators and consumers are becoming more demanding.

TECHNEAU is addressing these challenges by developing adaptive supply system options and new and improved treatment and monitoring technologies. Future system options to be studied are flexible, small scale and multi-source supplies, utilising non conventional resources like brackish ground water, treated wastewater and urban groundwater. Treatment technologies include membrane and oxidation based multi-barrier schemes, providing safety against a broad spectrum of chemical and microbiological contaminants. Monitoring technologies to be developed will provide on-line and at the site information on water quality including parameters that relate to malicious contamination.. The project will integrate and further develop current work on modelling with the purpose of controlling and optimising supply systems. A framework for risk assessment/risk management will assist in integrating the project output into the practice of the water companies.

The project will enable end-users to make informed choices, appropriate to their own circumstances and constraints, for cost-effective and sustainable source-to-tap solutions for the provision of safe high quality drinking water that has the trust of the consumer. This step-change will be achieved by a critical mass of researchers, technology developers and users from across Europe and developing countries.

MAIN CHALLENGES IDENTIFIED ON THE REPORT

The main challenges identified for the water sector, with focus on water treatment, can be divided in three categories. the Membrane Technologies Working Group:

- Addressing newly emerging pollutants and pathogens
- Need to exploit new water resources: Climate change, urbanization and pollution increasingly force water utilities to look for less conventional resources such as seawater, brackish ground water and ‘used’ water



A Common Vision for Water Research and Innovation

- Improving energy efficiency and sustainability, To ensure efficient use of resources, the water sector wants to develop and implement more sustainable technologies, products and services This challenge is facing the competing trend of increasing energy use as a result of higher standards for water quality. The environmental impact has to be considered, without compromising water quality

RESEARCH GAPS FOUND

The broad membership of the TECHNEAU consortium, both disciplinary and geographically, has allowed focus on European relevant topics and on issues not yet taken on board in current institutional, national and European programmes.

The research gaps identified can be divided in four categories:

- Framework for evaluating risks, performance, sustainability and costs. Regarding the regulatory constraints, the design of bio-indicators to apply the Water Framework Directive are needed, as well as standardised monitoring and assessment protocols to evaluate the ecological impact
- Water quality monitoring like the development of new analytical tools, new monitoring instruments and the research on the combination of chemical analysis and effect-related methods should be initiated in order to provide complementary information about the chemical composition and the possible effects of a water sample.
- Water treatment processes such as: development of new membranes, modules operating without pre-treatment, hybrid processes, decrease of the environmental impact of treatment plants, “green chemistry”, chemical disinfection, physical processes UV and UV-LED
- Miscellaneous issues, addressing other parts of the water supply chain. The inventory of research gaps

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