

Executive Summary

ACQUEAU is the first industry driven EUREKA initiative dedicated to water related technologies and innovation.

What is ACQUEAU?

ACQUEAU is the first EUREKA Cluster in the environmental sciences.

In addition to being a fundamental and vital benefit for society, water is a major asset:

- The world market for drinking and waste water reached €250 Billion (\$350 Bn) in 2008 (Estimates vary from €250 Bn to €350 Bn according to different sources).
- Infrastructure assets worldwide are huge:
 - o More than 3.5 million km drinking water pipes
 - o More than 2.2 million km of waste water networks
- Corresponding investments represent more than €33 Bn annually.

The water sector also makes a large social impact involving around 600,000 jobs in Europe.

The European contribution within the global worldwide competition needs to be strengthened and improved. The Lisbon protocol defined a target to increase Research and Development (R&D) effort to a level of 3% of GDP. In 2005 this figure for Europe was 1.8%.

ACQUEAU, for the water sector, will contribute to enhance this R&D effort to strengthen the European water industry and increase its competitiveness:

- By stimulating applied R&D.
- By supporting creativity through direct industry initiatives.
- By providing a framework to support R&D for Small and Medium Enterprises' (SME).

The WssTP, the Water supply and sanitation Technology Platform from which ACQUEAU is initiated, is the European Technology Platform (ETP) for water. As a ETP, the WssTP issued a Strategic Research Agenda.

The strategy of ACQUEAU described in the Blue Book, and thereby the main technological areas and five major programmes, are derived from the SRA of the WssTP. Whereas the WssTP promotes Research and Development in general and via the 7th Framework Programme (FP7) favours academic research

ACQUEAU aims to encourage the development of new technological products and new services providing a complementary approach to the WssTP.



Nine Technological Areas for innovation

The water components, the nine technological and working areas of ACQUEAU are based on the water cycle.

ACQUEAU has chosen key working areas to drive innovation and market-driven projects of the water sector and industries.

Water resources Protect water resources and prevent damages to the environment

Water Resources are submitted to various pressures that include climate change, increasing demand, and greater pollution of resources. There is a strong need to develop global management; less expensive and natural treatment technologies for water supply and to increase the use of non-conventional resources by the use of dedicated treatment technologies.

Water treatment Anticipate emerging quality issues and protect the public health

The main challenges are ensuring the quality of the drinking water, safeguarding public health and reducing the energy consumption of Water Treatment Plants (WTP).

Water distribution Optimise the cost of the management of the water

Water distribution systems represent 70% of the cost of managing water. Water distribution systems will face the challenges imposed by a growing demand, climate change, energy efficiency, ageing infrastructure and increasingly stringent service standards.

Customer Enforce the trust and confidence of consumers towards water

The customer now expects information on the water services that guarantees information on the service provided. The expectations of the customers are linked with their specific situation and are very different depending on the level of service that is proposed.

Agriculture Achieve a sustainable production while protecting water resources

Innovation in the agricultural sector will need to tackle the different challenges of public health and water quality, the link between water and energy and the impact of climate change. Technological breakthroughs should target particularly reduced pollution, the safeguarding of water resources and food safety.

Industry

Ensure a sustainable use of water in industrial processes

For industrial wastewater treatment there is a need to further improve existing plants in the short term. In the long term, the challenge is to rethink the overall treatment by quantifying the energy and material fluxes.

Urban drainage and wastewater collection Prevent foul water flooding and avoid inconvenience to the population

For urban drainage, the main issues concern flood risk and uncontrolled wet weather overflows to receiving bodies. The key issue is developing and implementing of technologies for and advanced management of waste water collection and urban drainage systems.

Wastewater treatment

Changing from a consuming industry to one producing resources

The major challenge in the waste water treatment area will be to comply with future regulations, particularly the Water Framework Directive (WFD), whilst accommodating climate and demographic changes. This will have to be achieved whilst reducing energy and chemical consumption by making increasing use of “natural” and biological processes. Increasingly waste water will be viewed as a source of not only water for re-use but also of valuable by-products such as phosphorus.

Bio solids and other sludge

Turning sludges and biosolids into resources for tomorrow

Biosolids management has become one of the most critical issues for the wastewater industry worldwide, due to the very fast increase in biosolid production. Creating sustainable biosolids management solutions that produce valuable materials and energy is the major challenge for the future.

Five Key Programmes to boost competitiveness

ACQUEAU has identified five key challenges to boost the competitiveness of the water sector in Europe and to develop bottom-up solution for the market.

Membrane Technologies

Membrane technologies include any process for water or wastewater treatment achieving filtration through a porous or permeable media made of polymeric, mineral or composite material.

The global membrane market for water applications will grow by 8.6% to over €10,5 Bn in 2012. The objective is to foster the emergence of European champions with new technologies to secure a market essentially dominated today by the United States and Japanese equipment suppliers, and to develop European know-how and equipment in order to propose competitive European technologies for various applications including:

- seawater desalination, brackish water desalination,
- waste water treatment and reuse,
- water softening or removal of organic substances
- disinfection for drinking water production.

Real-Time system Management

Real time system management (RTSM) has to be developed through online sensor networks, data management systems, representation (map, links with GIS, etc.) and modelling, wireless communication systems. The goal is to reinforce European know-how and equipment in order to secure the management of water resources, water and wastewater works, secure the quality of the product delivered to end-users, improve the operation of networks and reduce the cost of construction and better manage water consumption.

Materials for pipes and coating

Water distribution and storage are based on a comprehensive infrastructure for water delivery to private or industrial consumers. They are responsible for about two thirds of the total costs for water supply in developed regions. The objective is to improve durability, safety and cost of healthy and “environment friendly” materials.

Low environmental impacts for disinfection and oxidation

This programme is intended to develop new disinfection or other oxidation processes for the removal of microbiological activity or other harmful compounds. This targets all processes and regulation for disinfection that will 1/ consume less energy and/or less chemicals ; 2/ reduce environmental impacts of water treatment processes and 3/ continue to safeguard public health.

Disinfection is widely used:

- To reduce or eliminate microbiological activity in water.
- To ensure drinking water safety at point of use.
- To guarantee the safety of bathing waters near waste water discharges.
- To reduce harmful compounds or bacteria.

Low energy wastewater treatment

To target low energy waste water implies the development of the municipal waste water plant of the future (2020). It aims to promote worldwide municipal waste water treatment based on different objectives:

- To develop energy self-sufficient plant with energy recovery and energy in situ production.
- To guarantee the removal of pollutants such as nitrogen and phosphorus.
- To transform all effluents solid or liquid to by-products (biorefinery concept).

The main goal is to ensure the protection of water resources and the preservation of the environment.

