

# Project

## Context

### Water as a key pan-European concern

Despite the vast amount of water on the planet, decades of unsustainable management mean that water shortages have reached crisis point in many regions. More than 50 % of renewable and accessible freshwater over the planet is being used today&hellip; While more than 800 million people still have no access to drinking water, according to the 2010 report on &ldquo;Progress on sanitation and drinking water&rdquo; by the World Health Organization.

Most Europeans have so far been insulated from severe water shortages. But the balance between water demand and availability has reached a critical level in many areas of Europe as a result of over-abstraction, low sustainable management and prolonged periods of low rainfall or drought. &ldquo;Water scarcity&rdquo; means that water demand exceeds the water resources exploitable under sustainable conditions. At least 11% of the European population and 17% of its territory have been affected by water scarcity to date. Recent trends show a significant extension of water scarcity across Europe.

## Challenge

In the EU as a whole, energy production accounts for 44 % of total water abstraction, primarily serving as cooling water. 24% of abstracted water is used in agriculture, 21 % for public water supply and 11 % for industrial purposes. Although these EU-wide figures for sectoral water use mask strong regional differences, reducing water abstraction at a European scale is a challenge that has to be addressed.

## Chemical Industry: a key solution provider

Water is involved in the production of materials, processes and technologies for chemical production, therefore converting the European Chemical Industry into a major water consumer. The European Chemical Industry has to make sure that its activities are conducted in a manner which do not adversely impact on health and the environment as a whole. The European Chemical Industry aims to promote and adopt sustainable solutions contributing to the efficient management of the water cycle.

## ChemWater's Challenges

Great challenges face the European Chemical Industry for the development of technologies, materials and processes to improve industrial water management. Among those challenges:

Improve processes for efficient water use;

Integrate the water parameter to the development of new processes & design of industrial & manufacturing plants;

Develop new materials -such as reactive membranes- for improved processes;

Integrate emerging technologies such as nanotechnologies in the existing & upcoming industrial sectors (e.g. white biotechnology).

Ī ChemWater's Four Objectives

The ChemWater project will focus on 4 aspects directly linked to the improvement of the industrial water management cycle :

Establish the interdisciplinary and cross-sectoral synergies between key stakeholders (i.e. ETPs, NoEs, ERA-NETS) related to Chemical Processes and Water Industry. Using this initiative as a pilot for future enlargement to other process industry sector;

Create the necessary elements and mechanisms to facilitate the rapid uptake and commercialization of enhanced materials, technologies and production processes that will allow for an optimized industrial water management;

Develop a common long term vision and strategy regarding technologies directed to realize an efficient industrial water management that will integrate in a crosssectoral and cross-disciplinary manner the necessary resources and relevant stakeholders in order to develop a programme of commonly-defined activities;

Implement an effective dissemination strategy to ensure the transmission not only of the project objectives, but that will take into account as well best practices and methodologies and common long term strategies.

Such a perspective allows the project to extend its reach and impact beyond the chemical sector itself to key strategic European process industry sectors such as mining, industrial biotechnology, health, food, electronic, pulp and paper, and energy. On that purpose the relevant European Technology Platforms (ETPs) will be involved, along with important national clusters.

• Technological Needs tackled by ChemWater

Thanks to ChemWater's interdisciplinary and cross-sectoral approach, technological needs will be tackled, for both the Chemical sector and the Water Industry:

• Water industry needs for its research and technology development:

new chemical products such as new separation compounds (flocculation agents, adsorbents, extractants, membranes with additional functionality, nanomaterials);

new chemicals with less environmental impact, optimised dosing, more selective reaction;  
> new materials like (reactive) membranes, corrosion resistant units, biofilm inhibiting materials;

information exchange to transfer innovative concepts in process engineering e.g. like separation, monitoring or control technologies;

a common view on the possibilities to recover chemicals from chemical waste flows in industry.

ï Chemical and process industries need to integrate routes:

allowing for less impacts, in particular on water resources, by minimizing consumption, optimising recovery of new synthesis, and considering water recycling as part of its run;

decreasing vulnerability of their water consuming processes;

re-using waste water as an energy-interesting source.

The issues tackled by ChemWater have an obvious international dimension, with significant market opportunities for the EU chemical and water industries in other world regions. Information from the project will be disseminated to Russia and the Newly Independent States (NIS) and to the Mediterranean countries.

To this end, International Cooperation Networks, Coordinated Actions and Specific International Cooperation Actions will be asked to contribute in a global approach.

