



**COORDINATING EUROPEAN STRATEGIES  
ON SUSTAINABLE MATERIALS, PROCESSES  
AND EMERGING TECHNOLOGIES DEVELOPMENT  
IN CHEMICAL PROCESS AND WATER INDUSTRY  
ACROSS TECHNOLOGY PLATFORMS**





## WHAT IS CHEM WATER ?

**ChemWater** is a jointly envisioned strategy developed by the Water supply and sanitation Technology Platform (WssTP) and the European Technology Platform for Sustainable Chemistry (SusChem), with the support of the Networks of Excellence The European Membrane House (EMH), The European Nanoporous Materials Institute of Excellence (ENMIX) and the European Research Institute of Catalysis (ERIC), who are key partners in the design of the strategy. The aim of this project is to address a key pan-European concern: the efficient management of water in the process industry and promote a new added value perspective: "chemistry for water" instead of the traditional "water for chemistry".



### IN A NUTSHELL

EU Project: FP7-NMP-2010-CSA-4

Grant Agreement n°: 266851

Partners : 11

Start Day : 1 May 2011

End: 31 October 2013

Budget : 949.332 €

Website : [www.chemwater.eu](http://www.chemwater.eu)



## CONCEPT



## OUTCOMES

- Chemistry-Water synergies
- Visioning 2050
- Strategies and measures on enhancement of new products/technologies
- Joint Implementation Action Plan



## OUTLOOK & THE FUTURE



## PARTNERS, DISSEMINATION & COMMUNICATION



## CHEMWater's OVERALL OBJECTIVE: EFFICIENT WATER MANAGEMENT IN THE PROCESS INDUSTRIES

To achieve this objective we set out to:

- Link process industry and water industry knowhow to sustain water resource.
- Develop a long-term strategy for a sustainable industrial use of water in close coordination with existing initiatives and projects.
- Exploit the technological potentials in the fields of nanotechnology, materials and process innovation.

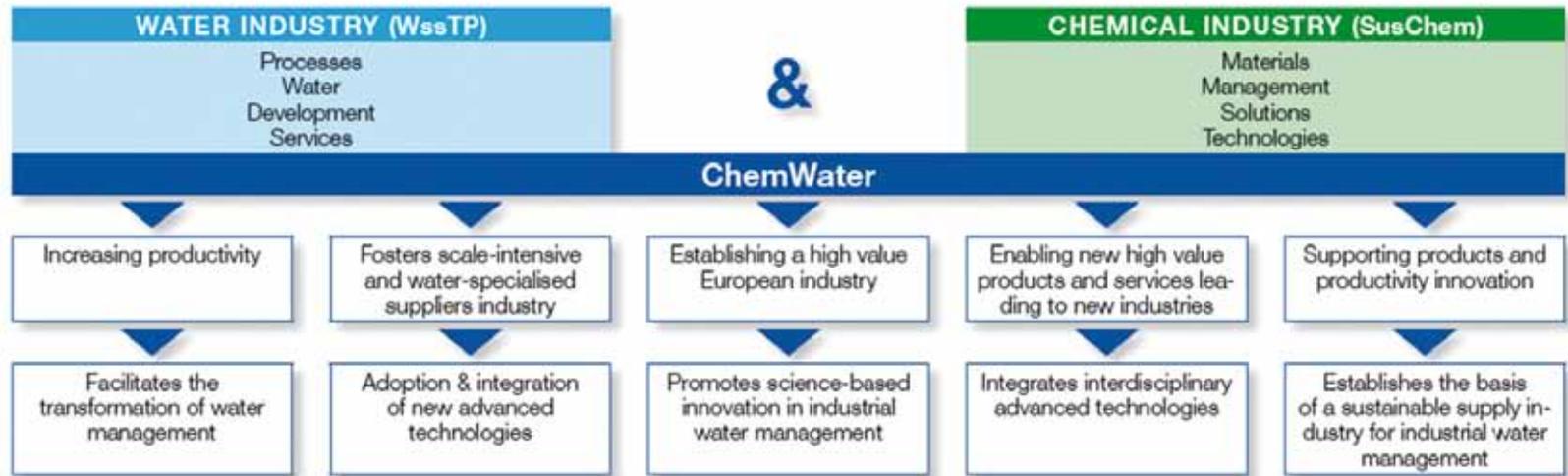


Figure 1. ChemWater's Target



# OUTCOMES

**CHEMISTRY-WATER SYNERGIES BASED ON THE ANALYSIS OF THE STRATEGIC RESEARCH AGENDAS AND IMPLEMENTATION ACTION PLANS OF WSSTP AND SUSCHEM AS WELL AS OTHER RELEVANT EUROPEAN TECHNOLOGY PLATFORMS (ETPs) AND NETWORKS OF EXCELLENCE (NoEs)**

## THE BASIS

**WATER IS AN ESSENTIAL RESOURCE FOR THE SUSTAINABLE DEVELOPMENT OF EUROPE. IT IS INTENSIVELY USED BY DIFFERENT SECTORS: AGRICULTURE, INDUSTRY AND URBAN. IT MAKES WATER MANAGEMENT, ON THE ONE HAND, A CHALLENGING SUBJECT THAT CANNOT BE TACKLED BY ONE SECTOR ALONE, AND ON THE OTHER HAND AN OPPORTUNITY FOR EUROPE TO DEVELOP SOLUTIONS FOR THE WATER CHALLENGES AND TO ESTABLISH A LEADERSHIP POSITION IN THIS DOMAIN.**

The water sector has a key role to play in the development and implementation of sustainable water technologies in and from Europe.

The chemical industry also plays an important role in the whole water cycle, being on the one hand one of the biggest water-users, and on the other hand, one of the biggest providers of water treatment materials and technologies.

A clear synergy potential between the chemical sector and the water sector on the way towards an integrated industrial water management was identified in the basic [ChemWater](#) analysis. The synergies are related to four priority areas: water quality, water quantity, water – energy nexus and non-technological issues. Based upon these initial results the endpoints for development routes towards a sustainable future use and treatment of water in industry were defined in the Vision 2050. The related actions needed to realize the vision are the heart of [ChemWaters](#) Joint Implementation Action Plan. The Action Plan directly addresses key European programmes and initiatives that have a relation to industrial water management. The Action Plan is supported by proposals for strategies and measures to foster the implementation of new products and technologies.

The analysis of the state of the art through the Strategic Research Agendas of the different European Technology Platforms and Networks of Excellence, leads to the following conclusions:

- With the exception of SusChem, WssTP and SRM no other ETP among the ones included in the study, considered water as one of the priority topics in their Strategic Research Agenda (SRA) or Implementation Action Plan (IAP). This situation has dramatically changed in the recent years and sustainable water management has also become a priority for the other ETP's: Manufature, EuMat and ESTEP.
- A 12% of the total water abstraction in Europe is used for industrial purposes. A more efficient and sustainable water management will have a positive impact, reducing the competition among the different water users through the implementation of the "Symbiotic approach".
- Waste water: a new concept. It should be considered as a source of water, valuable materials and energy. The integration of the Industrial, Urban and Rural water management, will facilitate to exploit the synergies of the multiple efforts carried out in R&I and the dissemination of results.
- The new integrated water management approach proposed by SusChem and WssTP: recycling, reuse, advanced waste water treatments and use of alternative water resources, will be crucial in the development of a bio-based economy in Europe.
- Water-Energy resource: new solutions will allow the reduction in energy consumption for fresh water availability, distribution and waste water treatments. New ways of producing energy out of water plants will be explored.
- The Enabling and Industrial Technologies: Advanced materials, Advanced manufacturing technologies, Nanotechnologies, Industrial biotechnology and Micronanoelectronic/ IC , will have a key role in supporting implementation of a more sustainable water management.
- The WssTP task force on Membranes for water treatment identifies the next process generation of hybrid membrane systems for water treatment and for low energy seawater desalination as key innovation areas.

environmental impact  
 / process designs  
 and valorization  
 "across the fence"  
 water use of water  
 competitiveness  
 water availability at right place / movement  
 measurements

# VISIONING 2050 ON WATER SUSTAINABLE PROCESS INDUSTRY

A major objective of ChemWater was to identify the main challenges facing the European chemical industry and related process industries in the area of water use. The ChemWater vision for 2050 for the European Chemical Industry and aligned process industry sectors is that :

It is important to set realistic targets for sustainable water management and the definition for 'sustainable' used here, is 'no adverse effect on the local area'. Cross-sector cooperation and integrated water resources management will play important roles in achieving this target.

## THE PRINCIPAL CHALLENGES IN EUROPE

Europe is facing a number of primary challenges; these include balancing demand with fresh water availability, ensuring the quality of all Europe's fresh water bodies, dealing with the effects of climate change, addressing the water-energy nexus, as well as ensuring the expansion of bioprocess based industries without increase of water consumption.



### WATER QUANTITY

1. The European Chemical Industry and aligned sectors will be a benchmark sector for sustainable water management.
2. The European chemical and associated process industries, as well as consumers along the value chain, will act to minimize water footprint.
3. The growth of current and new industrial sectors e.g. industrial biotechnology will be decoupled from higher resource consumption.

### WATER QUALITY

4. The European chemical and associated process industries, as well as consumers along the value chain will make zero contribution to water stress.
5. New water and waste water treatment technologies will deliver water of appropriate quality for the type of use/discharge environment.

### WATER - ENERGY

6. Sustainable and efficient water management will be based on efficient and reduced energy use.
7. Energy sources will be diversified and mainly based on the use of onsite energy production and the utilization of renewables, leading to zero or minimum contribution to carbon footprint

### NON-TECHNOLOGICAL

8. A symbiotic approach for ecological and economical efficient use of water and other resources, integrating industrial, urban, and rural/agricultural resource flows will be widely implemented.
9. The European chemical industry will fully exploit its position as an enabler for the entire economy to provide opportunities for other sectors to deliver innovative solutions to water resource management challenges.
10. Stakeholders will have reliable, innovative and sustainable industrial water management solutions available.

## DRIVERS FOR CHANGE TOWARDS MORE SUSTAINABLE WATER USE

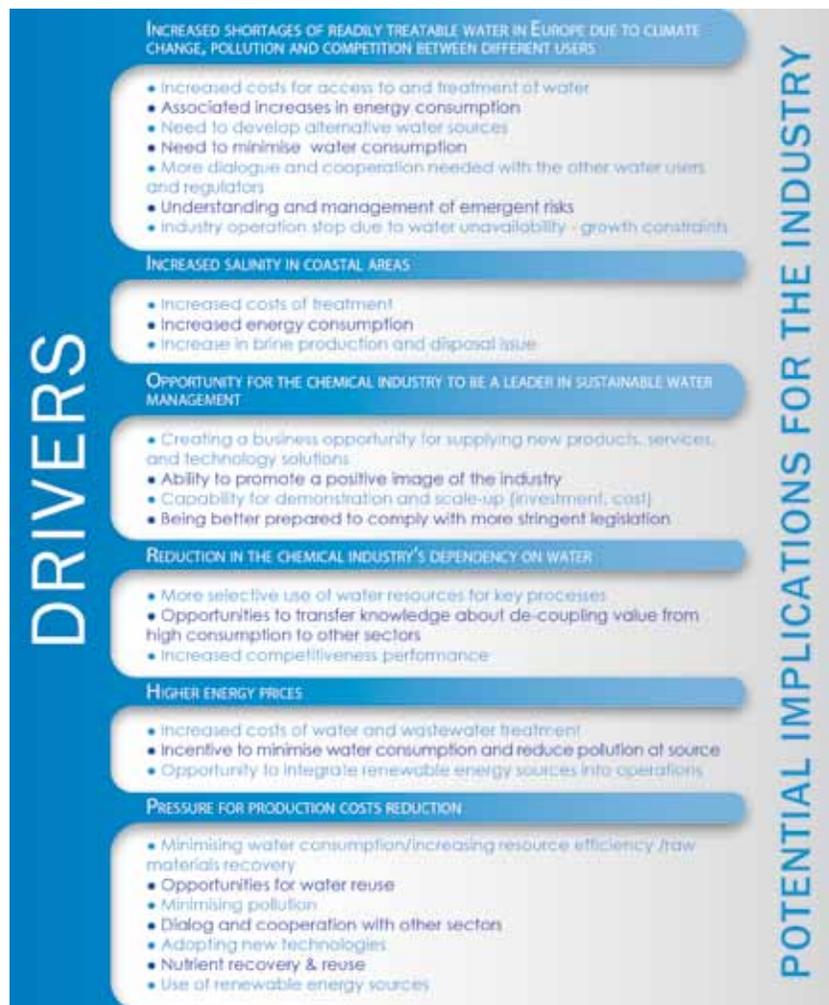


Figure 2. Drivers promoting sustainable water use in the European chemical and related industries (Workshop 1 & 2, EEA (2012), CEFIC (2011), EC (2009), WSSTP (2005))

## SET OF 3 WORKSHOPS ON WATER SUSTAINABLE PROCESS INDUSTRY 2050

In 2012, a set of 3 workshops was organized in order to develop a vision in close cooperation with industry, platforms and knowledge institutes, and to identify the regulatory, social, economic and political drivers which are guiding the European chemical and related process industries towards a more sustainable water use. Figure 2 summarizes the drivers identified during workshop discussions and subsequently refined in post-workshop analysis. The workshop debates highlighted the important role of regulation in setting the operating environment for water use in the process industries. However, it was widely recognized that legislation and regulations alone are not capable of driving the sort of mindset change required to implement innovative and integrated solutions are to be realized. Such fundamental change is a supra-regulatory issue with investment needed in education, solution demonstration, and innovation to achieve a permanent shift in attitudes towards water as a resource.

### Workshop 1

« Water Sustainable Process Industry : Vision 2050 »

1 March 2012, Brussels



### Workshop 2

« Water Sustainable Process Industry 2050 : Methods and tools ». This workshop was a satellite event of the Green Week

24 May 2012, Brussels



### Workshop 3

« Vision 2050 : Materials, processes, technologies on Water Sustainable Process Industry »

5 September 2012, Brussels.



# VISION 2050

## WORKSHOP 1

"VISION AND CHALLENGES"

### CHALLENGES IDENTIFIED

- Unknown strength of industrial sectors in Europe by 2050
- Economic challenges: competitiveness, availability of materials and resources
- Integration of resource management strategies
- Water availability, allocation and governance
- Minimize environmental footprint: energy/ greenhouse gas / water
- New products and processes with minimal footprint
- Innovative re-use and valorization of streams
- Standardization for comparison

## WORKSHOP 2

"TOOLS AND METHODOLOGIES"

### ARRANGEMENTS NEEDED TO IMPLEMENT THE VISION

- Biochemistry
- Separation technologies
- Materials technology
- Industrial process design
- New catalytic and low temperature processes
- Nanotechnology
- Reducing pollution at source
- Recovery of materials from process streams
- Alternative water resources. Cooperation with the urban and agricultural fields.

## WORKSHOP 3

"PROCESSES, MATERIALS AND TECHNOLOGIES FOR WATER SUSTAINABLE PROCESS INDUSTRY"

### DIRECTIONS FOR SOLUTIONS : MATERIALS, PROCESSES AND TECHNOLOGY CHALLENGES

- Water quantity, water quality, energy and resources
- Chemical process engineering, reaction and process design
- Emerging water treatment technologies

# JOINT IMPLEMENTATION PLAN

## WORKSHOP 4

INDUSTRIAL WATER MANAGEMENT ON THE EDGE TO HORIZON 2020

- DEFINING ACTIONS TOWARDS THE INDUSTRIAL WATER VISION 2050 -

## WORKSHOP 5

COOPERATION TO PREVENT HARMFUL CHEMICALS IN THE WATER CYCLE



## STRATEGIES AND MEASURES ON ENHANCEMENT OF NEW PRODUCTS / TECHNOLOGIES

The synergy between the water and the chemical sectors has been articulated through promoting a shift in the paradigm through which water is perceived in the industry, bringing this resource to be viewed as a key, valuable resource to achieve a sustainable, competitive chemical industry. To consolidate this paradigm shift and enroot it in the social environment, a set of measures has been proposed in the frame of ChemWater. These range from the standardization of sustainable water use by the process and water industries to the transmission of the water paradigm shift to future water and chemical sector professionals at university and technical school level.

### FOSTERING THE ADOPTION OF INNOVATION

Best Available Techniques (BAT) Reference Document (BREF) are available to many industrial sectors although their significance among the companies and governments is distinct in each field. It is however usual that innovation is not given sufficient relevance in the BREF's. ChemWater has contacted with the national best available techniques input groups to find out how innovation is addressed in the BREF documents and devised measures to speed up the integration of innovation into the documents.

### WRAPPING UP: THE POLICY FRAMEWORK

The achievement of the water paradigm shift and the adoption of the innovative technological tools required for such change, can only take place in the adequate social environment. ChemWater has proposed a set of policy measures to facilitate the uptake in the industry of those new technologies and materials that contribute towards the final goals of the project.

### THE WAY TOWARDS REWARDING SUSTAINABILITY

The change in the water paradigm can be achieved faster through rewarding those industries committed with a sustainable water use. In order to facilitate an objective assessment of sustainable water use, ChemWater has analysed the different tools and indicators available and defined the way in which those instruments should be applied in the industry so that they can be translated into fiscal incentives that reward sustainability.

### INTRODUCING NEW MATERIALS AND PROCESSES: RISKS AND SUCCESS

By looking at past attempts to introduce new technologies and materials in the chemical industry, the ChemWater consortium was able to identify the factors associated with the failure or success of such endeavours. The information gathered will contribute to avoid future failures in the process to enable the adoption of new technologies or materials by the industry.

## JOINT IMPLEMENTATION ACTION PLAN

To approach the challenges, objectives and needs identified within the Visioning 2050 process a range of ChemWater action lines were defined. In the Joint Implementation Action Plan proposals for development routes are connected with related European programmes and initiatives.

### EUROPEAN PROGRAMMES AND INITIATIVES

#### Horizon 2020

Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. It is the EU Framework Programme for Research and Innovation (2014-2020). Horizon 2020 supports an excellent science base, strengthens competitiveness by building industrial leadership in Europe and is tackling societal challenges for a better society.

ChemWater provides inputs to the water related key enabling technologies for industrial leadership and for tackling societal challenges, as efficient use of resources

#### European Innovation Partnership on Water

The European Innovation Partnership (EIP) on Water aims to boost opportunities for innovation in the water sector. It facilitates the development of innovative solutions and approaches that contribute to economic growth, solve societal challenges, create jobs and enhance Europe's competitiveness. Within the EIP on Water eight priority areas have been chosen.

For three of the eight priority areas ChemWater provides direct thematic input: Water reuse and recycling; Water and wastewater treatment, including recovery of resources; Water-energy nexus.

#### PPP SPIRE - Sustainable Process Industry through Resource and Energy Efficiency

SPIRE aims to develop enabling technologies and solutions for resource and energy efficiency in the process industries. The objective is to reach long term sustainability for Europe in

terms of global competitiveness, ecology and employment. To achieve this SPIRE has defined two ambitions: reducing fossil energy intensity and reducing non-renewable, primary raw material intensity.

ChemWater has identified development needs for a sustainable water management that fosters the SPIRE ambitions.

#### PPP BRIDGE - Biobased and Renewable Industries for Development and Growth in Europe

BRIDGE aims for a biobased economy by a transition towards a post-petroleum society while decoupling economic growth from resource depletion and environmental impact. In the heart of its vision BRIDGE is addressing biorefineries and an efficiency increase of industrial biotechnology.

As water is essential and extensively used for biotechnological processes ChemWater has defined action fields that will help biobased industries to become more water efficient.

#### European Innovation Partnership on Raw Materials

The EIP has the overall target to reduce Europe's import dependency on the raw materials that are critical to Europe's industries. Besides a secure supply the EIP on Raw Materials aims to ensure and achieve efficient and sustainable management and use of non-energy materials along the entire value chain in Europe.



Water plays an important role for extraction, processing and recycling of raw materials.

The ChemWater action fields promote a knowledge transfer from chemical process to mining industries.

### Public Private Partnership (PPP) Factories of the Future

The PPP aims towards an innovation-driven transformation of European manufacturing sectors.

Environmental and economic sustainability of manufacturing, two of the main challenges, have a direct relation to ChemWater in terms of reduction in water use, cost efficient treatment and sustainable water management.

### European Institute of Innovation and Technology (EIT) - Knowledge and Innovation Community (KIC)

A KIC is a highly integrated, creative and excellence-driven partnership which brings together the fields of education, technology, research, business and entrepreneurship. The objective is to produce new innovations and new innovation models. They will be key drivers of sustainable economic growth and competitiveness across Europe through world-leading innovation. The results of ChemWater and its partnerships provide the basis to develop a KIC on "water and chemistry". These are two strategic domains in which Europe has today a leading position.



### ChemWater & E4Water Joint Workshop 4

« Industrial Water Management on the edge to HORIZON 2020 - Defining actions towards the Industrial Water Vision 2050 ».

7 March 2013, Brussels.

### Workshop 5

« Cooperation to Prevent Harmful Chemicals in the Water Cycle » during the World Water Week 2013

3 September 2013, Stockholm



# OUTLOOK & THE FUTURE

## I THE CHEM WATER ACTION LINES

### ALTERNATIVE WATER SOURCES

Alternative water sources are a key solution for reducing fresh water dependency of chemical process industry. They can be made available by cascade use, reuse, symbiotic cooperation and by storage concepts e.g. for rainwater. This includes cooperation of different water users across industries and cooperation with municipalities. Besides reliable, cost and energy efficient technologies that meet all demands of the different water providers and users, an integrated water management approach is needed to cope with the individual demands.

### TOWARDS ECO-EFFICIENT WATER LOOP CLOSURE

Water loop closure, focusing on recycling and reuse of wastewater on a site is another concept to reduce fresh water consumption. Today a full water loop closure is in most cases neither ecologically nor economically viable. One of the major bottlenecks to increase the recycling and reuse rate in industry is the treatment and valorization or disposal of the concentrates. Actions have to be taken to reduce the dependency between loop closure, cost efforts and energy demand. For example novel concentrate treatment options reducing technology and energy efforts and opening up valorization options can help with this.

### VALORIZATION OF COMPOUNDS AND ENERGY FROM (WASTE) WATER STREAMS

Industrial wastewater is source for compounds and energy. Selective separation of organic and inorganic compounds like raw materials or nutrients is a key issue. The challenge is to recover them in an appropriate, competitive quality that enables their next use. Full utilization of carbon sources in wastewater for energy production still shows a significant potential for im-

provement. Low temperature (< 40°C) residual heat in industrial water streams is poorly used today but released in huge amounts. Here solutions for utilization have to be developed.

### ENERGY EFFICIENT INDUSTRIAL WATER MANAGEMENT

Energy costs and CO<sub>2</sub> emission are drivers to improve energy efficiency in industrial water management. To increase energy efficiency thermal aspects and energy consumption have to be considered. Linking process- and cooling water management or establishing a heat/cold management "across the fence" is an issue. Utilizing energy out of wastewater streams as indicated in the topic before can contribute to an increased efficiency as well. (Waste-) water treatment processes show a high potential to increase energy efficiency by moving stronger towards a dynamic performance management of treatment processes.

## WATER AND WASTEWATER TREATMENT TECHNOLOGIES

Improvement potentials in treatment technologies are manifold. They can contribute significantly to all action lines mentioned above. But as industrial water demands and wastewater composition are extremely variable the range of opportunities for action is wide. Biotechnological approaches like anaerobic treatment are not fully utilized today. Separation and reaction technologies used in chemical industry have to be considered for future development of water and wastewater treatment technologies. Hybrid processes like combining photo catalysis and membrane techniques show a high potential for improving treatment performance.

## ADVANCED MATERIALS AND SURFACES

Advanced materials and surfaces can significantly help to increase the performance and efficiency in industrial water treatment. Nanomaterials can play an important role here. Intelligent

surfaces for example can help to reduce fouling and scaling in water systems. Advanced and multifunctional materials provide the potential to combination functions in treatment processes or enhance performance like adsorption capacity, selectivity or heat transfer. Catalytic materials can significantly reduce the energy demand for oxidation processes while increasing process efficiency. Advanced materials might play an important role for increasing the efficiency in concentrate treatment. They are also essential for more sensitive, faster sensors and monitoring systems.

## MONITORING AND CONTROL

Improvements in monitoring and control are basic needs to increase performance of industrial water treatment systems. They are also required to move towards an eco-efficient, integrated industrial water management system. For example the range of parameters and applications for real time online sensors in water quality monitoring has to be extended. This will help to separate waste water into streams suitable for recycling and reuse. New sensors together with ICT tools are needed for a dynamic performance management of treatment processes. So that the performance of treatment technologies can be attuned to variations in incoming water qualities and quantities, process and water industries.

## NEW DESIGN OF PROCESSES

Rethinking the design of production processes in industry with regard to water use is challenging. The industry focus is on performance in production and less on water as a utility. Nevertheless reduced fresh water uptake, less wastewater to treat and fewer related energy use are ecological and economic incentives. To realize this action requires a closer cooperation between experts from reaction and process design and industrial water management. Action should be taken for example



on reducing temperature levels for steam related production processes or on a more efficient water use in the production of bio-based chemicals.

## New AND UPCOMING INDUSTRIAL DEVELOPMENTS

Europe is moving towards a bio-based and resource efficient economy as key elements of the Europe 2020 strategy. Industrial biotechnology and biorefineries have a high demand on process water: Action has to be taken to accompany this industrial development with appropriate water treatment technologies and an eco-efficient, integrated industrial water

management. Another area where resource efficiency initiates new developments is the raw materials sector. Water treatment and management is of importance for extraction, processing and recycling of raw materials. Action needs to be taken to transfer the technologies and expertise developed by the cooperation of chemical process industries and the water technology industries to new and upcoming industrial developments.

	Alternative Water sources	Towards eco efficient water loop closure	Valorization of compounds and energy from (waste) water streams	Energy efficient industrial water management	Water and wastewater treatment technologies	Advanced materials and surfaces	Monitoring and Control	New design of processes	New and upcoming industrial developments
Horizon 2020	✓	✓	✓	✓	✓	✓	✓	✓	✓
EIP on Water	✓	✓	✓	✓	✓	✓	✓	✓	✓
PPP SPIRE	✓	✓	✓	✓	✓	✓	✓	✓	✓
PPP Bridge	✓	✓	✓	✓	✓	✓	✓	✓	✓
EIP on Raw Materials		✓	✓	✓	✓	✓	✓	✓	
PPP Factories of the Future		✓	✓	✓				✓	✓
EIT - KIC		✓	✓	✓	✓	✓	✓	✓	

Figure 3. ChemWater action lines for European programmes and initiatives



# PARTNERS, DISSEMINATION & COMMUNICATION

**11** PARTNERS IN THE PROJECT HAVE BEEN ALL STAKEHOLDERS IN ONE OR BOTH OF THE TECHNOLOGY PLATFORMS AND ARE DRAWN FROM INDUSTRY AND ACADEMIA



DECHEMA e.V -DEC, Germany  
[www.dechema.de](http://www.dechema.de)



European Membrane House a.i.s.b.l, Belgium  
[www.euromemhouse.com](http://www.euromemhouse.com)



European Nanoporous Materials Institute of Excellence, Belgium, Germany  
[www.enmix.org](http://www.enmix.org)



European Research Institute on Catalysis, Belgium  
[www.eric-aisbl.eu](http://www.eric-aisbl.eu)



European Chemical Industry Council, Belgium  
[www.cefic.org](http://www.cefic.org)



Flemish Institute for Technological Research NV, Belgium  
[www.vito.be](http://www.vito.be)



Netherlands Organization for Applied Scientific Research, The Netherlands  
[www.tno.nl](http://www.tno.nl)



SUEZ ENVIRONNEMENT SA - SE, France  
[www.suez-environnement.com](http://www.suez-environnement.com)



VEOLIA ENVIRONNEMENT S.A., France  
[www.veolia.fr](http://www.veolia.fr)



Complutense University of Madrid, Spain  
<http://portal.ucm.es/en/web/en-ucm>



Cranfield University, United Kingdom  
[www.cranfield.ac.uk](http://www.cranfield.ac.uk)

## DISSEMINATION & COMMUNICATION

Our goal was to develop a reliable and efficient system for:

- **Broad dissemination of information** throughout the project: status and main perspectives.
- **Communication**, to attract and identify the relevant experts and organizations at the interface between ETP's and the final objective:
  - > To set-up a **permanent interaction between all the stakeholders** interested in water technologies and services for the process industries
  - > To create the appropriate environment to **exploit the synergies** among the different actors, leading to a more integrated approach
  - > To transfer the knowledge into **education and training initiatives**.

## IMPACT

Contribution to European Programmes and Initiatives  
Efficient communication  
Relevant contact persons  
Extended **ChemWater** dissemination Network

## WEBSITE : [WWW.CHEMWATER.EU](http://WWW.CHEMWATER.EU)

The website was created to introduce the project in its integrative dimension which linked to the websites already existing in each instruments.



## NEWSLETTERS

3 newsletters have been issued to inform the interested scientific and professional communities on the status, progress and more recent advances of the project as well as about related relevant events.

# [WWW.CHEMWATER.EU](http://WWW.CHEMWATER.EU)



## EVENTS

The project has participated in 17 events, conferences and workshops.

- [ChemH2O conference](#) on 1-2 October 2013 in Madrid, **Spain**
- [IMETE Summer School Nanotechnology for water treatment](#) on 9 September 2013 in Ghent, **Belgium**
- [World Water Week](#) on 1-2 September 2013 in Stockholm, **Sweden**
- [EU Meeting on Industrial Technologies](#) on 17-20 June 2013 in Dublin, **Ireland**
- [10<sup>th</sup> IWA Leading Edge Conference on Water and Waste Water Technologies](#) on 2-6 June 2013 in Bordeaux, **France**.
- [SusChem 2013 Stakeholder Event](#) - "The root of EU Growth and Jobs: Innovative Materials and Processes" on 14-15 May 2013 in Brussels, **Belgium**
- [WASSER BERLIN INTERNATIONAL Congress](#) on 23-26 April 2013 in Berlin, **Germany**
- [9<sup>th</sup> European Conference of Chemical Engineering \(ECCE9\)](#) and the [2<sup>nd</sup> European Conference of Applied Biotechnology \(ECAB2\)](#) on 21-24 April 2013 in The Hague, **The Netherlands**.
- [3<sup>rd</sup> workshop of the nano4water cluster](#) on 17-18 April 2013 in Dresden, **Germany** : Nano- and membrane-based systems for water treatment
- [STEP-WISE and STREAM Final Conference](#) : "Building Bridges - Facilitating Water Information Exchange between Science, Policy and Industry" on 3- 4 December 2012 in Brussels, **Belgium**
- [World Water Week](#) on 27 August 2012 in Stockholm, **Sweden**
- [Industrial Technologies 2012](#) on 19-21 June 2012 in Aarhus, **Denmark**
- [ACHEMA 2012](#) on 18 – 22 June 2012 in Frankfurt, **Germany**
- [WssTP annual meeting](#) on 15-17 May 2012 in Brussels, **Belgium**
- [Joint stakeholder event with ACQUEAU](#), Water Innovation Europe on 15-16 May 2012 at the International Press Centre in Brussels, **Belgium**
- [SusChem's 10<sup>th</sup> Stakeholder Event](#) on 17-18 April 2012 in Brussels, **Belgium**

## ENMIX

« The **ChemWater** project was an excellent opportunity to cooperate with the two our networks ERIC and EMH - in addition to the interaction and collaboration with all other partners within the **ChemWater** consortium. The second ENMIX workshop was successfully arranged in cooperation with EMH at Vatnahalsen (Norway) in September 2011. The common project work devoted to the «Joint Research and Development Roadmap (JR & DR) on Water in Chemical Process Industries Across NoEs» gave us an comprehensive overview with respect to the waste water treatment related to the chemical process industry. This represents a very good platform in order to initiate R&D projects dedicated to this topic. Furthermore, we look forward to a fruitful final **ChemWater** Review Meeting in connection with the ChemH2O2013 Conference, to be held in Madrid, October 1-2, 2013, hopefully giving rise to new perspectives and opportunities for future cooperation. Finally, ENMIX would like to arrange, together with ERIC and EMH, a common «Water Workshop devoted to the Chemical Process Industry» in connection with the launch of Horizon 2020, as initiated by Prof. Gilbert Rios. »

## VITO

« VITO strongly valued the multidisciplinary character of the **ChemWater** network. The project was situated at the intersection of innovative material research and the industrial perspective on future process and water challenges. The bringing together of those two worlds really enabled the alignment of research priorities and opened the pathway to set up more integrated approaches. The attention for non-technological aspects also forced us to look behind the research activities and analyse the story behind the success stories or failures. »

## TNO

« After intensive cooperation, public and private partners developed a long term Vision. It envisions sustainable water for chemical industry and a roadmap to come there. To implement this vision we have to follow the proposed routes for R&D, innovations, demonstrations and remove road blocks by new initiatives, which will be set up under the Horizon 2020 programs! »

## DECHEMA

« Working towards eco-efficient management of water in European chemical industry needs an ongoing cooperation of chemical process industry and water industry to realize the innovation potential of the action lines identified and initiated by **ChemWater**. »

## VEOLIA

« One of the most interesting feedback from **ChemWater** is to have create a network of experts from industry, institute and university coming from chemical industry, water world and some experts (as in catalyst for example) thanks to a strong input of industrial partners. We can exchange on vision of 2050 needs for water in industry including, technological, economical and environmental points of view. Veolia had also the opportunity to communicate on the already existing industrial water management and recycling of industrial waste water and reuse of municipal waste water for industrial applications in order to clearly show the current technical baseline nowadays and the early achievement in order to well define the technical challenges for 2050. »

## Suez Environnement

« **ChemWater** project was one of the first European initiatives resulting from the collaboration of Technology platforms (WssTP and SusChem). It was successful in gathering all actors of the industrial water cycle and technical contributors from Excellence networks during 30 months for elaborating a shared strategy supporting the sustainable use of water as final aim. The approach was also made innovative by highlighting from fruitful discussions and next analysis, the opportunities and benefits of cross contributions from the water and process industry fields. We, within Suez Environnement, are strongly convinced that both this special project environment and the ensuing outcomes constitute a sound basis for next enhanced collaborations for in field fast improvements and innovations on a longer term, all serving the close integration of water management in industry plants. »

## Cranfield University

« The **ChemWater** project has offered an excellent environment within which to explore greater integration between Europe's chemical and water sectors. The workshops provided a particularly fruitful opportunity to learn more about the ambitions of the chemical industry and the challenges it faces in advancing sustainable production and consumption cycles. We've been impressed with both the variety of perspectives represented during the workshops and the quality of debate which has generated innovative thinking and opportunities for ongoing collaboration. »

## CEFC

« The **ChemWater** project is the perfect tool to realize the current state of the art in water technologies for industrial applications, not only in the Chemical sector, but also in Mining, Steel, etc. and learn how these sectors can capitalize on the synergies of working together to address the future challenges of industrial water management in Europe and make the Vision 2050 become a reality. »

## EMH

« For the EMH, the **ChemWater** project was an excellent opportunity to strengthen the links established since 2006 with the two other NoEs /Networks - IDECAT/ERIC on one side and Insidepores/ENMIX on the other side-, and to reinforce the idea that all these smart technologies correctly integrated represent for Europe a unique tool to develop the breakthrough systems and processes which our societies need for facing correctly with their future. One main challenge is undoubtedly sustainable development, with a correct integration of industrial activities with other ones such as agriculture, city development.... The main point here will be to preserve a free and guaranteed access to water for all ! Undoubtedly a great field of application for the smart technologies here above mentioned, which will ask for a holistic approach associating all the actors of the platforms, with a special attention to SUCHEM (chemistry, industry) and WssTP (water). The matrix vision at the based of **ChemWater** was a perfect frame to do that. As an outcome of the work done together, we would like to arrange together with ERIC and ENMIX, a common «Water Workshop devoted to the Chemical Process Industry» in connection with the launch of Horizon 2020. Different platforms and other new instruments (EIP, PPP...) would be invited to participate.»

## UCM

« **ChemWater** comes to an end. We, in the UCM, believe that the results obtained will have an actual influence on near future research policies by contributing to the creation of a solid bridge between the chemical and the water sectors. I can ascertain without doubt that the key to the success of this initiative relies on two facts, the collaboration among the partners in the consortium and the active engagement of all participants to bring in the contributions from relevant external actors and organizations. We definitely look forward to future coordination and research initiatives with this team.»

PROJECT COORDINATION

**DECHEMA**

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