

**Coordinating European Strategies on Sustainable Materials,  
Processes and Emerging Technologies Development in Chemical Process  
and Water Industry across Technology Platforms**

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## 1. Introduction

ChemWater project WP5 has the objective of defining strategies and measures that can create conditions to facilitate the transfer of technological and non-technological innovation into commercial products and services. Next to the link to the technological synergies and integration measures from WP4, the focus will be on soft measures:

- Development of a strategy for creating synergies between technological and economic mind setting and adoption by society and industry of the integrative approaches
- Development of a strategy to enhance policy tools to facilitate or to debottleneck the introduction of new materials in water technologies and introducing water technologies in chemistry.

Since the project started at the same time of the launching of the European Innovation Partnership (EIP) on Water, it was decided to align the objectives and scope of the ChemWater project to the EIP. One of the major changes was to enlarge the scope to other sectors that might face the same challenges and benefit from the same or little adapted solutions.

The objective of task 5.4 is to propose recommendations for policy tools that enhance cross-sector technology transfer in order to support the development of a market for technologies aiming at a more sustainable management of water by the chemical industry and other big water user sectors.

Throughout the lifespan of the project, several workshops had taken place with the objective of gathering information about the current situation in industrial water management, including the identification of barriers and bottlenecks to implement innovation in the water field. Overcoming these barriers and bottlenecks should result in a faster implementation of new solutions to address the water challenges for European industries.

The technology offer is high although some gaps have been also identified and described in WP2 and WP4, and the result is the Joint Implementation Action Plan.

Implementation of innovation is boosted, on the one hand by market needs, that is, the demand aspect and technological solutions offered, but on the other hand, there is a need of creating an atmosphere of confidence to invest in innovation in water (non-technology perspective). Both, technology and non-technology innovation could be fostered by policy measures.

For the objective of this report, the identified barriers for a wider implementation of innovative solutions have been grouped as: Economic; Market; Health & Safety issues; Policy/Regulatory/Governance; Socio-cultural; Others and Skills and education.

Concerning the “Policy tools” a selection of the ones considered more relevant for the scope of the ChemWater project, has been done. The proposed measures are expected to influence in a positive way the future landscape of water management in industry.

## 2. Selected Policy tools

- Policy/Regulatory/Governance: this group has also been identified as barrier to innovation. Regulatory Framework can either booster or hinder innovation. European legislation is, probably, the most advanced one and a reference in the world, the experience shows that boost innovation in early stages, i.e. the implementation of the FWD had a direct influence in the number of new solutions in the market; but Regulation has been widely identified by stakeholders as one of the most important barriers to

- implement new solutions. To be successful in the integration model (symbiotic approach), new Governance mindset is needed.
- European standards, covering quality aspects will also support the deployment of solutions in industrial water management, as an example, definition of different water qualities for different applications, “fit for use”. The same should be applied to the quality of recovered materials, with the aim to contribute to the circular economy.
  - Public procurement: should be adapted to facilitate the access to the market of new solutions. The importance of the public demand will help to increase the presence of innovation making the offer more competitive.
  - Environmental Technology Verification project (ETV): The concept of this programme is to offer a verification procedure to cutting edge environmental technologies that may otherwise find it difficult to establish their environmental added value. The verification procedure allows for an independent assessment and validation of the manufacturer's claims on the performance and environmental benefits of their technology. The information produced by the verification is public and can be used to compare performance parameters and therefore becomes an extremely useful tool to convince third-parties of the merits of a technology, potentially enhancing its market value and acceptance.
  - National and regional policies: their actions have to be consider under a global perspective, from regulation implementation to regional initiatives like the Smart Specialization; from trans-national collaboration to allocation of national/regional funds in water related topics.
  - Financing for innovation: the difficulties to justify investments in water due to low ROIs; lack of access to finance, especially by SMEs; Not enough number of Public-Private initiatives, etc. need to be analysed in detail and find new mechanisms.
  - EIP on Water: the Strategic Implementation Plan of this initiative has defined the policy framework for innovation in water for the next period 2014-200, with technological and non-technological priorities. The coordination of dedicated resources to innovation at European level is one of the advantages that should come out of is implementation.
  - Eco-innovation Action Plan and SET Plan have been considered relevant to the topic. Wider access to renewable energies and support to eco-innovative solutions will also help to the dissemination/replication of new technologies/products or services by European industries.

The relationship between barriers and the selected policy tools is shown in table 1, where the green color highlight those where expected actions should have a higher impact.

Table 1: Policy tools and barriers to innovation

Barriers		PolicyTools								
		Policy/Regulation /Governance	European Standards-Quality	Public Procurement	Environmental Technology Verification Program	National/Regional policies	Financing (Public/Private)	EIP on Water	Eco-I Innovation Action Plan	SET Plan low C economies
Economic	New technologies not competitive;									
	Prohibitive cost of new technologies									
	Potential for increased energy consumption									
	Increased operating costs (increased energy consumption, additional monitoring, etc.)									
	Prohibitive cost of removing pollutants;									
	cost of pilot lines and scale-up of new technologies									
	Insufficient investment in, poorly targeted, or poor quality R&D									
	Insufficient investment in required infrastructure									
	Prohibitive cost of the required infrastructure									
	Insufficient investment available;									
	Need for significant capital investment									
Market	Competition for investment with other sectors									
	Use & continuity of renewable energy supply									
	Lack of sufficient funding for R&D&I									
	Tailor made solutions (reduced market size)									
Health & Safety issues	Lack of effective routes to market for developed solutions									
	reuse of valuable materials									
Policy/Regulatory/Governance	recovery/reuse of energy									
	Emerging health and safety issues and new risks									
	lack of water reuse application criteria									
	Licensing barriers to accessing new sources;									
	water reuse and recycling									
	Disposal or reuse of generated waste streams									
	Lack or harmonisation across EU									
Socio-cultural	recovery/reuse valuable materials									
	Local or regional bureaucracy									
	Long lasting approval process for new products/technologies									
Others	Water as a valuable resource									
	Public acceptance									
	Ineffective dialogue									
	Adoption of new practices slow									
	Geographical location prevents easy access									
Skills & education	Competing R&D priorities within the sector;									
	Need for effective dialog with other sectors									
Skills & education	Current infrastructure (pipelines)									
	Lack of trust – IP rights									
	Conflicts of interest between stakeholders;									
Skills & education	Lack of relevant skills and knowledge;									
	Competition for quality graduates with other sectors									

 Expected positive impact

### 3. Policy measures

Table 2

Policy Measures	
Policy/Regulation/Governance	Harmonisation of EU regulation in water and waste-water (treatments/qualities)
	Coordination of different actors (administration divisions) dealing with water issues
	Stimulate cooperation among sectors: water and industrial
	Reduce administrative burden in licence/permits
	Foster dialog among stakeholders (Regulators/local authorities/water utilities/users)
European Standards	Development of standards at European level to support a "European Union" market for water technologies/products/services
Public Procurement	Adeuation of public procurement rules and tenders
Financing (Public/Private)	Tax reduction for Companies implementing innovative solutions in water
	Public- Private partnerships
	Access to loans for SMEs
	Engagement of financial institutions in the water innovation process
	R&D&I funding
Technical & Technological	Creation of "Showcase places" where innovative solutions could be demonstrated/proven to facilitate dissemination/replication.
	Adeuation of infrastructures
	Coordination of Research & Innovation programmes for an efficient use of resources
Socio-cultural	People awareness through EU/National/Regional campaigns
	Transparency in information
	Skills & education programmes adapted to current situation and challenges
	Companies engaged in training of skilled workers

## 4. Recommendations towards a more solid EU policy - extract from EPC Discussion paper

Under the wings of the European Policy Centre (EPC), being an independent, non-profit think tank committed to making European integration work, the Blue Gold Task Force was initiated. This Task Force will explore the water challenge in and outside the EU, the on-going efforts to tackle the challenge, as well as the related benefits. It will consider the role of internal and external EU policy instruments in the process as well as the challenges and benefits of developing a common EU water policy. Their key findings and recommendations will be explained with the help of case studies and will be put into a comprehensive publication, to be distributed widely to European policy makers and key stakeholders.

Referring to the EPC Discussion Paper 'Risky Resources - Time to frame an EU approach to meeting the resource challenge' (Annika Ahtonen and Andrea Frontini), with a specific focus on water, some first recommendations towards a more solid EU policy are listed:

- Change starts at home (internal actions):
  - promote eco-efficiency, which means doing more – or the same – with less. This can easily be applied on water as an important resource;
  - before putting new directives or regulations in place, ensure the implementation of existing policies on eco-efficiency (Water Framework Directive, European Innovation Partnership on Water,...);
  - built an internal market for products and services that contribute to a greener economy. More cooperation is needed here between research, development, industry,.. in order to get products and services to markets, including innovative water treatment technologies. Via Life Cycle Analysis, the wider picture should be screened;
  - stimulate public and private investments;
  - important to build up and manage the knowledge on resource efficiency in order to grow stronger and provide a solid ground for further actions;
  - lead by example and convince non-European players of EU success story.
  
- Towards comprehensive, coherent and ambitious external action:
  - towards more EU inter-service cooperation, especially in policy planning on the external aspects of resource management. The involvement of the civil society, NGO's, think tanks, scientific and business sector, ... will be needed here;
  - develop a more holistic approach on European level and globally, and consider the needed instruments and financial resources;
  - aim at suggestions for policy guidelines on global resource management. Take the lead in this;
  - create a correct level playing field for eco-efficient products and services, which requires recognition and calculation of the true cost of using resources throughout their life cycle.
  - take clear steps towards a more active role for EU in international cooperation;
  - lead by example, and demonstrate and promote the proven benefits of eco-efficiency.

A number of these recommendations are also relevant for tackling the water challenge in Europe and beyond. These recommendations, alongside the role of the EU, member states and industry, will be developed and discussed in more depth during the EPC's Task Force on Blue Gold.

## 5. Conclusions

To succeed in the implementation of innovation in water, improvement of technologies is not the only solution Europe needs a new mindset and work in a coordinated way to capitalize on the synergies among different sectors and disciplines.

There is a strong competition and European industries need to look at all the resources and process if they want to be in leading positions.

A coordinated European policy will support the development of the required environment to boost investment in water technologies either at private and public levels.