EUROPEAN INNOVATION PARTNERSHIP

WATER

STRATEGIC IMPLEMENTATION PLAN

BRUSSELS 18 DECEMBER 2012

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Water is a vital resource for life, and for our economy. However, the aquatic environment faces many serious challenges such as water scarcity, pollution and ecosystem degradation. These pressures will increase in Europe and globally due to climate change and the increasing global population. Therefore, urgent action is needed to tackle these challenges.

In 2012, which I have labelled the 'year of water', we have taken two important steps. Firstly, we adopted the Blueprint to Safeguard Europe's Water Resources which proposes ways to improve the implementation of EU water policy, to stimulate better integration of policies and to complete our legal framework. Secondly, we launched the European Innovation Partnership (EIP) on Water and adopted this Strategic Implementation Plan.

The Blueprint signals the need for innovative solutions to deal with our water challenges, as it is clear that continuing a 'business as usual' approach will not be sufficient. The development of successful innovations requires an enabling policy framework that addresses existing barriers. The European Commission aims to achieve this through the Flagship Initiative on the Innovation Union. The EIP on Water with its Strategic Implementation Plan is an important component of this.

Innovative solutions also require a change in thinking from involved stakeholders. Often what is needed is not something new, but rather using existing tools in a different or more efficient manner, or approaching a challenge from a different perspective together with others.

I have been inspired by the way in which so many different stakeholders have participated in the development of the EIP on Water through the various public consultations and discussions. I am particularly grateful to the members of the Steering Group and the Task Force, who have developed this Strategic Implementation Plan in a very short time, demonstrating their willingness to overcome different points of view to agree on a joint strategic vision for water and innovation.

We need innovative solutions to tackle water challenges and those same solutions will help us to seize market opportunities, in Europe and outside. In times of economic crisis, tackling our water challenges is not so much a cost as an investment.

I am committed to do my part in this joint venture, and I am looking forward to continuing a stimulating cooperation with all stakeholders to achieve results.

Contents

1. INTRODUCTION

This Strategic Implementation Plan (SIP) is a milestone in developing Europe's strategy with regard to water and innovation, combining a long term perspective with concrete short term actions. The SIP presents the views of the Steering Group of the European Innovation Partnership (EIP) on Water with regard to its priorities and the actions to be taken to achieve the aims of the EIP Water to:

- Facilitate, support and speed up the development and deployment of innovative solutions to water challenges; and
- Create market opportunities for these innovations both inside and outside of Europe

The EIP Water is led by a Steering Group, consisting of 27 high-level representatives of relevant stakeholder groups and spanning both the demand and supply sides of innovation. The Steering Group is supported by a Task Force, composed of 45 stakeholder representatives. The Task Force has worked from September until December 2012 to prepare the SIP for the Steering Group.

The Steering Group is strongly encouraged by the wide interest that the development of the EIP Water has raised from all relevant stakeholder groups and the many contributions that have been made to this SIP and the process of the EIP Water in general. Many activities on the European, national and regional level have been initiated in relation to the EIP Water, supporting the conviction of the Steering Group that the EIP Water has clear relevance and added value as a tool at the European level.

This SIP provides clear and concrete actions to enable effective monitoring of the actions it will initiate. This SIP is the start of a process to initiate actions that will support the European strategy for water and innovation. The SIP will be subject to review and amendments by the Steering Group on an annual basis, to be able to take into account developments and available knowledge.

1.1. VISION

The vision for this EIP Water is: “To stimulate creative and innovative solutions that contribute significantly to tackling water challenges at the European and global level, while stimulating sustainable economic growth and job creation”.

The Steering Group is convinced that in order to reach the aims of the EIP Water, a wide perspective to innovation is required, that embraces new products, processes and ways of working in the public as well as the private sector. In addition to research and technology, drivers to innovation such as financing, awareness-raising, ICT, governance, training and others need to be integrated in order to successfully identify and remove barriers to innovation and to ensure the uptake of innovative solutions. Furthermore, a global perspective is required, as many innovative actions are based on cooperation with international partners, or target international opportunities. A link with existing initiatives at the European, national and regional level is essential to prevent overlaps and create synergies.

HEADLINE TARGET

The European Innovation Partnership on Water aims to achieve the following headline target by 2020:

Identify, test, scale up, disseminate and stimulate the uptake of innovative solutions by the market and society for 10 major water related challenges.

2. WATER AND INNOVATION

2.1. CHALLENGES

There are significant challenges in Europe with regard to water quality and quantity. As reflected by the Blueprint[1] to safeguard Europe's water resources, almost half of Europe's freshwaters are at risk of not achieving good ecological status, the main objective of the EU Water Framework Directive by 2015, with adverse effects on biodiversity and public health and hampering the provision of ecosystem services. Water scarcity and droughts already affect one third of the EU territory across different latitudes, while floods cause deaths, displacements and large economic losses all over Europe. Significant investments are needed to build, operate, maintain and adapt water infrastructures in order to face these challenges inside Europe and in other developed countries. Many developing countries are still struggling with the provision of basic needs like adequate water supply and sanitation, which are a prerequisite to fight poverty and promote economic development. These challenges are projected to increase due to climate change, socio economic developments and increasing water demand in agriculture to support essential ecosystem services as food and development of a bio-based economy. Recent studies show that by 2050, 2.3 billion more people than today are projected to live in river basins experiencing severe water stress. Additional pressures will exacerbate competition between water users, putting irrigated agriculture, ecosystems, cities, industries and, in general, economic development at risks in several regions of the world[2].

With its pathfinder legislative standards, world class water service companies and cutting edge technology providers, Europe is already a leader in the global water sector. Consequently, Europe should take the responsibility to take lead in developing innovative solutions to tackle the global water challenges while seizing the market opportunities this will bring.

Because markets alone are not always capable of delivering the appropriate innovations at the right time, policies are required, to both support the development of innovative technologies, institutions and business models, and facilitate the dissemination and implementation of these technologies across Europe and globally.

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[11] Communication from The Commission to the European Parliament, The Council, The European

[2] OECD (2012), *Environmental Outlook to 2050*, OECD Publishing, Paris

The full exploitation of the European innovation potential with regard to water challenges is hindered through persistent bottlenecks and barriers. The European water sector is relatively risk adverse and scattered while knowledge and technology are excellent but often fragmented. For EU industry sectors such as the process industries, where water is a key resource, efficiency gains are hindered by a lack of applicable innovations. Furthermore, EU instruments focusing on the innovation supply side are not always adequately linked to demand side actions and financial instruments; e.g. procurement rules do not always favour innovative solutions. Time to market needs to be shortened, and innovation support actions at EU and national level like accelerating product approvals, fast-tracking standard settings, simplify financing requirements or eliminating contradictions between policies can play an important role.

2.2. OPPORTUNITIES

The common EU market and environmental standards bring an advantage for designing and validating water innovations. Boosting the development of innovative solutions to deal with water challenges and supporting their deployment and market uptake brings significant economic opportunities in a rapidly growing world market for water solutions, in which many European companies are active and where there is strong potential for job creation. Furthermore, the costs of inaction are significant in terms of losing global market opportunities for the European industry, including SMEs. Inaction could even lead to an increase in the need to import adequate technologies. Innovations in reducing water intensity of production processes, water recycling and water reuse in water using industries can bring important opportunities and are prominent in the public-private innovation agendas.

Although water is predominantly a local issue, water problems are increasingly globalised, requiring focus at a range of scales, from local responses to global strategies. While there are many opportunities for innovation based on experiences within the EU, there is a need to look, learn and develop strategic partnerships with countries and regions already experiencing the challenges of Europe’s future.

To fully exploit the opportunities for water related innovations in all related sectors, the Steering Group recognizes that a European strategy and support actions are required to complement national and regional activities and secure synergies among them, while including local perspectives. The opportunities for sustainable economic growth through facilitating innovation are being recognized and have been placed central in the Europe 2020 strategy and its Innovation Union flagship initiative, which has proposed European Innovation Partnerships to deal with grand societal challenges such as water. The EIP Water is not a mechanism to enforce implementation of legislation. However, in addition to economic growth, the EIP Water expects to create environmental opportunities by serving as an important tool to support the policy options identified in the Blueprint to safeguard Europe's water resources and the wider European resource efficiency agenda.

2.3. AN ACTIVE APPROACH TO DISRUPTIVE INNOVATION

Innovation must always be judged against economic as well as technical criteria. Innovation needs to lead to either new products or services, or to improve existing ways of managing precious water resources at lower cost or higher quality for the same cost.

Europe is very strong on research but fails to turn the knowledge into added value for society and markets. Crossing this “valley of death” - the gap between basic knowledge generation and the subsequent commercialisation of this knowledge in marketable products - requires

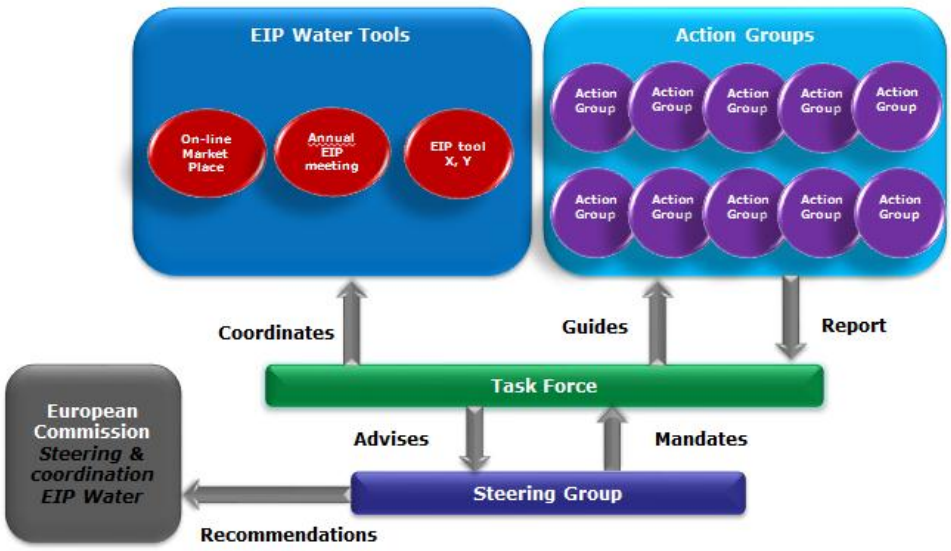
an integrated approach of demonstrations and scaling-up projects, increasing acceptance of new technologies, public-private cooperation and appropriate investments.

Incremental water innovation emerges through interactions between water users, research and technology development and legislative requirements. In this arena the EIP Water will play a significant role as a catalyst by identifying barriers to innovation and proposing ways to remove them. The EIP Water also has the potential to significantly impact disruptive innovation by stimulating the application of the entire innovation value chain: linking supply focussed initiatives, such as the EU Horizon 2020 program, to technology development (including SME's, intellectual property rights arrangements and innovative financial mechanisms), to demonstration or prototyping opportunities, to market development and further market uptake. The EIP Water will encourage this approach by supporting actions that require the participation of actors from public and private organizations (and the many existing hybrid combinations), as well as knowledge institutes and covering the various disciplines such as finance, ICT and governance.

This requires intense cooperation between the EIP Water and knowledge related initiatives at the European, national and regional level. The EIP Water will function as an overarching initiative that will make direct use of the activities of existing initiatives, such as the 7th Framework Programme (FP7), Horizon 2020, the Joint Programming Initiative (JPI) on Water as well as other European and national activities such as Technology Platforms or National Water Partnerships. Furthermore, cooperation with the EIPs on Agricultural Productivity and Sustainability, Raw Materials and Smart Cities may bring opportunities and will prevent overlaps. The candidate Public Private Partnership (PPP) SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) addresses water and energy efficiency and will provide important opportunities for coordination and cooperation. These initiatives have also been included in the EIP Water governance structure, to develop a joint agenda and coordinate strategic planning that incorporates the entire value chain.

3. GOVERNANCE

The governance structure of the EIP Water allows for making accelerated progress towards its overall objectives, is action oriented, minimises bureaucracy and stimulates stakeholder participation.



STEERING GROUP

The Steering Group will meet annually to provide strategic guidance and decision making and will make recommendations to the relevant European Commissioners on policy and implementation. The Steering Group will be responsible for amending the Strategic Implementation Plan, evaluating and monitoring of progress and ensuring the result driven approach of the EIP Water. The Steering Group mandates the Task Force to coordinate and disseminate the activities of the EIP Water and to make recommendations on amending the SIP.

TASK FORCE

The Task Force will allow stakeholder groups and enablers for water and innovation to meet and discuss the strategic agenda for water and innovation, to prepare the strategic decision making by the Steering Group. In addition, the Task Force will guide the process of establishing Action Groups and provide a platform for feedback on their experiences and findings. Furthermore, the Task Force will play an important role in coordinating other EIP Water activities, in order to ensure cross-fertilization. The Task Force will also mandate the development of EIP Water tools, based on identified demands.

The Task Force will be asked to develop the necessary background analysis and input for decision making and can create smaller expert groups, supported by co-opted experts. The Task Force will work on identifying best practices and barriers to innovation, developing policy recommendations, promotion of project portfolios and dissemination strategies.

The Task Force will meet twice or more per year, according to the need expressed by the Task Force itself.

The composition of the Task Force is based on those organizations that are enablers for facilitating innovation in water and that can provide a wide representation of the relevant stakeholder groups. Members of the Task Force commit to an active contribution to the activities of the Task Force.

EUROPEAN COMMISSION

The Steering Group requests the European Commission to act as a facilitator of the EIP Water, keeping oversight and driving the overall process. In addition, the Steering Group requests the European Commission to provide a link with EU funding mechanisms and relevant policies, to support the activities of the EIP Water and to take recommendations into consideration. The European Commission, with support of the Task Force, will select the Action Groups that can work under the framework of the EIP Water, ensuring quality control of the content and of the process. The stakeholders will be the drivers of the activities under the EIP Water, facilitated by the European Commission.

A Secretariat has been set up to support the various activities and bodies of the EIP Water. The Secretariat works under the supervision of the European Commission.

An initial set of Action Groups and Tools are described in section 5, EIP Water implementing actions.

4. PRIORITY AREAS OF WORK

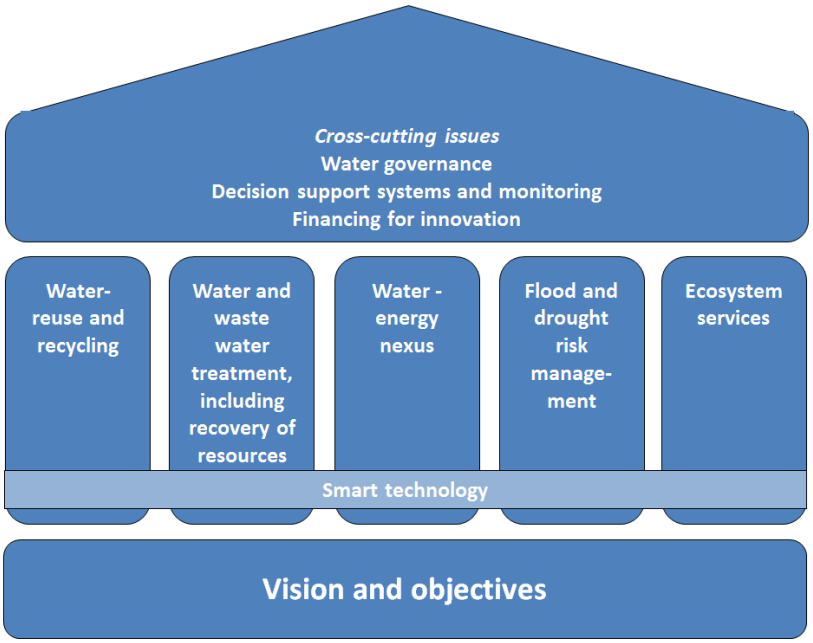
Responding to the challenges and opportunities in the water sector requires a holistic approach. With the aim to focus on those innovative actions which deliver the highest impact and provide the most opportunities, the Steering Group has identified the following priority areas:

- Water reuse and recycling;
- Water and wastewater treatment, including recovery of resources;
- Water-energy nexus;
- Flood and drought risk management;
- Ecosystem services.

In addition, cross-cutting priorities have been identified that address framework conditions, promote connections between the different priority areas of work, and are enablers for all other actions:

- Water governance;
- Decision support systems and monitoring;
- Financing for innovation.

Furthermore, "smart technology" has been identified to be of key relevance as an enabling factor within all other priorities.



The selection of these priority areas has been made on the basis of six selection criteria: (1) Likely to make the greatest contribution to the objectives of the EIP Water; (2) Broad innovation potential; (3) Competitive advantage of European industry and Job creation potential; (4) Attractiveness for investors and entrepreneurs; (5) Likely to benefit particularly from the partnership approach; (6) Potential to impact public awareness/consumption patterns.

For each priority, the Task Force has defined the scope, based on an analysis of the key challenges, bottlenecks, market opportunities, leading to the definition of objectives and concrete actions. The SIP will be regularly updated to guide the EIP Water based on further analysis and reflection by the Task Force and the Steering Group. Below sections provide a summary of the analysis of the EIP Water priorities, their objectives and definition of initial actions, which are to be taken up within the framework of the EIP Water.

4.1. WATER REUSE AND RECYCLING

Challenges

Water recycling and reuse should be considered as the core of an integrated water management approach to save costs, recover materials and demonstrate environmental stewardship. The use of non-conventional water resources through recycling and reuse can support the provision of safe, available and affordable water, while decreasing energy needs, reclamation costs and environmental impacts. Hence, it is an essential component in a sustainable water management.

Bottlenecks

The implementation of water recycling and reuse suffers not only from technical barriers, but also from other bottlenecks such as a limited institutional capacity to formulate and institutionalize recycling and reuse measures, a lack of financial incentives and public perceptions towards water recycling, reclamation and reuse. Further barriers are sub-optimal markets for recovered nutrients and a lack of well-developed and robust industrial processes using different qualities of water and the absence of EU harmonised safety and quality standards for reused water.

Market opportunities

The potential market for innovations in water reuse and recycling, through implementing technological solutions and adoption of policy and legislative measures, is expected to grow and develop significantly within and outside Europe, particularly in highly water stressed regions.

Objective

An effective policy framework is in place and Fit for Purpose/Symbiotic approaches are applied, gaining efficiency of water use by better integrating urban, industrial, agricultural and environmental uses. Innovative solutions provide different water qualities for several cross cutting applications and allow for achieving a balance between the natural water needs in the environment and the growing demands for human and economic activities. Public participation processes are in place for promoting risk awareness and behavioral change in water recycling and reuse.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. Fit for Purpose/Symbiotic approaches based on technical, economic, social and environmental criteria, where cost-effective treatment meets intended use and quality.

2. Innovative solutions and/or treatment options, producing and testing recycled/reclaimed water for residential, urban, industrial and agricultural uses, with consideration of ecosystems and involving multiple stakeholders.

3. Systems capable of determining the quality of recycled and reclaimed water to improve management and public acceptance according to health requirements.

4. Innovative separation- and extraction technology pilot projects in industrial zones to harvest resources from waste- and re-used water.

4.2. WATER AND WASTEWATER TREATMENT, INCLUDING RECOVERY OF RESOURCES

Challenges

Sufficient quantity of water with the right quality needs to be supplied, bringing the challenge to match the available water resources with the required type of water. In addition, there is a need to change the focus from treating wastewater and sludge to be ready for disposal, to providing water fit for use and yielding revenues from recovered energy and resources. Robust wastewater treatment units can lead to the development of new products and business opportunities. This priority area can be considered as complementary to priority area 4.1.

Barriers

There is a lack of awareness of the economic value of water by end-users, as well as a lack of incentives for full-scale implementation and validation of innovative solutions. At the same time, social acceptance of recovered resources is limited, partly through a lack of knowledge with regard to the occurrence of emerging pollutants, and how they are spread.

Market opportunities

There are significant market opportunities for new business models and governance structures which can prevent defragmentation and can reorganise/redesign water, rainwater-harvesting and groundwater processing on site. Efficient nutrient recovery and setting first steps to support the creation of a single nutrient market will create new jobs and business opportunities in and outside Europe. Furthermore important market opportunities are anticipated for knowledge and technology with regard to innovative water and wastewater treatment systems.

Objective

Water, energy and resource activities in the water and wastewater treatment process are integrated in order to recover nitrogen, phosphorous, biopolymers and/or elements to produce biofuels and other valuable materials from wastewater and enhance energy

recovery. Other objectives are the application of water saving techniques avoiding product losses and the elimination of micro pollutants and drug resistant bacteria.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. Innovative concepts for (alternative) water supply, wastewater treatment and recovery of resources.

2. Source control methods for discharges of emerging pollutants and pathogens into the wastewater treatment system and cost-effective on-site technologies, removing as much as possible at source.

3. Water treatment innovation hubs, in regions that currently lack of appropriate sewer systems and treatment and sanitation facilities, applying smart technologies and decentralized systems with a focus on alternative water sources.

4. Systematic approaches to avoid loss of water, energy and resources in industrial production and water and wastewater infrastructure.

4.3. WATER-ENERGY NEXUS

Challenges

The interrelations and interdependencies between water and energy are well known; The interconnected challenges and key issues of both sectors should there for be addressed together. This priority area considers three relations: energy for water, energy from water and water for energy.

Barriers

European water and energy policies are not sufficiently integrated, resulting in neglecting interconnected effects. Furthermore, economic incentives to adopt efficient water and energy technologies are inadequate. Water and wastewater processes lack low energy technologies, whereas the application of renewable energy is hindered by low efficiency. In addition, these processes are designed to run with constant energy supply, while most renewable energy sources provide variable energy supply. Meanwhile, efficient and cost-effective technologies to recover energy from wastewater are not yet fully available.

Market opportunities

The market potential for innovation in this area is expected to be very high. The potential of energy savings in water treatment processes, or through reduced demands of transporting water in infrastructures is very significant. With regard to the potential capacities for energy production, the energy contained in wastewater could be up to around 2% of the total energy demand, while it is expected that worldwide blue energy and tidal energy could contribute to at least 7% to the future energy needs. In addition, more than 50% of the industrial sectors' water demand (which is around 20% of the total water demand) is used to produce energy. Furthermore, there is a lack of low energy irrigation technologies that can be applied by modern agriculture. Efficiency gains in these processes will bring significant opportunities.

Objective

The contribution of base-load renewable energy produced from water in the European energy mix is significantly increased, while efficient technologies for water use, treatment and recovery of energy from (waste) water are developed, applied and marketed.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. Approaches for reducing energy consumption related to drinking water production, wastewater treatment, industrial water use, and irrigation for agriculture.

2. Innovative and widely applicable solutions for energy recovery and/or surplus energy production both from water in natural systems as well as from anthropogenic water use.

3. Develop and demonstrate widely applicable concepts and solutions for water use related to energy production, urban and industrial hot/cold water systems.

4.4. FLOOD AND DROUGHT RISK MANAGEMENT

Challenges

Floods and droughts have enormous environmental, social and economic consequences and it is expected that climate change effects will exacerbate their occurrence and impacts in the future. Management of extreme events requires an integrated risk management approach that includes prevention, preparedness, response and recovery. Furthermore, education, awareness-raising and communication to the general public and economic actors is needed to allow them to deal with transitions and change.

Bottlenecks

There is a lack of integration of currently scattered monitoring networks, as well as a need to overcome uncertainty in meteorological forecasts for flood and drought risk assessment at local and regional scales. Furthermore, there is a lack of integration of different dimensions of risk, insufficient knowledge on the economic value of risk and risk reducing measures, and a lack of awareness and preparedness of populations to deal with risks.

Market opportunities

Given the worldwide importance of extreme events and the potential for innovations in strategies and tools, there are numerous market opportunities for products and services at the European and international level. Private companies and industries can develop and commercialize services and products for prevention, protection and mitigation of extreme events, while water and land managers (both public and private) can improve their efficiency and promote demonstrations and showcases for export.

Objectives

State of the art, innovative flood and drought risk and crisis management information systems, integrating all relevant technological and societal aspects and actors, are

increasingly implemented. In addition, novel approaches are established and implemented in the frame of a new risk management culture.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. Innovative extreme event prevention and protection tools, including sensor technology and monitoring networks, forecast and early-warning systems in urban, rural, riverine and coastal areas, for support of policy, land-use planning and emergency management.

2. Innovative mitigation and adaptation measures to minimize climate change impacts, including the role of natural ecosystems and their protection.

3. Integrated risk assessment and management approaches, ranging from planning to implementation of new insurance policies, bringing together the physical, economical, insurance, emergency management and social factors, based on resilience and social vulnerability and ensuring social acceptance.

4.5. ECOSYSTEM SERVICES

Challenges

Ecosystem services is an innovative approach that tries to value the benefits that humans receive from ecosystems (i.e. in monetary terms) in order to integrate them into water management. This is a challenge in an already complex water management framework. The relatively poor knowledge on the role of ecosystem services in the provision of water related services needs to be transformed into a credible, replicable and scalable concept.

Bottlenecks

Innovation with regard to integration of ecosystem services into water resources management requires overcoming the fragmentation of responsibilities and knowledge between disciplines, administrative bodies, agencies and entities. Water use planning and pricing policies need to actively address ecosystem needs. There is a need to better understand connections between healthy ecosystems and the attainment of social and economic goals. Monitoring and reporting frameworks which are better aligned with the ecosystem approach are not sufficiently developed, while the assessment of their environmental, economic and social values is even weaker.

Market opportunities

The introduction of an ecosystem services approach offers market opportunities in the water utilities sector and other sectors for the introduction, implementation and administration of sustainable ecosystem management and eco-toxicology. Furthermore, the establishment of markets dealing with quantified ecosystem services offer opportunities further develop the concept of payments for ecosystem services.

Objectives

The valuation of ecosystem services is widely implemented and includes other approaches such as non-monetary valuations for tangible and intangible ecosystem services in project

and program evaluation. The protection of ecosystems is complemented with a service and management oriented approach, including the aspects of biodiversity in aquatic habitats. Furthermore, the position of ecosystem services is strengthened through involvement of all stakeholders in awareness-raising and support of its implementation in a range of applications.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. Methodologies for valuation of and payment for ecosystem services, including tangible and intangible services.

2. Innovative management schemes addressing water related ecosystem services in Europe and non-European countries.

4.6. WATER GOVERNANCE

Challenges

Technological innovation is almost impossible without considering the governance aspects and vice versa. Facing the challenges in the water sector always includes the technical and the governance dimensions and these mutually influence each other. Innovation of water governance is necessary to better realize collective goals of public interest, whereas the governance of water innovations is crucial to foster technical innovations and to overcome the barriers that hinder them. The main challenges for water governance are related to the eminent complexity that comes along with the paradigms of modern/integrated water management. Integration concerns time and spatial scales as well as integration of sectors and interfacing with numerous other legislations and policy domains.

Bottlenecks

The main bottlenecks for innovation of water governance are the fragmentation of institutions and responsibilities. This results in institutional barriers, a low profile on the political agenda and a lack of public awareness and private involvement.

Market opportunities

Innovation of water governance may enable/accelerate technical innovations and can thus be a driver for innovation, resulting in indirect market opportunities. In addition, various innovative modes of water governance can be marketed, especially when they are aligned with technical innovations.

Objectives

Gaps between, among others, sectorial policies, institutions, regional levels, stakeholder groups, and different planning horizons are bridged and interfaces are established. At the same time, improved private governance arrangements are in place, especially in global value chains and in developing countries. Existing models can be verified in EU member states and their transfer to potential other settings within and outside Europe are evaluated. Furthermore, approaches to support water pricing as a tool to set the right incentives are tested, to support the realization of collective goals and to enable structural changes. An

integrated picture of barriers in the governance system that hinder innovation is created and innovative interventions to overcome them are developed.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. Innovative forms of governance that connect across boundaries of regions, policy sectors, jurisdictional levels and timescales, and that simultaneously involve the public and raise public awareness.

2. Partnership models which link private sector governance, such as certification, stewardship and round tables, to public sector water governance with a view to achieve sustainable water management in low-income countries and emerging markets.

3. Water pricing policies based on innovative approaches, where the over-user pays principle is added to the polluter pays principle, defining clear and measurable efficiency targets for each area of activity at the relevant level.

4. Interventions to overcome barriers in the governance systems that hinder development and uptake of innovations.

4.7. DECISION SUPPORT SYSTEMS AND MONITORING

Key challenges

Water management in Europe and around the world is facing major challenges and is currently going through a paradigm shift from a focus on water supply to water demand management. This paradigm shift is widening the scope to a more holistic approach, covering not only the hydrological but also the ecological, socio-economic aspects. Water management models and monitoring, better described as Modelling and Decision Support Systems (MDSS) are instrumental in supporting the paradigm shift.

Bottlenecks

A number of bottlenecks stand in the way of effective implementation of MDSS to support the holistic approach to water management. The complexity of aspects related to water management, such as ecological, economic, social and institutional perspectives need to be better integrated at the technical and methodological level. Information exchange requires leadership and is often hindered by legal and institutional barriers. Moreover, long term funding opportunities are missing, limiting the development of durable solutions, while litigation risks for MDSS owners limit public access of the available data.

Market opportunities

MDSS technology is expected to bring large market potential for the private sector, including specialist SMEs, software and data management developers, technology centres and others. Especially the smart water concept has huge global business opportunities, with the greatest potential in ICT, software and analytics development, but also hardware and infrastructure development. Various international sub-markets are foreseen. In high-income countries & emerging markets capital intensive solutions are expected, while solutions adapted to the capacity to pay will be demanded in low-income countries.

Objective

Modelling and Decision Support Systems have improved and data and information are more accessible. MDSS are widely applied throughout Europe and are exported, to support a holistic approach in water management. MDSS in combination with metering and sensor technology allows real time assessments in order to optimize water management within, but also across, the different water using sectors.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. Smart water management systems with export potential, based on multi-sourced data platforms including quality and quantity monitoring, data management and modeling. The platforms should include data sources from water cycle and data sources from other interconnected domains.

2. Interconnection of smart sensor based monitoring networks, crowd-sourcing, localized and other smart information dissemination and data management to enhance operational services.

3. Model and monitoring standards for the global water cycle with integration of all water cycle aspects (ecological, environmental, economic, social) to establish a leaders' role in the export market.

4. Well targeted monitoring and analysis of drinking, waste and process water to enhance decision making.

4.8. FINANCING FOR INNOVATION

Challenges

Limited access to appropriate forms of finance can be a restraint to water related innovations, both inside the single market and for European firms seeking to market their products and expertise outside the EU. A key challenge is to increase overall financial flows to the sector through innovation in pricing methodologies and practices. Crucial factors in financing for innovation are creditworthiness and perceptions of risk versus reward; where appropriate blending of grants with loans and other financial instruments can have an important part to play. Equally, non-financial instruments matters like appropriate incentives, and training and knowledge sharing can help to unlock financing.

Bottlenecks

There are insufficient overall financial flows into the sector and weak profitability arising from inadequate cost recovery. Furthermore, the water services sector, as well as other industrial sectors such as the process industry, have a high capital-intensity, with built-in risk aversion due to public health concerns. SMEs frequently do not have the resources to respond to market opportunities, nor the capacities to access already available sources of funding. In addition, accessing funding from EU financial mechanisms can have a very high

administrative burden, while these mechanisms do not provide opportunities for companies focused on export markets.

Market opportunities

The global water market is a huge economic opportunity. Financing to support innovations is an enabler, for the regional as well as the global market. Demonstration of new technologies on Incubator Platforms increase visibility and acceptability of new products.

Objective

The overall objective for financing for innovation is to explore, develop and implement new approaches to increase financial flows in the water sector, with three priorities:

- Improve access to finance for SMEs, especially those with potentially disruptive technologies.
- Incentivize public sector innovation, notably through public procurement, support to the pre-commercial phase of new technologies and increasing overall financial flows to the sector by applying appropriate cost recovery principles.
- Financial support mechanisms for European companies in water-related export markets.

Initial Actions

The Steering Group of the EIP Water invites Action Groups to develop and test:

1. An EU wide common structure to build interfaces between funders, industry, companies, SMEs and research organizations to foster relationships promoting innovation and improve knowledge about access to finance.
2. Options to improve access to finance for SMEs active throughout the water cycle, especially those with potentially disruptive technologies and those with high export potential.
3. Frameworks and instruments to stimulate public sector innovation in the priority areas identified by the EIP, based on a review of public procurement best practices in relevant sectors of industry in Europe and other OECD countries.
4. Innovative financial instruments at an EU level to support European companies proposing innovative goods and services and to facilitate access into overseas water sector export markets in line with the objectives of the EIP.

4.9. SMART TECHNOLOGIES

Challenges

Smart Technologies are highly efficient, interdisciplinary technologies that enable a step change in the water domain. Intelligent Sensors and steering devices enable to operate the infrastructure in a more flexible manner in changing urban settings. They can include e.g.

process or information technologies at varied levels of technology readiness. Smart technologies have their impact on all the selected EIP Water priorities.

Bottlenecks

Important barriers for innovation in this area are the lack of knowledge of new technologies and its capabilities, risk-aversion, a lack of launching customers, as well as a fragmented sector.

Market opportunities

Based on the very high life expectancy of water and wastewater treatment facilities as well as drinking and wastewater networks in the range of typically 30 to 100 years, substitution market opportunities are available but market uptake velocity will be moderate. Smart technologies can be introduced while retrofitting existing installations in Europe, or building new infrastructures in emerging countries. The adequate technologies, market drivers and accompanying measures may differ.

Objectives

Overall objectives are to increase efficiency, (in terms of cost, energy and resources) of process and information technologies applied in the EIP Water priority areas. This requires adequate research and investment, which will be guided by a living, yearly updated portfolio of effective technologies of varying readiness. The methodology to build, update and execute this portfolio will have to be developed. This should lead to an increase of EU and export markets in smart water technologies by 25% in 2020. This will also lead to increased cost-efficiency (30% improvement by 2020). As an enabler, it is linked to meeting technology-dependent objectives within the priority areas.

No separate actions are defined for Smart Technologies, as they are identified as a key enabler for the EIP Water priorities. Smart Technologies have been integrated in the actions of the priorities, where applicable.

5. EIP WATER IMPLEMENTING ACTIONS

The EIP Water is an activity driven initiative, stimulating concrete actions towards meeting the objectives for each priority area. These actions will deliver recommendations at the EU and national level on how to improve the facilitation of innovations and bringing them to the market. These actions try to balance short-term wins with longer term objectives. They provide an opportunity to capitalize on already on-going innovations and existing initiatives, while offering opportunities to exploit synergies within and across the different priorities and perspectives for longer-term research and development.

The members of the Steering Group are committed to contribute to these key actions, in cooperation with other relevant stakeholders and by initiating activities in the 1st half of 2013 to achieve first results in 2014-2016.

5.1. ACTION GROUPS

The Action Groups will be the core of the implementation of the EIP Water. Action Groups are invited to commit to work on one, or more, actions as described under the EIP Water priorities in this SIP. Action Groups are expected to report on an annual basis on their

progress and on the bottlenecks/barriers they encounter in their activity and which solutions they propose to overcome them. Reporting will be done to the Task Force to ensure that the experiences of the Action Groups will not remain isolated, but can be disseminated and translated into policy recommendations.

Action Groups should be formed along the rationale of the EIP Water, including various disciplines for innovation (e.g. research, industry, finance, NGO, ICT, etc.), as well as the demand and supply sides of innovation. Where possible, an international composition will be encouraged.

There will be a call for expression of commitments to form Action Groups twice a year to keep the possibility to start new Action Groups and integrate upcoming initiatives in the EIP Water over time and to respond to potential adjustment of the SIP.

5.2. TASK FORCE ACTIVITIES

The EIP Water Task Force will work on identifying best practices and barriers to innovation, developing policy recommendations, promotion of project portfolios and communication and dissemination strategies. A preliminary analysis has provided the following suggestions for activities that could be undertaken by the Task Force. The Task Force will determine its own priorities and the scope of the activities.

Activities	Possible topics
Identify best practices	Financial mechanisms to support innovative SMEs Public procurement systems in Europe and other OECD countries Venture Capital and other (non)financial mechanisms to support innovative SMEs
Identify barriers/ bottlenecks	Inventory of existing regulation blocking innovations and smart technologies Lowering the administrative burden to access financing for innovation by harmonising regional, national and EU procedures. Governance structures
To aggregate and promote project portfolios	Establishing a project preparation support facility for projects outside the EU combining innovative PPP solutions with blended financial instruments Develop a living, yearly updated portfolio of promising and disruptive innovations for effective technologies of varying readiness levels Develop and implement a EU-wide common & consistent certification for new water-related technologies Increase efficiency of funding smart technologies in an innovation readiness table by a to be established industry-led advisory body

Activities	Possible topics
Advise on needs for policy development and funding	EU-wide common & consistent certification for new water-related technologies to reduce time to market & eliminate barriers Coordination and integration of objectives of different legislations to boost eco-innovation Water reuse and recycling; recommendations to harmonize EU-level water qualities for different uses Introduction of resource recovery in relevant legislation Improving the water-energy policy link Innovative water pricing policy Financing instruments for long term innovation Increase efficiency of funding smart technologies
Communication and dissemination strategies	For EIP Water outcomes and awareness raising among the general public

5.3. TOOLS

The EIP Water will develop tools to support water related innovation. These tools will not necessarily be linked to the priorities of the EIP Water, but will be open to any actor dealing with water and innovation. Tools that will be developed from 2013 onwards are:

Annual EIP Water meeting

An annual EIP Water meeting, opened to a wide audience, will be organized to present the activities of the Action Groups and the progress in implementing the EIP Water tools and activities as well as a brokerage event between water innovation supply and demand.

Web Based Market Place

The objective of the web based market place is to create and establish a community on and a place for “matchmaking” in innovation topics in the field of water in Europe and worldwide, connecting problem owners and owners of solutions, regardless of their geographical position. The market place will offer several features, driven by the stakeholders' interests.

Other potential tools

Other potential tools, to be further developed by the Task Force or by designated Expert Groups include:

- Booster teams to support innovation activities of SME's;
- Trade missions to showcase EIP Water outcomes
- Innovation Competitions and an Innovation label to foster visibility, market application and public awareness

- Regional, national and/or international water innovation platforms to initiate dialogue and cooperation between relevant stakeholders

- Finance related tools, including a water innovation fund to bring viable business cases to the market, incentives for public procurement, financial instruments for export opportunities and development of a technology risk guarantee mechanism

- Tools to stimulate the development and dissemination of smart tools in line with the EU Open Data policy and Digital Agenda

- Dissemination tools to present showcases to policy makers and end-users and create social acceptance for recovered resources

6. NEXT STEPS

The Task Force will meet in the first quarter of 2013 to agree on an operational plan, further specifying the implementing actions.

The Steering Group invites the European Commission to respond to this Strategic Implementation Plan in the 1st half of 2013, and present the SIP for discussion in the European Parliament and Council.