

Water JPI Submission to the European Call for Ideas on Large Scale Demonstration Projects

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The Water Joint Programming Initiative (JPI) follows with a lot of attention, progress in the preparation of the upcoming 2016/ 2017 work programme of Horizon 2020 Societal Challenge 5. With this purpose, a specific Task Force comprising a number of representatives from the Water JPI was set up in 2014. This Task Force has two main objectives, namely: a) Identifying specific opportunities to provide input to the European Commission on the content of Horizon 2020 work programmes; and, b) writing-up of position papers and responses to relevant European public consultations.

A response to the European public consultation on Societal Challenge 5 of Horizon 2020 was sent to the Commission in June 2014¹. A number of specific research and innovation themes included in the Strategic Research and Innovation Agenda (SRIA 1.0) at the time under preparation were then proposed. All the themes included in that response were selected upon their contribution to tackling specific scientific challenges whilst responding to socioeconomic needs (in particular, economic growth, employment, social equality, etc.)

The Water JPI members acknowledge the importance of keeping strong links with the European Commission due to the significant role that the latter plays in the definition and implementation of the SRIA. This objective has been recently underlined by the new President of the Water JPI (Maurice Héral, ANR, France) and shared by all member countries during the last Governing Board of the initiative in November 2014. To this end, and in line with the activities initiated at the very early stages of the initiatives by the former Water JPI coordinator (Enrique Playán, Spain), **this short paper provides a list of possible topics from the Water JPI's SRIA that could be of interest for large scale demonstration projects.** Additional details will be provided in a separate document.

I. Contribution to the call for ideas on large scale demonstration projects

The Water JPI welcomes the support of Horizon 2020 to demonstration projects. Demonstration projects will enable the large-scale testing and replication of research products and services in real world applications, thereby moving research products and services closer to their market implementation and commercialisation. Having recognised its significant role in the success of Horizon 2020, the Water JPI is very much concerned about the budget available for collaborative projects within the framework programme. The fact that pillar 3 of Horizon 2020 will advantage innovation-oriented projects and large-scale demonstration projects implies that, especially in a budget-restrained context imposed by the new Juncker Commission, research

¹ <http://www.waterjpi.eu/>

collaborative actions will be restricted to a few instruments within Horizon 2020 and the calls launched by the JPIs. In our view, the strong focus of future calls on demonstration and innovation will impair sustaining a good European research base, necessary for the emergence of future innovation projects.

The Water JPI SRIA 1.0 includes a number of topics that could be of interest for large-scale demonstration projects in the next work programme. Such topics have been selected according to the following criteria:

- Contribution to developing and testing innovative approaches, methodologies and/ or techniques representing a high degree of novelty, either novel technology or novel application or – even both.
- Clear focus on demonstration objectives; topics here proposed do not include any research activities as all of the necessary knowledge must be available for the proposers to implement the demonstration project.
- Inclusion of both technology producers and project results users (i.e. industry, researchers, authorities, etc.).
- Pre-competitiveness level. Technologies/ products already on the market for the same application cannot be demonstrated.
- Level of Urgency (Short/Medium/Long-term).

| Ref. | Title |
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| 1 | Developing innovative (or improved) tools for the protection and prevention of hydro-climatic extreme events |
| 2 | Improving water management to mitigate the harmful impacts of extreme events (extreme weather events, impaired water quality); in particular: setting-up risk-management strategies, and improving the short-to-medium term forecasting of related extreme events |
| 3 | Progressing towards urban flood proof cities, including developing and setting up technological and managerial solutions to urban floods; producing integrated systems for the prediction and risk management of urban floods |
| 4 | Assessing the impact of water scarcity on safe drinking water, including developing and setting up technological and managerial solutions to urban droughts, producing integrated systems for the prediction and risk management of urban water scarcity; developing smart innovations to tackle water scarcity in the city. |
| 5 | Developing innovative, affordable sensors and detection systems, remote control systems, data networks, intelligent methods and DSS to manage (monitor and control) water distribution and wastewater networks. |
| 6 | Developing, testing and evaluating innovative and efficient irrigation systems and practices combining crop water requirements, crop physiology, ground-based sensors, imagery satellite, ICT, and expert systems. |
| 7 | Promoting adaptive water management for global change: Assessing the impacts of extreme weather events and global change on the water cycle and uses; developing and testing improved plans and methodologies for adaptive water management in relation to global change. Methodologies will be tested on relevant cases using scenario development, uncertainty assessments and pilot |

- experiments.
- 8** Improving water systems performance, including developing technologies for the monitoring of water losses and water consumption, developing solutions for decentralised treatment and water management, and promoting the sustainable use of storm waters and groundwater, and drainage in cities.
- 9** Developing water reuse and recycling technologies and concepts
- 10** Recovering products from treatment plants: Technologies aimed at reducing gas emissions in treatment plants, development of new and eco-friendly materials, sustainable management of urban waste and recycling of raw materials, holistic control approaches aimed at optimising water quality, energy and resources recovery.
- 11** Promotion of water RDI infrastructures: Establishing a European research infrastructure supporting up-scaling of water flow (runoff and groundwater), reactive transport and ecosystems to the relevant scale in order to facilitate policy implementation and assist scientists worldwide. Research infrastructure can be physical infrastructure (e.g. experimental catchments or field labs) or virtual databases/exchange platforms (to guarantee long-term records). Databases should be comprehensive, easy to access and interoperable. Advances in the up-scaling of theories and tools are needed.
- 12** Implementing Managed Aquifer Recharge (MAR): Planning, operation, risk assessment and management.
- 13** Mitigating water stress in coastal zones. Developing a systematic approach to comprehensive coastal zone management based on monitoring and modelling. Integrate the different uses on coastal zones to prevent water quality and quantity degradation. Demonstrating the feasibility of Aquifer Storage and Recovery by using various sources of water. Evaluating inter-seasonal freshwater storage possibilities in existing aquifers. Developing novel geophysical and hydrogeophysical models for characterisation of water bodies at a finer scale. Models will include water supply and demand-scenario builders and DSS. Monitoring and dynamic modelling of artificial recharge and natural infiltration.