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Theme 6: ENVIRONMENT (INCLUDING CLIMATE CHANGE)

ENV.2013.WATER INNO&DEMO-2: Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers:

b) Promotion and development of innovation-oriented public procurements in the domain covered by the proposed European Innovation Partnership on 'Water' [...]



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D2.5 Policy recommendations to the EIP



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Authors: Umberto Fratino, Carlo Gadaleta Caldarola (ARTI)

Reviewers: Laura Carpineti (ARCA), Sara Bedin (TEHA), Michiel Blind (Deltares), Milo Fiasconaro (APE), Jonathan Abra (KTN), Michele Chieco (Regione Puglia), Dick de Kreek (Gemeente), Pedro-José Bueso Guillén (UNIZAR), Gabriella Gyori (ICLEI), François Touchais (OIEau).

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PP	Restricted to other programme participants (including the Commission Services)	
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2 Scope

The Water PiPP project was designed for exploring Innovation Oriented Public Procurement (IOPP) methodologies and for testing their applicability in the water sector. More specifically, the Water PiPP project was aimed to find the way in which all the new IOPP approaches, including PPI (Public Procurement of Innovative Solutions) and PCP (Pre-Commercial Procurement), can be implemented, managed and used to bring the policy and the Research Development & Innovation investments to the market of the water sector.

This document concerns deliverable (D.2.5) of the second work package titled "*Involving the key stakeholders of the Innovation Procurement Chain*" and it is intended for suggesting policy recommendations to the European Innovation Partnership on Water (EIP Water).

The EIP Water is an experimental, demand-driven, and flexible initiative within the framework of the EU2020 Innovation Union; its overall objective is to facilitate the development of more innovative solutions to the new water challenges (Schmidt et al, 2016). EIP Water identified the removal of persisting barriers and bottlenecks to innovation in the European water sector as an urgent action, prioritising changes in funding schema, public procurement, set-up of partnerships, regulation, and improved dissemination.

3 Position of the problem

This document deals with public procurement of innovation, which is a demand-side innovation policy instrument in the form of an order, usually placed by a public authority for a new or improved policy/approach/product to fulfil its particular needs¹; it aims to contribute to the understanding of public procurement of innovation in the water sector, including its operationalization and implementation.

Dealing with IOPP, it is important to distinguish: 1) the policy of using public procurement to spur innovation as part of demand-side policies and 2) the public procurement practice that aims to solve a specific societal problem or improve a certain public service and in doing so asks for (and commits to buy) something new.

In the case of IOPP applied to the water sector, this distinction could be interpreted as follows: the demand-side innovation policy instrument is a systematic attempt by public entities to mobilize the purchasing power of the state/regional/local organizations for innovation policy goals, whereas IOPP as practice is a necessary mean for achieving societal, environmental and technical goals not necessarily related to innovation policy.

Traditionally, innovation solutions have come mostly from the supply side. Generally, the role of demand as an enabler and source of innovation has been a topic in innovation studies and innovation policy. Recent interest in demand-side approaches to innovation policy is shown in documents such as *'Invention and Transfer of Environmental Technologies'* (OECD, 2011) or in new actions at the EU level as 1) the EAFIP service carried out by the DG CNCT (www.eafip.eu) and 2) the inclusion of the PPI and PCP financing projects in H2020 calls. Because public procurement of goods and services accounts for 19% of Europe's GDP (Rolfstam, 2014), it can be seen that public procurement has the power to foster innovation and use it to better address the needs and challenges of public services.

Taking into account also the deliverable 2.2 of the Water PiPP Project – *"Consensus workshop report"* (EU Water PiPP, 2015), a generic 'framework' of guidelines on water sector innovation-oriented public procurement is recommended, in order to 'guide' the procurement at national as well as sub-national level.

The implementation of IOPP across the water sector is seen as crucial to addressing challenges relating to water quality and quantity in Europe. Water problems are increasingly globalised, requiring focus at a range of scales, from local responses to global strategies. Furthermore, these challenges are projected to increase due to climate change, socio-economic developments and

¹ Public procurement for innovation occurs when a public organization places an order for the fulfilment of certain functions (that are not met at the moment of the order or call) within a reasonable period of time through a new or improved product. Hence, the objective of IOPP is not primarily to enhance the development of new products, but to target functions that satisfy human needs, solve societal problems or support agency missions or needs.

increasing water demand in agriculture to support essential ecosystem services such as food supply and development of a bio-based economy.

Innovation has a pivotal role to play to enhance/increase efficient uses of water, cut costs, and sustain ecosystems. 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 SMEs are active and where there is strong potential for job creation. Moreover, the costs of inaction are significant in terms of losing global market business opportunities for the European industry.

The European water sector is fragmented and this creates problems; EU instruments focusing on the innovation supply side are not always adequately linked to demand side actions and financial instruments. Hence, it is necessary that time-to-market should be shortened, with innovation support actions at EU and national level (i.e. reviewing regulations and proposing new rules, accelerating product approvals, fast-tracking standard settings, removing unnecessary financial guarantees, etc.).

Moreover, in the case of the water sector, to prevent further obstacles to the implementation of innovative solutions, the evaluation of environmental performances of the innovation process must be accompanied by an assessment of the potential global and local environmental effects.

According to this, in order to fully exploit the opportunities for innovation in the water sector and the related sectors and industries, the EIP Water recognized that a European strategy and support actions are needed. These should complement national and regional activities and secure synergies among them, while also including local perspectives. This is demonstrated by the fact that the opportunities for economic growth through facilitating innovation are being recognized and have been placed at the heart of the Europe 2020 strategy (European Commission, 2010).

4 Barriers and opportunities

The full exploitation of European innovation capacities with regard to water challenges is hindered through persistent bottlenecks and barriers (EIP Water, 2014). With regard to the public procurement, the water sector faces problems with respect to balancing cost reductions against quality of supply and service, taking into account that the public sector tends to be highly regulated, and as a consequence, strongly constrained². For this reason, in the past, the water sector has viewed procurement as a predominantly clerical activity and has based purchasing decisions primarily on the issue of cost. This is why it is usual to speak about ‘conservative procurement’ in the water sector, where preference is given to low/lowest cost offers, neglecting longer-term operational or lifecycle costs, and to well-known and reliable technologies, which hampers the innovation processes.

Nowadays, in the water sector, the importance of procurement of innovation is recognized and procurement of innovation increasingly plays a strategic role within public sector organizations. This change has been driven by increasingly complex product choices, increased use of technology, a switch in focus from cost to best value and an increased consideration of environmental issues.

Despite this, public sector procurement is still largely focused on reducing costs and fails to consider the total acquisition costs. Academic focus in the area has largely been based on the private sector and on conceptual frameworks. Moreover, problems arise due to the low intensity of cooperation between the various sectors of the water related value-chain and thus potential synergies are not recognized or realized. In most cases, water utilities are relatively small and do not collaborate or cooperate in procurement processes, lacking the capacity to do so. Water management at national, regional or local level in Europe does not facilitate the implementation of innovative solutions, mainly because of fragmentation of approaches, lack of critical mass for investments and insufficient market size.

Considering that EU procurement rules have been recently changed³, IOPP will be more effective to identify best practices and develop new organization models, which can better deal with the existing rules. The lessons learned from the recent EU-wide debate about public procurement rules and public services must be considered. The societal dimension of the Horizon 2020 program (Safe and Secure Societies) gives opportunities to implement research to better understand consumer’s reactions and needs.

² Indeed, taking an “economic” risk for a public operator may even be substantially blocked by public accounting rules. In other words, in most cases, public operators do not have a mandate to innovate per se and to undertake risky activity with public money.

³ In January 2014, the European Parliament proposed new directives on public procurement. In addition to considering the lowest price in the procurement, other dimensions are now important in the selection of contractors: quality, sustainability, social conditions and innovation. The decision includes a new procedure called innovation partnerships. Such partnerships make possible collaboration between the procuring organization and suppliers in order to achieve the objectives of the procurer.

5 Collaboration and coordination as tool for fostering policy innovation in water sector

It is important to understand that IOPP can be characterized by different degrees of collaboration and interactive learning among different actors (politicians, procurers, suppliers and R&D institutions).

IOPP in the water sector requires effective coordination within administrative functions and units to accommodate their different targets and incentive structures. Both horizontal and vertical coordination is called for. In particular, horizontal alignment is needed between sector agencies and innovation policy organizations, whereas a vertical alignment is searched among politically elected policy-makers, water management and operational level. From the policy-makers' perspective, coordination is needed to ensure that the identified societal challenges are translated into appropriately framed IOPP projects. From an operational perspective, effective communication efforts are required to obtain the necessary buy-in for the higher level of risk-taking involved with the water sector.

Although the internal motivation to improve performance is primarily driven by its potential economic benefits, the organizations operating in this sector are also facing increasing external pressure arising from legislation that governs the effects of their actions and imposes targets.

In order to overpass these intrinsic difficulties, the implementation of the hybrid Triple Helix model (Etzkowitz, 2003) could represent a win-win strategy for fostering IOPP in the water sector. This model describes the different degrees of collaboration between the three main actors involved in innovation, namely government, research, and industry, starting from the idea that, when each helix (actor) is linked to each other, the overall value of collaboration is strengthened. Therefore, collaboration with industry is likely to increase pressure for short-term research, thereby negatively affecting long-term basic and curiosity-driven research.

6 Policy recommendations to the EIP Water

Collaborative efforts of actors are capable of delivering greater overall benefits than if each were to pursue their own goals individually, the primary challenge being the alignment of the needs and expectations of each of the actors. The water sector can appear highly conservative. Regulations and rules to ensure financial probity and competitive tendering have restricted the development of closer supply relations and social capital by setting out rigid bureaucratic procedures.

In order to better balance transparency, value for money and relationship development; we believe in creating a sector culture which is risk-averse and resistant to change, with low levels of procurement expertise and a lack of collaboration., by taking into account that:

- a) **IOPP as an innovation policy instrument** must be based on a good understanding of the challenges at the organizational level and the different interests at different policy levels. Even if large innovation procurement initiatives in the water sector may make a difference, the real difference is made if the whole innovation system is uplifted, if all levels understand the issues involved, and if the public sector puts emphasis on and opens debate with multiple stakeholders in order to deal with those issues.
- b) **IOPP as a “Demand Side” innovation policy** must be based on a good understanding of the public need for absorptive and innovative capacity, and thus develop systemic approaches. IOPP must be embedded into a range of actions, from both demand and supply sides that provide the conditions necessary for improved effectiveness in mitigating social and/or environmental demands.
- c) **IOPP in the water sector** must be able to ensure that the challenges identified at the practice level can be overcome by actors at all levels: by those implementing procurement initiatives, by those supplying them and by those benefiting from them. Tackling societal challenges in isolated large-scale IOPP initiatives will not deliver the breadth needed. Therefore, IOPP must be understood not as an ensemble of large initiatives, but as a systemic roll-out of schemes, instruments and framework conditions that overcome those challenges across the system.

Based on the findings in Water PiPP, we recommend to embed IOPP in organization’s strategies thanks to the following levers:

1. **Consider multiple policy goals and user needs.** It is necessary to address, at the same time, sectorial policies on water, energy, transport, tourism, waste management and so on, which were inspired by different societal challenges of sustainability and of economic competitiveness respectively. To ensure valuable inputs to the selection process and to maintain support for such a multi-purpose IOPP from all stakeholders, it is important that a well-structured IOPP organization is set up.

2. **Increase IOPP expertise within public organisations.** Setting functional requirements, assessing solutions, demanding the right information and coordinating the IOPP process requires both in-depth and broad expertise. Particularly when multiple sectorial policy goals are pursued, expertise in all relevant fields is due. While a significant amount of expertise can be outsourced, a public organization needs to develop such expertise in-house⁴. Policy makers shall support in-house capability building of public procurers.
3. **Specify functional requirements.** It is important to anticipate that during developmental R&D-intensive IOPP, not enough information may be available to select a winning design after one stage. Therefore, policy makers should, in such cases, use multiple selection stages and specify this in advance so that potential suppliers can consider this in their decision to participate⁵. Furthermore, the evaluation of performances of the innovations must be accompanied by an accurate assessment of the potential global and local environmental effects, also to prevent obstacles in EIA procedures.
4. **Enhance competition.** Before a multi-stage IOPP procedure, policy makers may establish cooperation among public entities facing similar problems. At the PCP level they must enhance competition at all stages of the procurement phase, which optimizes further development of the selected solution(s) through complementary expertise and learning by interaction windows within the competition framework.
5. **Build IOPP capacity:** As recommended in the Consensus Workshop Report (EU Water PiPP, 2015), authorities must enhance a learning process on both PCP and PPI and on the new opportunities provided the EU legislation. Moreover, it is considered of crucial importance to engage contracting authorities, suppliers and co-financers in product development and testing process.
6. **Consider risks.** Innovation in the water sector may result in high societal cost of a possible innovation failure. Because private actors have different risk perceptions or cannot finance all the excessive costs of a failing innovation, public actors should better carry the risk of the innovation⁶. Hence, the procurers in water sector should carry more of the risk of innovation than in innovation policy and mission-oriented policies.
7. **Clarify Intellectual Property Rights.** The IPR issues and society's concerns regarding water as a public good must be better considered. For example, the differing perspectives on intellectual property between industries and universities could represent a potential source of conflict, with entrepreneurs finding it difficult to figure out the academic ontological

⁴ When as in case of small organizations this may not be possible, it might be suggested to create a separate national organization that can develop and offer advice to procuring organizations, particularly on matters of innovation procurement and functional procurement.

⁵ For example, during the first selection stage, functional requirements should be broad to stimulate creativity and enable a broad range of solutions, whereas during the subsequent stages, functional requirements should iteratively become increasingly specific, using knowledge that is developed in response and parallel to the proposed solutions.

⁶ One of the roles of government within the hybrid Triple Helix model is to encourage industry and universities by minimizing the risk of partnership building with a strong scientific base.

principles related to the universality of knowledge that do not coexist well with private property values.

8. **Support Pre-Commercial Procurement.** Since PCP deals with the procurement of (expected) research results, it should be considered as public R&D investment and not product development. This public R&D funding is very problem-oriented and targeted, as opposed to general public R&D funding or tax deductions that industries can make for their R&D expenditures.

Reflecting on these policy recommendations, it is important to highlight some interdependencies.

It appears that expertise within public agencies operating in the water sector is relevant to all other lessons on IOPP. Expertise is crucial to drafting the right functional requirements and to modify these over successive tender stages as sufficient knowledge is not available at the outset of the procurement process. Moreover, expertise is key to assessing how the procured innovations contribute to the plurality of policy goals, how to combine these goals and how to manage a diverse array of stakeholders. Expertise is furthermore important to strike a good balance between competition and constructive, in-depth cooperation. Finally, in-house expertise is crucial to reliably assess the risks of innovation, which is particularly important in the water sector, where failure of the procured innovation could generate large problems.

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The Water PiPP project was designed for exploring Innovation Oriented Public Procurement (IOPP) methodologies and for testing their applicability in the water sector. This document aims to contribute to the understanding of public procurement of innovation in the water sector, including its operationalization and implementation.

The implementation of IOPP across the water sector is seen as crucial to addressing challenges relating to water quality and quantity in Europe. The European water sector is fragmented and this creates problems; EU instruments focusing on the innovation supply side are not always adequately linked to demand side actions and financial instruments. According to this, in order to fully exploit the opportunities for innovation in the water sector, the EIP Water recognized that a European strategy and support actions are needed (EIP Water, 2014)..

The full exploitation of European innovation capacities with regard to water challenges is hindered through persistent bottlenecks and barriers. The water sector can appear highly conservative. Regulations and rules to ensure financial probity and competitive tendering have restricted the development of closer supply relations and social capital by setting out rigid bureaucratic procedures. This has resulted in imbalance between transparency, value for money and relationship development; creating a sector culture which is risk-averse and resistant to change, with low levels of procurement expertise and a lack of collaboration.

However, nowadays, in the water sector, the importance of procurement of innovation is recognized. This change has been driven by increasingly complex product choices, increased use of technology, a switch in focus from cost to best value and an increased consideration of environmental issues.

IOPP in the water sector has to take into account that:

- a) IOPP as an innovation policy instrument must be based on a good understanding of the challenges at the organizational level and the different interests at different policy levels.
- b) IOPP as a “Demand Side” innovation policy must be based on a good understanding of the public need for absorptive and innovative capacity, and thus develop systemic approaches.
- c) IOPP in the water sector must be able to ensure that the challenges identified at the practice level can be overcome by actors at all levels: by those implementing procurement initiatives, by those supplying them and by those benefiting from them.

Based on the findings in WaterPiPP, we recommend:

- 1) Consider multiple policy goals and user needs.
- 2) Increase IOPP expertise within public organisations.
- 3) Specify functional requirements.
- 4) Enhance competition.
- 5) Build IOPP capacity.
- 6) Consider risks.
- 7) Clarify Intellectual Property Rights.
- 8) Support Pre-Commercial Procurement.

Reflecting on these policy recommendations, it is important to highlight some remarks.

The expertise within public agencies operating in the water sector is relevant to all other lessons on IOPP. Expertise is crucial to drafting the right functional requirements and to modify these over successive tender stages as sufficient knowledge is not available at the outset of the procurement process. Moreover, expertise is key to assessing how the procured innovations contribute to the plurality of policy goals, how to combine these goals and how to manage a diverse array of stakeholders.