# Policy Brief

## Standardisation and Interoperability: Leveraging the benefits of Digitalisation in Industrial Water Systems

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AquaSPICE is an EU-funded project (Horizon 2020) that brings together 27 partners from 12 countries and aims at materialising circular water use in European process industries, fostering awareness in resource-efficiency and delivering compact solutions for industrial application. The project aims to reach this objective through the development and validation of water efficiency management and optimisation methodologies, technologies and tools; the creation of a water-specific cyber-physical system; and the definition of effective methodological, regulatory and business frameworks.

The following table outlines key recommendations aimed at enhancing the digitalisation and standardisation of water management within the industry.

Table 1 – Main Recommendations of AquaSPICE

| **MAIN RECOMMENDATIONS** |
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| • **Encourage the implementation of the Water Efficiency Framework (WEF).** The WEF [1]fosters a holistic approach to assessing and elevating water efficiency through digital and technological advancements. **Foster collaborative approach among the different stakeholders** to develop the relevant innovative solutions, facilitate knowledge sharing and adoption of the solutions by industries.<br>• **Support active engagement with standardisation organisations such as ETSI, ISO, CEN to be updated with emerging industrial standards.**<br>• **Encourage the implementation of standards and interoperability frameworks such as FIWARE in real-world scenarios** to enhance efficiency, reliability, and scalability in water management practices.<br>• **Encourage the integration of SAREF Ontology,** developed by ETSI[2], to facilitate the semantic interoperability. |

## 1.1. Introduction

**Building on the recommendations from the Standards Development Organisation (SDOs), various standards, and research from sister projects[3], AquaSPICE has developed recommendations aimed at promoting better harmonisation and compatibility among various components and systems in the field of smart water management.** These recommendations are aligned with the objectives outlined in the current Rolling Plan for ICT standardisation. Co-developed by the European Commission and the Multi-Stakeholder Platform (MSP), this document serves as a key reference in Europe for linking EU policies with ICT standardisation activities.

**In its report on interoperability and standardisation[4], AquaSPICE points out seven general recommendations to facilitate interoperability in smart-water management in industry,**

[1] AquaSPICE, D1.6 b – Water Efficiency Applications Framework for the Process Industry.
[2] AquaSPICE, D1.5 – Data Models, Taxonomy and Ontology Industrial Water Use
[3] Ultimate, B-Water-Smart, Rewaise, Water Mining, Wideruptake
[4] AquaSPICE, *D7.9 interoperability and Standardisation,* May 2024.

and proposes three recommendations based on its analysis and also looks at future actions related to the digitalisation of water management. These recommendations could contribute to the update of this plan and accelerate the achievement of a Water-Smart Society[5].

**These recommendations could also contribute to the EU-wide Action Plan on digitalisation of the water sector that key solution providers request.** These companies also underline the need to accelerate the implementation of the EU water acquis via the deployment of digital tools[6]. This perspective is also shared by the EU Commission in its perspectives on the future Water Resilience Strategy that should "*include proposals to digitalise water management, cycles and utilities*."[7]

## 1.2. Detailed Recommendations

Below, the six recommendations have been developed with the objective to contribute to better standardisation and interoperability of smart water management in Europe by various projects. These recommendations are/have been applied successfully in the following programmes:

- AquaSPICE has developed the RTM (Real-Time Monitoring) tool to optimize water management by integrating real-time data. The tool leverages the FIWARE platform, using its smart data models and open standards to ensure interoperability and enhance resource efficiency in water reuse across industrial processes.
- B-WaterSmart is an advanced project in applying standardisation and interoperability practices, using the FIWARE platform to harmonise data under smart data models created based on the NGSI-LD standard. B-WaterSmart creates an interoperable ecosystem that supports water reuse and resource recovery.
- ULTIMATE have conceptualised interoperability by using the WSIS ontology based on SAREF, though they have not yet implemented an interoperable system, providing an example of how AquaSPICE benefits from further fostering integration with existing ontologies and frameworks.
- WATERVERSE project focuses on digitalising water management using IoT, smart sensors, and Big Data for real-time monitoring. The project emphasises interoperability and open standards for efficient water resource management.

### 1.2.1. Encourage the implementation of the Water Efficiency Framework (WEF).

The Water Efficiency Framework (WEF)[8] provides a structured approach to enhance industrial water efficiency by integrating process, circular and digital innovations. Its phased methodology supports industries in reducing freshwater intake, optimising

[5] A Water-Smart Society means: (Water Europe 2024)
[6] AutoDesk and co, *Leading Innovators call on EU policymakers to Foster Uptake of Digitalisation for a Water Resilient Europe*, Brussels, October 2024.
[7] European Commission, Commissioner for Environment, Water Resilience and a Competitive Circular Economy: Mission letter, 17 September 2024
[8] AquaSPICE, D1.6 b – Water Efficiency Applications Framework for the Process Industry

wastewater reuse, and implementing real-time monitoring for improved resource management. By fostering adaptive strategies, the WEF ensures resilience in water use in the process and food processing industries, while aligning with EU sustainability goals.

### 1.2.2. Foster a Collaborative Approach Among Stakeholders

Collaboration is crucial for developing innovative solutions that address water management challenges. By engaging industry, academia, and policymakers, AquaSPICE promotes knowledge exchange and accelerates the adoption of sustainable practices. Collaborative approach goes also through:

- The adoption of open standards and specifications whenever possible to facilitate transparency, accessibility, and compatibility across different systems.
- Clusters activities, such as ICT4Water Cluster, are extremely valuable to leverage diverse perspectives and expertise.
- Dissemination and documentation of best practices to foster smart water management and promote consistent approaches of standardisation.

### 1.2.3. Support Active Engagement with Standardisation Bodies

Active participation with standard organisations such as ETSI, ISO, and CEN is essential to align project outcomes with industry-wide standards and to influence future regulations. Projects, such as AquaSPICE, should be encouraged to engage with the organisation to foster standardisation during their RT&D activities as well as after the completion of the project. It will facilitate the knowledge sharing between future projects and potentially strengthen the interoperability within water management.

### 1.2.4. Promote Implementation of Interoperability Frameworks such as FIWARE

Leveraging FIWARE's Smart Data Models supports data harmonisation across IoT ecosystems. These models facilitate the integration of diverse data sources, enabling efficient monitoring and decision-making. The Real Time Monitoring (RTM) platform is based on FIWARE technology and its standards. This RTM has been tested and deployed in all AquaSPICE case studies. Given the versatility and compatibility of the FIWARE platform with diverse smart data models, FIWARE offers a robust ecosystem of open-source components and tools that can facilitate seamless integration and interoperability across heterogeneous systems and data sources for European industrial stakeholders.

### 1.2.5. Integrate the SAREF Ontology for Semantic Interoperability

AquaSPICE advocates for the integration of the SAREF ontology, developed by ETSI, to enhance semantic interoperability. This approach ensures consistent communication between IoT devices and facilitates smarter water management solutions. This ontology is also compatible with FIWARE’s models.