iWAYS

innovative water recovery solutions

Policy Brief

Authors: Water Europe

March 2023

Contents

Disclaimer

Due to the ongoing research activities and the confidentiality of some data, the project cannot disclose all the information that confirms the recommendations. Moreover, some data remain provisional. The project consortium can be contacted via luca.montorsi@unimore.it to get the information in the respect of this confidentiality framework.

Executive Summary

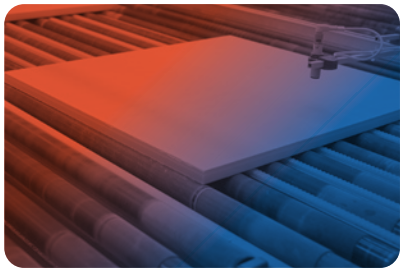
This policy briefs aims to stress the activities and expected outcomes of the EU funded project iWAYS– Innovative WAter recoverY Solutions through recycling of heat, materials and water across multiple sectors – in the context of the recast of the industrial emissions directive. The project is working on innovative solutions to recover water and heat and in some cases materials from exhaust streams. The consortium is also developing digital solutions to deploy these solutions in other industrial sectors. In the contact of the European Institutions' agenda, this project provides good example and recommendation to ensure a better consideration of water-related challenges in a modern Industrial Emissions Directive.

iWAYS – **I**nnovative **WA**ter recover**Y** **S**olutions through recycling of heat, materials and water across multiple sectors

3 Sectors Dealing with the Value in Water from Exhaust Streams

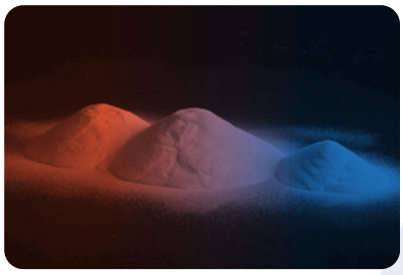
iWAYS – Innovative WAter recoverY Solutions through recycling of heat, materials and water across multiple sectors – is a EU funded project under grant agreement N958274, aiming at developing a set of technologies and systems for industrial processes in order to recover water heat, and in some cases materials, from exhaust streams. The project provides water-smart solutions to recover water, recycle heat, materials across multiple sectors. It will also contribute to the reduction of CO_2 emissions, water pollution and the exploitation of the value in water.

The project is working with three demo cases in three different countries and industrial sectors:



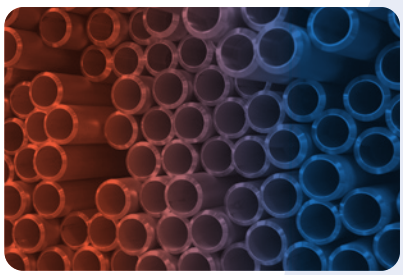
Ceramic industry

Ceramiche Atlas Concorde, Italy (leading tile manufacturer): Water is an important raw material for tile manufacturing. iWAYS will enable the reuse of water which is discharged to the atmosphere. The partners expect a reduction of freshwater use by 50%.



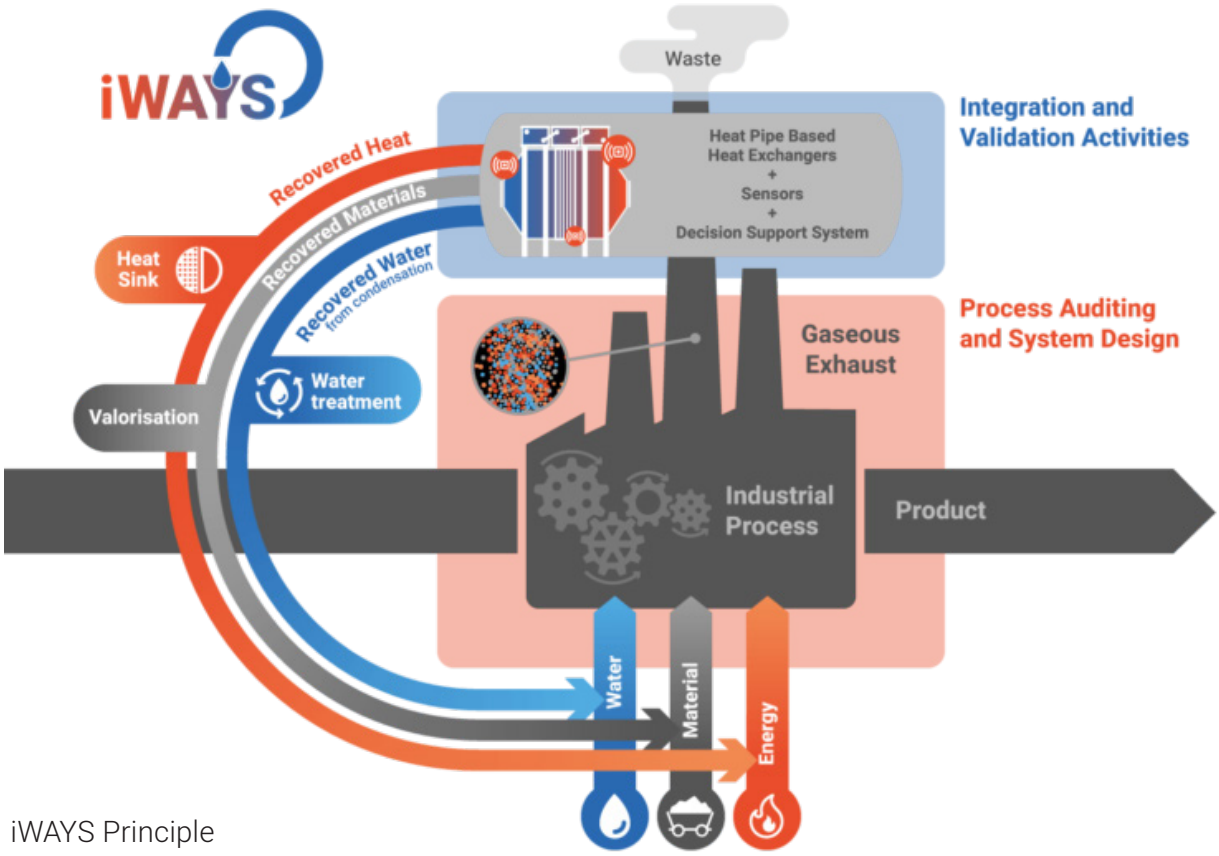
Chemical industry

Alufluor AB, Sweden (Production and supplier of aluminum fluoride): During the processes, steam is used for heating. iWAYS will improve the plants resource use and energy efficiency. It will allow to recover heat, 3,500 tonnes of water and 70 tonnes of hydrogen fluoride per year.



Steel industry

Tubacex, Spain (production of stainless-steel tubes and nickel alloys): Water is used in the cooling and degreasing processes. The solution allows to recover 30% of the evaporated water for cooling purposes, 95% of water in the sludge as well as the heat to provide thermal power.



iWAYS Principle

Innovative & Impactful Approach for a Water-Smart Industrial Emissions Directive

This project is testing solutions in line with the European Commission priorities of the European Green Deal, the Digitalisation of Europe, and its strategies such as the Fit for 55 strategy, the Zero Pollution Strategy, and the Circular Economy Action Plan. iWAYS will particularly be valuable in the context of the recast of the Industrial Emissions Directive. The European Commission released in July 2022 its legislative proposal which includes mandatory water efficiency assessment for industry.

The objective is to strongly encourage industry to value water and exploit the value in water to reduce their water footprint and pollution into air, water, and soils from industrial activities.

By working on exploiting wastewater from exhaust streams, iWAYS contributes to stress water-smart practices to support the recast of the Industrial Emissions Directive with a water-smart approach (cf. graph). The project particularly focuses on the water-waste-energy nexus.

Currently there are no significant studies, demos, or real applications, to condensate and reuse industrial streams. By using Heat Pipe Condensing Economisers with new materials and special designs capable of operating in peak conditions, iWAYS will withstand better the corrosive and high particle loaded exhaust. The main impact expected is:

- **60% less freshwater resources used**
- **Introducing water closed loop in industrial processes – recover water from the gaseous waste stream of ceramics, chemicals, and steel industries**
- **30% water and heat recovery from humid exhaust and recuperation of materials from the flue stream**
- **30% increase in resource and water efficiency**
- **Major innovation outcomes disseminated to the current and next generation of employees**
- **The environmental gains in absolute figures, and weighted against EU and global environmental footprints**
- **The planned replicability study will show that this technology can be applied to a wide range of industrial processes.**

Lastly, there is a strong digital approach in the project. It aims to adapt the technology to the different infrastructure and ensure the most efficient process to recover water, energy, and materials. Particularly it designs a scalable, replicable, and standards-based ICT platform for the control and monitoring of industrial processes. It also works on a state of the art of the most relevant data quality and sanity techniques to ensure the use of high-quality data, allowing the development of the methodology for circularity assessment and evaluation of the water-waste-energy nexus.

Conclusion

Recommendations on the Industrial Emissions Directive

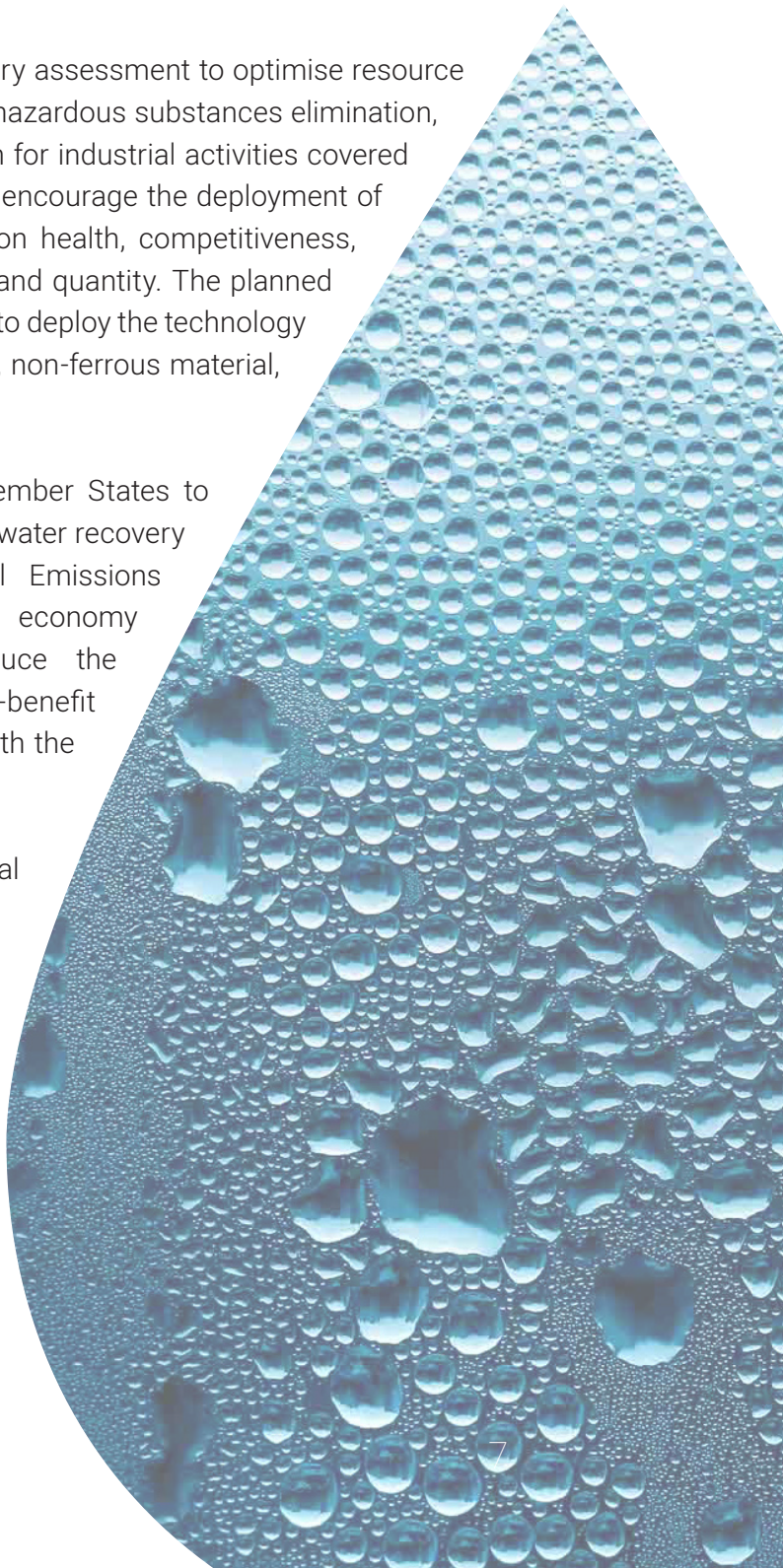
Based on the expected impact and the current research and application, iWAYS suggest some recommendations on the Industrial Emissions Directive:

iWAYS supports the inclusion of a mandatory assessment to optimise resource efficiency, including water and energy, and hazardous substances elimination, via the Environmental Management System for industrial activities covered by the Industrial Emissions Directive. It will encourage the deployment of water-smart solutions with direct impact on health, competitiveness, and environment in terms of water quality and quantity. The planned replicability study will assess the possibility to deploy the technology in other sector such as cement, aluminium, non-ferrous material, food and paper-pulp.

iWAYS encourages the MEPs and the Member States to support circular approach. It shall facilitate water recovery and reuse actions within the Industrial Emissions Directive and aligned with the circular economy principles. Circular processes will reduce the environmental footprint and increase co-benefit for the water-waste-energy nexus, in line with the Energy Efficiency Directive.

iWAYS supports the deployment of digital water to develop a circular economy model with a cross-sectoral approach around the water-waste-energy nexus. Software will support an efficient implementation of the technology which fit for each infrastructure.

iWAYS encourages the relevant stakeholders to consider iWAYS technology and outcomes in the Sevilla Process.



iWAYS

innovative water recovery solutions

Partnership

UNIMORE – Università degli Studi di Modena e Reggio Emilia

Brunel University London

AICE – jtc – Universitat Jaume I

SIMAM – Servizi Industriali Manageriali Ambientali – Gruppo acea

ESCI – European Science Communication Institute

econotherm – Waste Heat Recycling Technology

Water Europe – Technology & Innovation

incotec – Innovación Eficiente

Ceramiche Keope – a division of atlas concorde

alufluor

eurecat – Centre Tecnològic de Catalunya

Hellenic Republic – National and Kapodistrian University of Athens – Est. 1837

Lithuanian Energy Institute

ICRA – Catalan Institute for Water Research

TUBACEX GROUP

KREAN

IAMAS – Earth Friendly Technologies

Politechnika Wrocławska

Follow us

@iWAYSWaterEU

iWAYS-water-eu

www.iWAYS.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 958274