iWAYS

innovative water recovery solutions

Policy Brief

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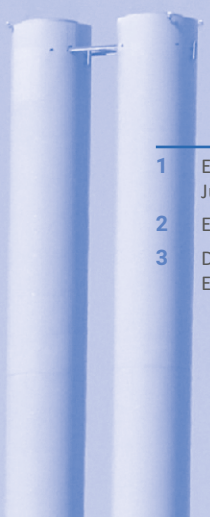
Disclaimer

Due to the confidentiality of some data, the project cannot disclose all the information that confirms the recommendations. The project consortium can be contacted via luca.montorsi@unimore.it to get further information about the project.

Executive Summary

This policy briefs includes recommendation from the EU funded project iWays– Innovative WAter recoverY Solutions through recycling of heat, materials and water across multiple sectors for the implementation of the water-efficiency first principle[1] embedded in the Water Resilience Strategy[2], as well as for the circular economy act that the European Union will issue in 2026. In addition, the project also encourages the Joint Research Centre to consider the conclusions of iWays in the process of revision of the relevant BREFs under the Industrial Emissions Directive[3] as well as to protect the provision related to water circularity in the European legislation. The project has been working on innovative solutions to recover water and heat and in some cases materials from exhaust streams. The consortium also developed digital solutions to facilitate the deployment of these solutions in other industrial sectors. The project provides solutions to build a water-smart industrial symbiosis.



1 European Commission. Implementation of the Water Efficiency First Principle: Guidance Document. Brussels: European Commission, June 4, 2025.

2 European Commission. Water Resilience Strategy. COM(2025) 280 final. Brussels: European Commission, June 4, 2025.

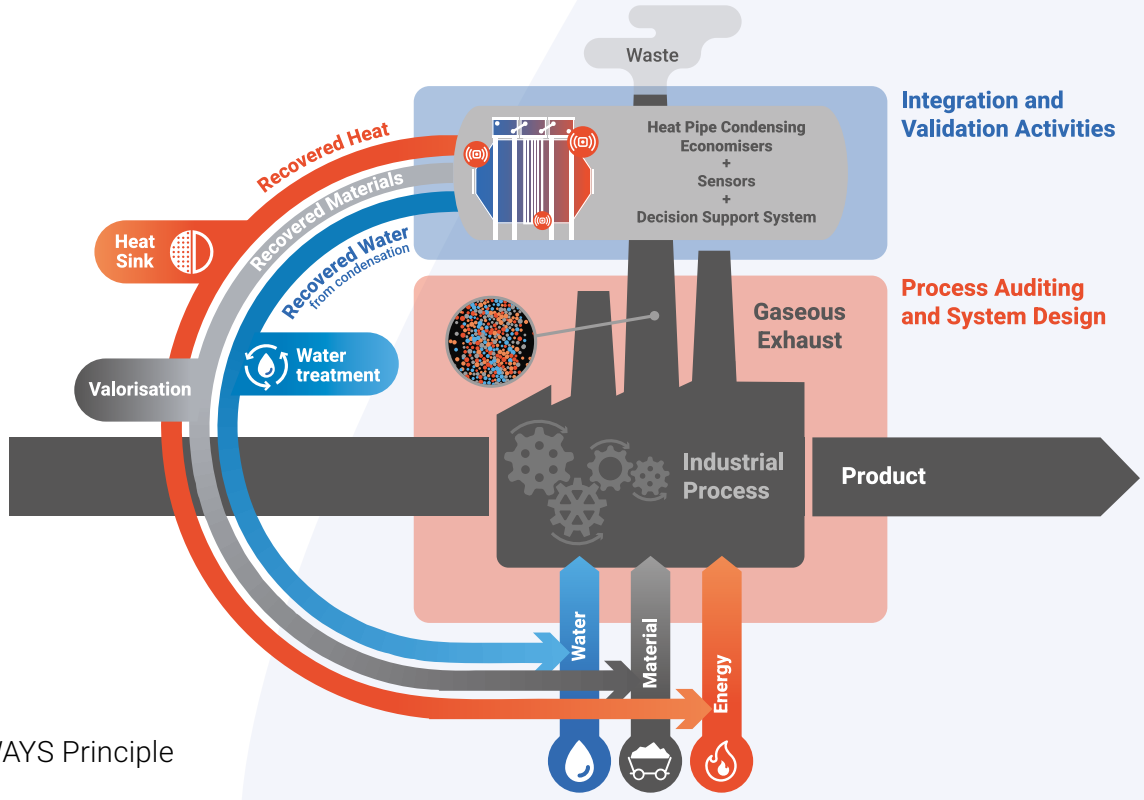
3 Directive (EU) 2024/1785 of the European Parliament and of the Council of 24 April 2024 amending Directive 2010/75/EU (Industrial Emissions Directive) and Directive 1999/31/EC (Landfill Directive): https://eur-lex.europa.eu/eli/dir/2024/1785/oj

Building a Water-Smart Industry

iWAYS – Innovative WAter recoverY Solutions through recycling of heat, materials and water across multiple sectors – is an 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** with *Ceramiche Atlas Concorde*, in Italy (leading tile manufacturer).
- **Chemical industry** with *Alufluor AB*, in Sweden (Production and supplier of aluminum fluoride).
- **Steel industry** with *Tubacex*, in Spain (production of stainless-steel tubes and nickel alloys).



iWAYS Principle

The European Water Resilience Strategy (COM(2025) 280) underscores the urgency of integrating water security, efficiency, and reuse into EU legislation and sectoral strategies. This aligns with broader EU ambitions for climate neutrality, a circular economy, and industrial competitiveness, as stressed by the Clean Industrial Deal (COM/2025/85 final). Three current EU policy action offer levers to accelerate this transition in line with iWays conclusions:

- the Circular Economy Act,
- the implementation of the Water Efficiency First principle and the new Water Resilience Strategy,
- the OMNIBUS environment announced by the European Commission

iWays has developed a batch of recommendations based on its research outcomes and its final conference[4] to encourage water-smart industrial symbiosis in Europe.

List of Recommendations

OMNIBUS Environment: Safeguarding Water Efficiency in Industrial Regulation

- Do not remove water efficiency related provision in the Industrial Emissions Directive
- Expand the scope of the Water Reuse Regulation to include industrial process and cooling water.
- Harmonised EU standards for water reuse across sector and overcome national regulation fragmentation.

Water-Efficiency First Principle: Driving Industrial Water Reuse

- Include closed-loop and cascading water systems in BAT conclusions for relevant BREFs.
- Encourage member states to require water reuse feasibility assessments in all industrial permitting processes.

Circular Economy Act: an opportunity to build business case for a water-smart industry in Europe

- Integrate water reuse targets into the Circular Economy Act for high-water-demand industries.
- Promote industrial symbiosis schemes that valorise water, heat, and material by-products across clusters.

4 iWays project Final Conference took place on the 28 July 2025, as part of the 17th International Conference on Sustainable Energy & Environmental Protection (SEEP2025)

OMNIBUS Environment: Safeguarding Water Efficiency in Industrial Regulation

Do not remove water efficiency related provision in the Industrial Emissions Directive.
iWays baseline data[5] emphasises that ceramics, chemicals, and steel production are highly water-intensive sectors. Removing water efficiency measures from the IED would weaken progress towards EU water resilience targets. The OMNIBUS should encourage other industrial sectors to look at water reuse processes[6].

Expand the scope of the Water Reuse Regulation[7] to include industrial process and cooling water.
Water reuse potential in the EU is largely untapped, with vast differences between Member States,[8] particularly for industry. In Italy, for example, only 9% of reclaimed water is used for industry, with agriculture dominating reuse[9].Treated condensate and rainwater can meet industrial water quality needs with minimal treatment and can become an alternative water source. iWays identified low total dissolved solids and low microbiological risk in rainwater and steam condensate samples[10].

Harmonised EU standards for water reuse across sector and overcome national regulation fragmentation.
Differing national and regional quality requirements create unnecessary costs and barriers for industrial reuse[11]. Standardised parameters (e.g., turbidity, pH, conductivity, heavy metals) could be integrated into EU-wide quality classes to facilitate acceptance and trade[12]. The OMNIBUS and Circular Economy Act could be beneficial to harmonise water reuse regulation and enable a single market for reclaimed water, contributing to build the business case for water reuse in industry.

5 iWays Project. D8.1: *LCA, S-LCA, and LCC Baseline for Use Cases*. Horizon 2020, 2023.

6 The replicability of the iWays solutions in other industrial sectors has been particularly emphasised during the final conference of the project.

7 Directive (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 0n minimum requirements for water reuse: https://eur-lex.europa.eu/eli/reg/2020/741/oj

8 Malinauskaite, J.; Delpech, B.; Montorsi, L.; Venturelli, M.; Gernjak, W.; Abily, M.; Stepišnik Perdih, T.; Nyktari, E.; Jouhara, H. *Wastewater Reuse in the EU and Southern European Countries: Policies, Barriers and Good Practices. Sustainability* 2024, 16, 11277. https://doi.org/10.3390/su162411277

9 Malinauskaite, J.; Delpech, B.; Montorsi, L.; Venturelli, M.; Gernjak, W.; Abily, M.; Stepišnik Perdih, T.; Nyktari, E.; Jouhara, H. *Wastewater Reuse in the EU and Southern European Countries: Policies, Barriers and Good Practices. Sustainabi*lity 2024, 16, 11277. https://doi.org/10.3390/su162411277

10 Ways Project. *D4.1: Monitoring Report on Steam and Rainwater Composition*. Horizon 2020, 2022.

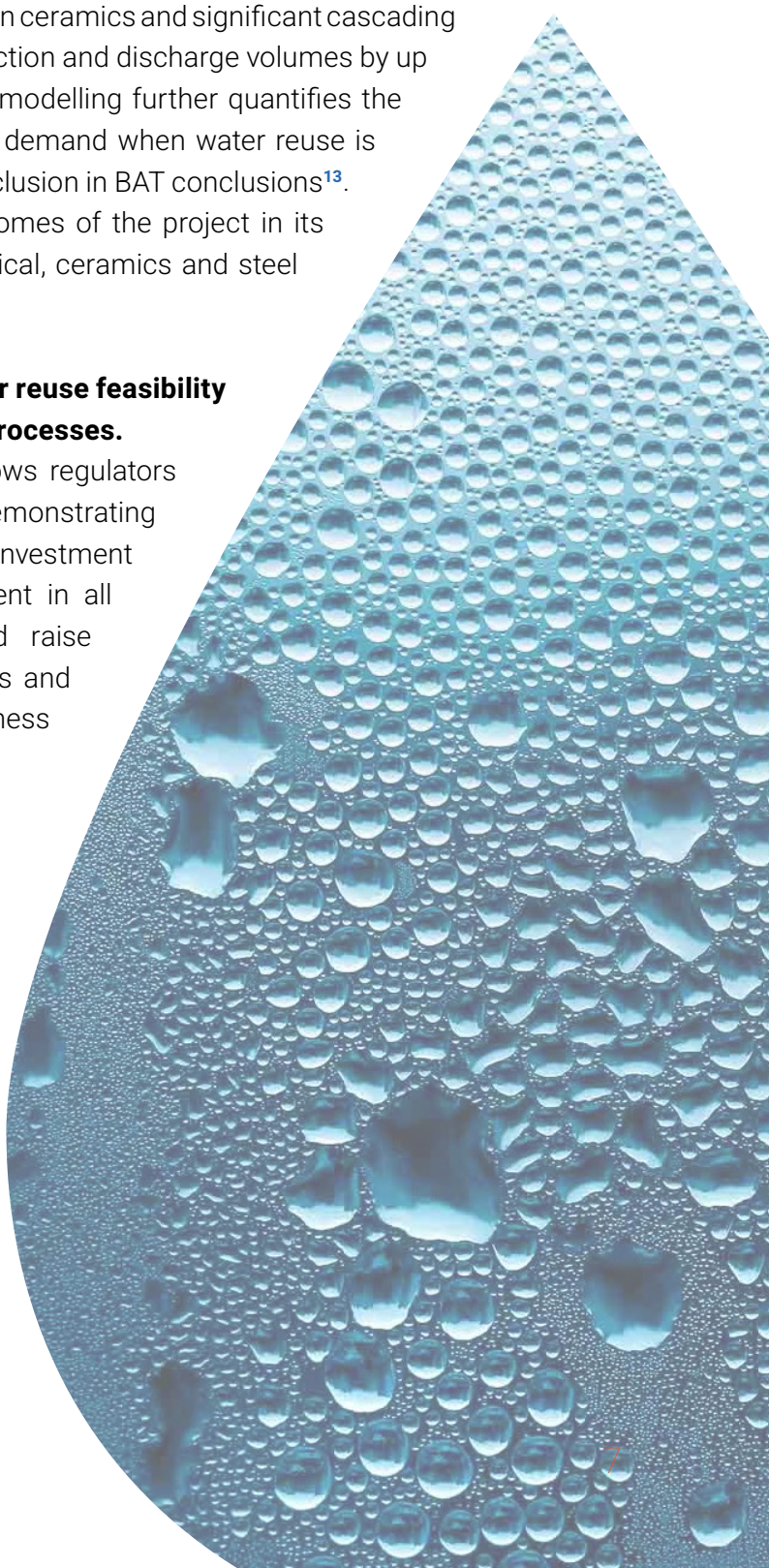
11 Vandelli, V., M. Marchetti, M. Soldati, and L. Fattore. *"Water Reuse in the EU: From Agricultural Regulation to Industrial Opportunities." Sustainability* 16, no. 11277 (2024): 1–23.

12 iWays Project. *D4.1: Monitoring Report on Steam and Rainwater Composition.*

Water-Efficiency First Principle: Driving Industrial Water Reuse

Include closed-loop and cascading water systems in Best Available Techniques (BAT) conclusions for relevant Best Available Techniques Reference Document (BREFs).
Integrating High Potential for Cross-media Effects (HPCE) technology with onsite treatment can enable closed-loop operation in ceramics and significant cascading reuse in chemicals and steel, cutting abstraction and discharge volumes by up to 40%. Moreover, the water-energy nexus modelling further quantifies the CO_2 savings from reduced heating/cooling demand when water reuse is integrated with heat recovery, supporting inclusion in BAT conclusions[13]. The BREF system could be upon the outcomes of the project in its update of the relevant BREFs for the chemical, ceramics and steel industries[14].

Encourage member states to require water reuse feasibility assessments in all industrial permitting processes.
The methodology developed by iWays allows regulators to quantify reuse potential at plant level, demonstrating viable reuse options with positive Return of Investment for industry[15]. By including this assessment in all industrial permitting processes, it could raise awareness about water reuse opportunities and provide the required element to build a business case.



13 iWays Project. D3.9: Water–Waste–Energy Nexus Modelling and Assessment. Horizon 2020, 2024. J. Malinauskaite, B. Delpech, H. Jouhara, *The water-energy-materials nexus in an industrial setting: legal and practical peripheries, Energy Nexus*, 19, 2025, ISSN 2772-4271. https://doi.org/10.1016/j.nexus.2025.100475.

14 The Industrial Emissions Directive creates several BREFs relevant for these industries such as Ferrous Metals Processing Industry & Iron and Steel Production BREFs, the Ceramic Manufacturing Industry BREF, Large Volume Inorganic Chemicals - Solid and Others Industry & Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector BREFs particularly for the demo cases of iWays.

15 iWays Project. *D6.3: Common Validation Methodology for iWAYS Technologies. Horizon 2020,* 2024.

Circular Economy Act: an opportunity to build business case for a water-smart industry in Europe

Integrate water reuse targets into the Circular Economy Act for high-water-demand industries.

iWays shows baseline water consumption per tonne of product is significant in ceramics (Atlas Concorde), chemicals (Alufluor), and steel (Tubacex), with large potential for internal reuse[16]. By combining HPCE technology with reuse loops, industry can cut abstraction and discharge volumes by up to 40% in demo cases[17].

Promote industrial symbiosis schemes that valorise water, heat, and material by-products across clusters.

iWays studies has revealed that multiple water sources are available and are suitable for cross-sector use. There is the possibility to duplicate iWays technology and reuse water as an alternative water stream within the industrial plants or for other industrial activities[18]. Analysis of rainwater and condensate shows that with minimal treatment, these sources meet many industrial quality needs[19].

16 iWays Project. *D8.1: LCA, S-LCA, and LCC Baseline for Use Cases.*

17 iWays Project. *D3.9: Water–Waste–Energy Nexus Modelling and Assessment.*

18 iWays Project. *D2.2: Water and Emissions Monitoring Campaigns.* Horizon 2020, 2022. and iWays Project. *D4.1: Monitoring Report on Steam and Rainwater Composition.*

19 iWays Project. *D4.1: Monitoring Report on Steam and Rainwater Composition.*

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Partnership

UNIMORE – Università degli Studi di Modena e Reggio Emilia

Brunel University London

AICE – jtc – Universitat Jaume I

Infrastructure – Simam

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 – Institut Català de Recerca de l'Aigua

TUBACEX GROUP

KREAN

IAMAS – Earth Friendly Technologies

Politechnika Wrocławska

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