ULTIMATE

WATER SMART INDUSTRIAL SYMBIOSIS

Policy Brief

Water-Smart Industrial Symbiosis:

a key driver for a green industry

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Contents

Disclaimer

The data provided in this policy brief remain provisional as the results of the project are still under development or due to the confidentiality of the data.

Main Recommendations

- Adopt a risk-based approach for reused water and recovered materials in Europe.
- Encourage financial incentive for circular economy systems.
- Consider the opportunities of digital tools within the revision of the directive to support water-smart industrial symbiosis.
- Familiarise citizens with circular economy systems.
- Companies may provide a more transparent overview also of their non-circular activities.

Context

Water scarcity affected 29% of the EU territory during at least one season in 2019 (EEA, 2023). Europe is currently facing risks of resource depletion and environmental degradation due to human activities.

The European Institutions aim to address these challenges through the Green Deal initiative initiated since 2019. In this context, the European Commission has opened the revision of the Industrial Emissions Directive (IED) which regulates emissions from industrial installations into air, soils, and water. The evaluation of the IED released in March 2020 highlights the need to support further a transition towards a more circular and resource efficient industry (European Commission, 2020).

Drawing on "Water Smart[1] Industrial Symbiosis" (WSIS), ULTIMATE promotes wastewater reuse in various industrial settings. WSIS can be defined as a special type of industrial symbiosis in which water and wastewater both play a key role as reusable resource, including energy and materials. ULTIMATE is an is a 4-year Horizon2020 project under the EU Water in the context of the Circular Economy programme. The project focuses in 9 demo cases on the four most important industrial sectors in Europe in terms of water use (EEA, 2018): agro-food processing, beverages, biotech industry, and chemical / petro-chemical.

ULTIMATE provides an added value by demonstrating the possibilities and benefits of reusing resources from (waste)water in an industrial context[2] thereby and reducing pressures on natural resources and future proofing European resource supply by diversification of sources and reduced import dependency. More than 25 novel technologies for water reclamation and reuse, exploitation of energy and heat, nutrient and material recovery/reuse, are testing and aim to assess the impact with life cycle and risk-based tools. It also contributes to identify legal risks for the deployment of this innovative solutions, particularly digital support tools.

> **"ULTIMATE will give examples of how water-smart industrial symbiosis will work in practice."**
>
> **Gerard van den Berg,**
> KWR, project coordinator ULTIMATE,
> 4 June 2021

1 Reference is made to the so-called Water-Smart Society defined as a society in which the value of water is recognised and realised to ensure water security, sustainability, and resilience; all available water sources are managed so that water scarcity and pollution are avoided; water and resource loops are largely closed to foster a circular economy and optimal resource efficiency; the water system is resilient against the impact of climate and demographic change; and all relevant stakeholders are engaged in guaranteeing sustainable water governance (Water Europe, 2023).

2 see Annex 5.1 and 5.2 of Deliverable D6.8

Benefits for the Industrial Activities

As stressed by CDP, the cost of inaction for industry is five time higher than the required investment to tackle water risks (CDP, 2020). Beyond this financial perspective, the WSIS is also an opportunity to:

- Relieve of pressure on resources such as water and energy.
- Safeguard sufficient water availability for all types of users.
- Increase strategic autonomy of EU industry by reducing dependence on resource importation.
- Reduce emissions into the environment.

> **"The sooner we start, the lower the cost."**
>
> Frans Timmermans, 7 October 2021, European Parliament

The benefits of the tested technologies and processes in ULTIMATE will be ultimately a pool of valuable information and technology for the technical Expert groups set up under the IED and the revision of the Reference Documents on Best Available Techniques (BREFs)such as the BREF Food, Drink and Milk Industries (BREF FDM). For instance, the consortium demonstrated in one case study that the reuse water can be done at a lower cost while complying with the regulatory requirement (Toran, 2021).

Moreover, the participation of ULTIMATE in the Water Europe Marketplace – initiated by the NextGen Project – will contribute to a better dissemination of such technology on the market. It already uploaded 9 case studies factsheets and 1 result from the case study 2 (Niew Prinsenland, NL).

Benefits of societal mobilisation

ULTIMATE also focuses on the ethical drivers and societal expectation of a water-smart industrial symbiosis. During the MEP Water Group in May 2021, the need for a broader approach on industrial activities was stressed. In line with this statement, Rapp Nilsen identified 3 drivers for facilitating WSIS (Rapp Nilsen, 2021):

1. Improve citizen awareness about Circular Economy, as they are likely to value its key concepts of reducing environmental impact (e.g. Community of practices, Water-Oriented Living Labs).
2. Support more active role of governments in the transition to a CE either by encouraging companies to adopt CE systems, providing financial incentives or legally requiring companies to adopt CE systems, for instance.
3. Minimise the risk of greenwashing, by encouraging companies to provide a more transparent overview also in relation to their circular and non-circular activities.

These conclusions echo with CDP conclusions that industry is progressively transitioning away from polluting and water intensive products due to regulatory and consumer pressures as well as responding to the new water reality (CDP, 2022). Therefore, policymakers should consider these conclusions in the recast of the IED as it remains the main legislative piece in Europe to deal with industrial activities.

Benefits for Europe's digital future

The European Union set up as a priority the digitalisation of our society particularly to transform businesses while helping to achieve a climate neutral Europe by 2050. This priority also includes industrial activities and the need to better consider the benefits of the use of digital tools for facilitating industrial symbiosis, such as the ULTIMATE QMRA Tool on the Water Europe Marketplace.

The digital tools used in ULTIMATE for the different case studies identified the benefits towards industrial water reuse aiming for zero discharge. Beyond the benefits to reach the objective of the IED in terms of emissions into water, digitalisation of the water cycles could support benefits for several water-related legislation such as the Water framework Directive as identified by a set of EU funded projects (European Commission 2022).

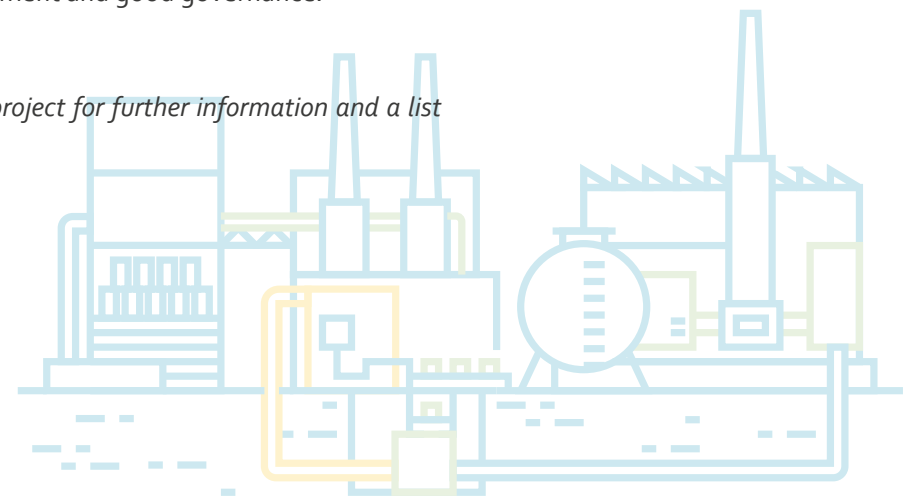
Benefits of partnership with other stakeholders

ULTIMATE has joint the CIRSEAU and ICT4Water clusters to build on synergies and exchange of experience between different EU funded projects. It also participated in more than 12 synergies workshops.

Out of these synergies, in June 2021 and 2022, ULTIMATE identified recommendations related to the IED during Water Project Europe workshops (European Commission, 2021 & Water Europe, 2021), as follows:

- More emphasis needed on the reuse of wastewater within the industrial processes and the recovery and reuse of raw materials. It supports the inclusion of water efficiency provision within the new legislation.
- A policy requirements shift from means to goals/targets would give more opportunities for innovation procurement. This perspective will contribute to adapt the implementation at the local level while unlocking potential innovative solutions, related to digitalisation for instance.
- Quantitative goals regarding circular economy should be adopted to stimulate the development and uptake of new circular technologies and processes.
- Partnership between industry and utilities looking for symbiotic gains can contribute to a better implementation of water-smart industrial symbiosis by stimulating stakeholder engagement and good governance.

See Deliverable D6.8 of the ULTIMATE project for further information and a list of references.



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