Institute for Sustainable Process Technology

ISPT Platform Water Transition

Peter de Jong, peter.dejong@ispt.eu

Agata van Oosten, agata.vanoosten@ispt.eu

Annita Westenbroek, annita.westenbroek@ispt.eu

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Concept note, December 2024

The demand for drinking water continues to rise, while climate change and pollution are putting pressure on the supply. Without drastic measures, the Netherlands will face large-scale water shortages by 2030. Industry plays a crucial role in securing the regional water supply and can also contribute to innovative solutions to prevent water stress. This transition can be significantly accelerated in collaboration with all water stakeholders. ISPT therefore wants to establish a platform that facilitates the dialogue between companies, technology suppliers, governments and knowledge institutions in order to realize the much-needed system change, which is necessary to make water savings possible in a sustainable and economical way.

Reason: Increase in demand and pressure on water availability

The need for drinking water is growing due to population growth, economic activities and the energy, materials and agrifood transition. At the same time, climate change and pollution are leading to a decrease in available water resources. This is already resulting in regional shortages, preventing water authorities from supporting new economic activities, and will become a national problem by 2030 without interventions.

The industry uses water not only as a component in products, but also in production processes and maintenance. Additional transitions to combat climate change – such as the production of hydrogen and increasing production of plant-based proteins – are expected to further increase the demand for water. As a result, the challenges in water supply are more extensive and urgent than ever.

Current measures and restrictions

The Dutch government and various institutions have taken several initiatives to improve water availability, such as:

- Drinking water from wastewater: Projects such as The Ultimate Water Factory produce drinking water from treated wastewater.
- Delta Programme on Freshwater Supply: Focuses on the conservation of regional freshwater, for example by building up larger water reserves and retaining water for longer, for example in dunes or basins.
- KWR joint industry research programme: Water Industry Research for Efficiency and Sustainability (WIRES): aims to assist the industry to identify and adopt more efficient internal water use strategies, e.g. through enhanced process efficiency, alternative processes, or wastewater recycling and reuse

Although these measures contribute to the water transition, there is a lack of an integrated approach in which all relevant stakeholders are actively involved. Research organisations often focus on specific sectors such as drinking water companies (KWR), water boards (Stowa), or agriculture (WageningenUR), without considering industry as a core integral component.

Challenges for the industry

The industry is already carrying out various projects on its own site that contribute to more sustainable water use, such as water reuse, energy saving and reduction of chemicals. Yet many challenges transcend the individual factory site. Important obstacles are:

- Discharge of concentrated (salt) streams: This entails complex permit procedures.
- High energy and emission costs: Further purification and reuse of water increase energy consumption and CO_2 emissions.
- Strict water quality requirements: Health and hygiene standards in product chains limit opportunities for reuse.

- Required investments: New process configuration and applied technologies are needed generating economic risks.

However, if regional and integrated cooperation can be achieved by all water users, processors and managers, knowledge and facilities are shared and solutions are found together for infrastructural and legal challenges by all participants in the water chains, major steps can be taken in the sustainable prevention of water stress and maximum valorisation of (the scarce resource) water.

Opportunities for regional cooperation

Regional and integrated cooperation between water users, processors and managers should reduce water stress and optimise water as a raw material. Key opportunities include:

- Cascading and symbiosis. Industrial water can be reused in a cascade, where the residual water from one process serves as input for another process or sector. However, this requires smart technologies and cooperation between companies and with water treatment plants.
- Innovations in water applications. Industry can contribute through water collection and supply depending on the processes. Think of reusing cooling water in production processes where drinking water quality is not required; use effluent from water treatment plants where drinking water quality is not required. Bringing wet, nutrient-rich residual flows and water directly onto the land instead of drying and/or purifying first. Use of RO-treated (reverse osmosis) water for boiler feeding or hydrogen production.
- Mixing and processing of water streams towards higher value. Mixing of wastewater streams from several sources may lead to lower emission costs or new applications.
- Contribute to regional water reserves. Industrial effluent and collected rainwater can, after any treatment, be used for infiltration or regional water storage in basins.
- Smart Water Hubs. These hubs can coordinate local water management, from storage to cascading. This prevents waste, improves water quality and reduces the need for transport or over-treatment.

ISPT Platform Water Transition

In order to achieve the necessary system change, ISPT proposes a platform that facilitates the dialogue between companies, governments and knowledge institutions. The platform should not only define challenges but also proactively develop and implement solutions for water savings and optimized cascaded water use. It will drive action by engaging all relevant stakeholders to ensure the successful execution of strategies that maximize energy and resource efficiency while maintaining strict environmental, health, and safety standards.

This platform focuses on:

- **Comprehensive stakeholder management,** i.e. build strong partnerships among industry, water boards, Rijkswaterstaat, drinking water companies, and public authorities; create a unified approach by aligning stakeholders with regulatory requirements and streamlining permitting processes; and connect with sector organizations (VEMW, VEWIN, Unie van Waterschappen) to enhance knowledge sharing and accelerate solution deployment.
- **Development of a joint water transition plan**, in which policy and technology come together, development of smarter water cascading and symbiosis within and between sectors, leading to fit-for-purpose solutions where water quality is matched to the application. This includes innovative cross-sectoral water solutions, such as the use of effluent from the food industry as a source of drinking water. The plan should result in minimal waste of water, raw materials and energy, and valorisation of residual flows, such as the processing of brine.
- **Removing Implementation Barriers:** i.e. Actively identify and resolve regulatory, technical, and economic obstacles to water reuse and efficiency. Develop industry-wide best practices and advocate for supportive policies to facilitate large-scale adoption. Establish financial mechanisms and incentives to encourage investment in water-saving initiatives.

- **Focus on all sustainability issues.** Water management is inextricably linked to other sustainability goals, such as energy efficiency, climate adaptation and nitrogen reduction. Reducing water use or intake often has an impact on other issues, such as:
    - Energy consumption and emissions: Water purification requires energy, while purification and transport can increase CO_2 and NOx emissions.
    - Salt concentrations: Strict guidelines limit the discharge of concentrated salt water, which requires innovative solutions.
    - Spatial effects: The storage of water (such as rainwater) requires smart integration into regional water systems.

An overarching initiative ensures synergy between industry, water treatment plants and drinking water companies. A balanced approach is needed to combine sustainable and economic benefits. This offers scalable solutions and a future-proof approach.

The Netherlands faces an enormous challenge to secure the water supply and prevent water stress. Industry plays an indispensable role in this. With the right collaboration, technological innovations and policy adjustments, water can be seen as an integral part of broader sustainability issues. The platform proposed by ISPT offers a unique opportunity to coordinate cross-sector initiatives and achieve a joint water transition.

Collaboration is key to a sustainable future where water is not only a resource, but also a shared responsibility.

Direct activities and results

Network of water stakeholders, including industrial water-intensive companies, drinking water companies, water treatment organisations, water boards and knowledge partners.

Bi-monthly plenary meetings where expertise is exchanged on current regional cases and challenges, latest developments on legislation, technology and successful applications in industry.

Joint examination of key challenges and opportunities and joint initiation of the necessary actions to solve the challenges. If relevant, joint projects can be initiated (including grant opportunities).

Conditions to join the platform

ISPT is an open innovation platform, all types of organizations are welcome to join as member. The cost to join the ISPT Platform Water Transition is 12.500 Euros per year. The initial duration of the ISPT Platform Water Transition is two years. These costs are to cover the costs for the platform activities, as described in this document.

To join any activity within ISPT, like projects or platform a ISPT membership is additionally applied. The membership of ISPT is 15.000 Euros per year for large companies and 3.000 Euros for Small Medium Enterprises (SME), regardless of the number of projects or platforms the member is part of in ISPT. Partnership in the platform will be formalized in a bilateral Letter of Participation in a Platform with ISPT and a Partner. Participation is further stipulated in the ISPT Regulation 2022-09-21. These will be sent to you at request

Join us!

ISPT.EU

The Institute for Sustainable Process Technology (ISPT)
Groen van Prinstererlaan 37
3818 JN Amersfoort
The Netherlands
t. +31 (0)33 700 97 97
info@ispt.eu