

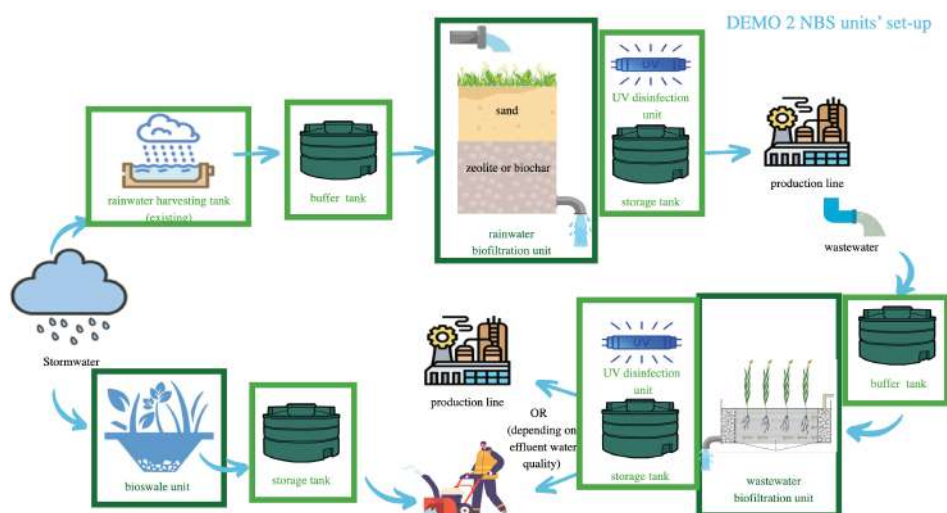
INDUSTRIAL SYMBIOSIS THROUGH SMART WATER MANAGEMENT



The DEMO 2

DEMO 2 introduces Nature-based Solutions (NbS) system that integrates several innovative components and supporting units to improve industrial water management. The system focuses on the recovery, treatment, and reuse of diverse water sources—including rainwater, peri-urban runoff, and industrial wastewater—to meet the industry's various operational needs, such as cooling and cleaning.

The system operates through three distinct yet complementary processes, each tailored to a specific water stream. A central innovation lies in the use of three dedicated NbS units, each designed to treat a different type of water.



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NbS 2.1

The first NbS is a Hybrid Xeriscape Bioswale System, designed to demonstrate how circularity can be enhanced in urban-industrial settings. Strategically located at the main entrance of the Halcor industrial facility, it captures and manages peri-urban runoff and stormwater. The harvested water is reused to irrigate a fully renovated small garden with native aromatic herbs and drought-tolerant ornamental plants, integrating nature into the industrial environment.

NbS 2.2

The second NbS consists of a biofiltration column for rainwater treatment. This unit is connected to an existing underground rainwater harvesting tank and significantly improves stormwater quality. The column contains a multi-layered filtration medium, such as sand, zeolite, and gravel, which is topped with vegetation. This vegetated layer promotes the development of a biofilm, which plays a key role in enhancing pollutant removal through improved adsorption processes.

NbS 2.3

The third NbS is a subsurface flow constructed wetland, functioning as a biofiltration system to treat the industry's production wastewater. This unit is specifically designed to purify the effluent, making it suitable for reuse within industrial processes.



*Please note: This is a photorealistic rendering. The final design of the bioswale may differ from what is shown.

Identified Nature-based Solutions



The identified Nature-based Solutions are those mentioned above, specifically:

- Biofiltration column for rainwater
- Bioswale (pilot)
- Biofiltration column for industrial wastewater

Co-benefits

This initiative promotes a significant increase in the valorisation and reuse of non-conventional water sources, including rainwater and treated wastewater. It emphasizes the adoption of sustainable and innovative treatment practices that not only improve water quality but also support long-term resource efficiency. As a result, the overall water and energy footprints of the systems involved are expected to decrease substantially, contributing to more resilient and environmentally responsible industrial and urban water management strategies.

Sustainable Development Goals



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