Baltic Smart Water Hub – portal for water experts

- Good practices
- Technical solutions
- Tools
- Innovations
- Expertise exchange

WATER AREAS: FRESH, STORM, SEA AND WASTE WATER

The online portal, developed in the BSR WATER platform, offers opportunities for sharing the achievements, exchanging on the effective management models, promoting local excellence – all around the topic of the smart water sector.

Apart from the examples of smart operation, the Hub has an international team of dedicated experts, available information on relevant policies as well as funding opportunities, and a captivating Water Blog. Explore and engage!

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Piloting phosphorus recovery by RAVITA process, Finland

Innovation

WASTE WATER

As the EU moves toward circular economy, recovering materials from waste streams becomes increasingly important. RAVITA is an innovative recovery method used to produce phosphoric acid directly from wastewater, namely, from the chemical precipitation sludge.

This process is tested in a pilot (1 000 PE) built in Viikinmäki WWTP in Helsinki. It is a very promising solution as the method is not dependent on the WWTP size and offers excellent scalability. First pilot's results show that over 80% of phosphorus is recoverable.

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Sludge recycling by hydrothermal carbonization with TerraNova® Ultra technology, Germany

Innovation

WASTE WATER

The innovative path for wastewater treatment plants: reduce the amount of sludge, lower the energy consumption, reduce the load of hazardous substances as well as causes of eutrophication, and aim at P-recovery!

The climate-friendly TerraNova® Ultra technology allows extracting nutrients, namely phosphorus and nitrogen. At the same time the technology enables producing green energy in the form of a charcoal-like fuel and boosting the biogas production from sewage sludge in WWTPs.

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Aquacare BioPhree® – Capturing phosphate through absorption

Innovation

WASTE WATER

As phosporus is both a limited resource and one of the main causes for eutrophication, getting phosphorus out of both wastewater and runoff streams is of vital importance. Aquacare's BioPhree® demonstrates a strong innovative potential for phosphorus reuse and recycling also in the Baltic Sea Region.

The technology is based on a series of absorption vessels, which capture P until saturation is reached. One of the main benefits of the system is that the absorption materials can be regenerated - phosphorus is desorbed into a cleaning solution, from where it can be extracted. The whole system is based on circularity.

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Production of artificially infiltrated groundwater in Turku, Finland

Good practice

FRESH WATER

With the increasing effects and risks of the climate change, ensuring safe and sustainable water production becomes crucial even in the Baltic Sea Region.

The Turku water company supplies the region with the artificially produced recharged groundwater, which is purified by natural methods. This environmentally friendly and cost-effective purification process is similar to the formation of natural groundwater, but it is controlled and optimized, as it is based on the latest and best available technology.

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Full-scale deammonification system for reject-water treatment at Tartu WWTP, Estonia

Technical Solution

WASTE WATER

Tartu Waterworks Company (100 000 PE) is one of the many plants in the Baltic Sea Region applying the anaerobic digestion of sludge. Nitrogen-rich reject-water produced in anaerobic digestion is commonly recirculated back to the process, increasing the nitrogen load and challenging the main treatment process in keeping the discharge limits.

As part of the IWAMA project, to enhance the nitrogen removal with a cost-efficient investment, a full-scale deammonification system was implemented for reject-water treatment, using existing infrastructure.

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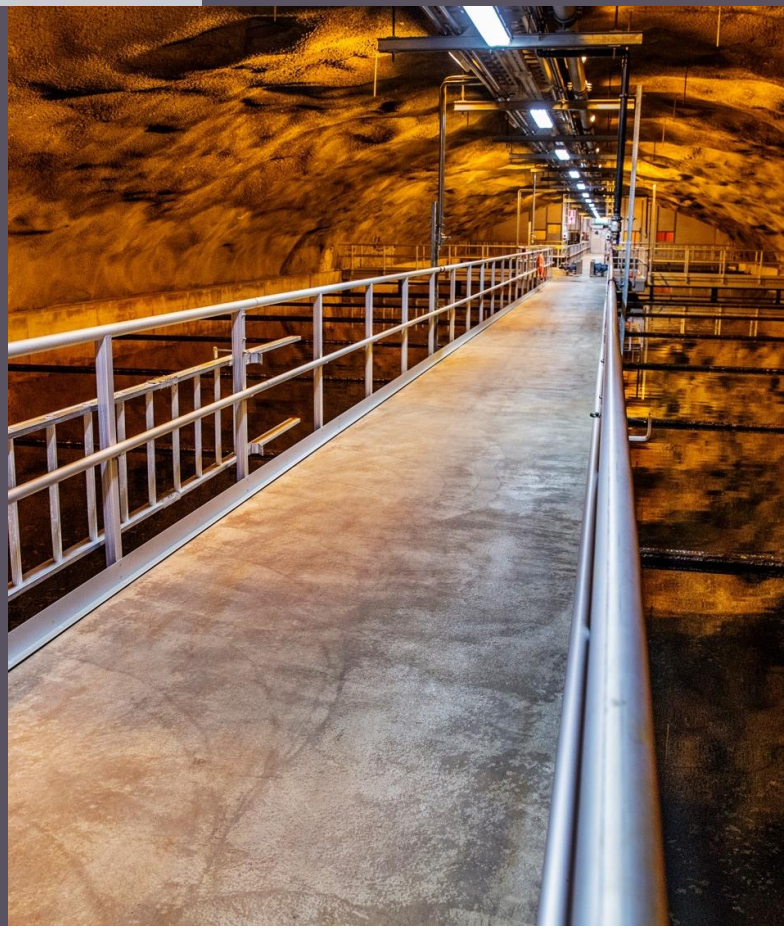
Energy optimization of active sludge process at Kakolanmäki WWTP in Turku, Finland

Good practice

WASTE WATER



Aeration process may take up to 50% of the total energy consumption at the wastewater treatment plant. Therefore, optimizing the control mode of aeration and compressors can result in remarkable savings.

Kakolanmäki WWTP (325 000 PE) monitored its aeration process, and after the test period equipped all biological treatment lines with ion-selective electrodes. This helped to increase the efficiency of the nitrogen purification, as well as allowed more resilient process in addition to energy savings.

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Replacement of pumps for recirculation and sludge pre-heat in Szczecin, Poland

Technical Solution
WASTE WATER

Different smaller adjustments, like inefficient pumps, can help to optimise the performance of the wastewater treatment plant. At Pomorzany WWTP, the inlet of older pumps had been clogging repeatedly, leading to the ever-increasing need for cleaning, binding staff resources and increasing the risk of failure.

Replacing the old pumps with the new ones, with the pre-installed system of cutting all hard-to-pump solids, like fibrous materials, resulted in the reduced clogging and increased the safety of the system.

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Membrane wastewater treatment at the small WWTP in Saint Petersburg district, Russia

Good practice

WASTE WATER

The new wastewater treatment plant in Molodezhnoye settlement (11 000 PE) was constructed in the resort area of St. Petersburg on the Baltic Sea. The area hosts sanatoriums and youth health camps, making the WWTP face the unstable hydraulic and pollutants load.

The new plant applies the membrane ultrafiltration technology allowing high-quality treatment with efficient phosphorus and nitrogen removal to improve the environmental state of the district.

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Cooperation with industrial stakeholders in Grevesmühlen, Germany

Good practice

WASTE WATER

Indirect discharges can often pose a risk of disturbances of wastewater treatment processes. Instead of just defining criteria for acceptable composition of the wastewater, Grevesmühlen WWTP (65 000 PE) approached indirect dischargers in a cooperative way.

The plant offers a service to the local industries, from which both the indirect discharger and the WWTP operator can profit. This allows improved monitoring paired with the pre-treatment including optional maintenance as a service.

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System for sorption removal of toxic substances from water in Saint Petersburg, Russia

Technical Solution
FRESH WATER

In water production, it is crucial to ensure safe water supply and remove toxic and odorant substances in the treatment process.

The "Vodokanal of St. Petersburg" enterprise launched an automated system for sorption removal of toxic substances from water using a system of powdered activated carbon dosing. PAC is only applied when the water quality at the source decreases. This system ensures the removal of substances accounting for the water odour, oil products, or toxic substances penetrating at the water source.

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Beach wrack treatment in reed beds, Pomerania Region, Poland

Good practice

SEA WATER

Reed bed systems have been used for many years for treating different kinds of sewage sludge from wastewater treatment plants. They can also be applied for beach wrack.

The research on this was performed as a part of the CONTRA project. It demonstrated that the use of reed bed systems for beach wrack processing is an environmentally friendly and cheap solution with low emissions and low energy consumption. Applying this system could even create an additional income from selling the fertilizer it produces.

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Rūjiena Culture House – Dry River and Rain Gardens, Latvia

Good practice

STORM WATER

The renovation of the Rūjiena Culture House square was implemented based on the sustainable management principles. The square design incorporates sustainable strategies for stormwater in the form of a landscaped canal, rain gardens and bioswales.

The sustainable approach increases the resilience of this area and buildings to rainwater flows. The attractive, culturally meaningful and functional public space mimics the patterns and colours of a traditional dress in its paths and greenery.

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Natural treatment of storm water on a large-scale in Lahti, Finland

Good practice

STORM WATER

A stormwater treatment system was implemented in Lahti to prevent the pollution of the Lake Vesijärvi with nutrients, microplastics and heavy metal loads from the untreated discharge.

Part of the stormwater from Lahti downtown is directed to the developing city district for treatment using biofiltration and wetland. The city's stormwater load into the lake is thus reduced by 10-15% and materials are retained effectively. The system will serve as a recreational area for the future residents.

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Automated Information System “Osadki” in Saint Petersburg, Russia

Good practice

STORM WATER

The stormwater monitoring, managing and forecasting system was launched in St. Petersburg as a part of the RAINMAN project to prepare water disposal systems for increased precipitation, optimise energy consumption and save resources.

The automated real-time system helps preventing the floods in the city areas by measuring, assessing and predicting possible flood risks. The system therefore helps to enhance the state of the environment and the quality of the water bodies.

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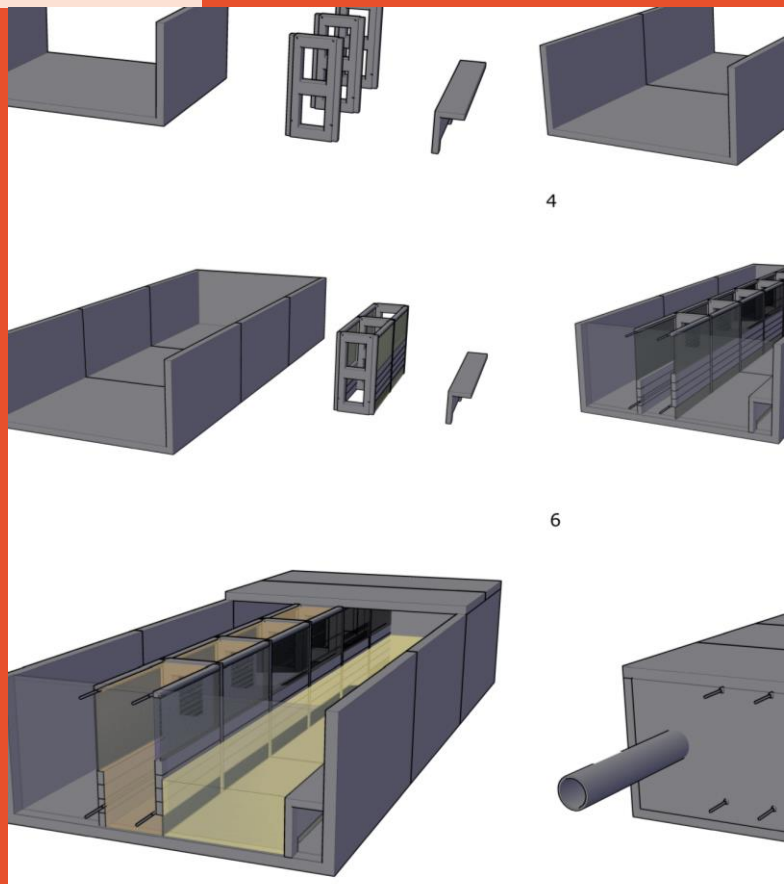
Storm water filtration unit in Helsinki, Finland

Technical Solution
STORM WATER

It is often challenging to fit new stormwater infrastructure into the densely built city areas. To meet the challenge of the lack of space, Helsinki is testing a nature-based solution with the filtration unit located underground.

The filtration unit reduces the concentrations of solid substances, litter and different harmful substances such as microplastics, and ensures treatment of the urban stormwater before it being discharged to the sea. The filter can be used on different sites of the urban environment, including integration with waterfront structures, like marine piers.



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Bioswale in a parking lot in Riga, Latvia

Technical Solution

STORM WATER

In the new urban area developed next to the shopping centre in Riga, the sustainable stormwater system was used as an attractive and functional solution for the stormwater runoff.

The parking lot of the shopping centre includes a bioswale offering multiple benefits: stormwater runoff attenuation before discharge into the sewer network, natural treatment, landscaping function, space for snow storage during winter.

The runoff from the bioswale barely reaches the city sewer system, providing almost completely decentralized stormwater management.

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Interactive Simulation Game on Maritime Spatial Planning, Saint-Petersburg, Russia

Tool

SEA WATER

Managing marine resources and maritime spatial planning entails a complex system of governance that involves a variety of stakeholders on both national and transnational level.

The Maritime Spatial Planning Game aims at raising awareness and achieving wider public and stakeholder engagement in the interactive and engaging way. The game simulates the real maritime spatial planning process, integrating key issues of the sea management and forcing players to take into account all aspects and complex factors of the marine use.

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Stakeholder cooperation through Water Users Partnership, Kaliningrad Region, Russia

Good practice

ALL WATER AREAS

Insufficient cooperation and connection in the matters of the shared use of water resources can lead to inefficient water management. Developed in the WaterNets-RU project, the Water Users Partnership concept is a new method of implementing measures through the cooperation between local and regional stakeholders.

WUP helps to raise awareness of the local environmental conditions, gathers knowledge and expertise, and can result in concrete actions including investments.

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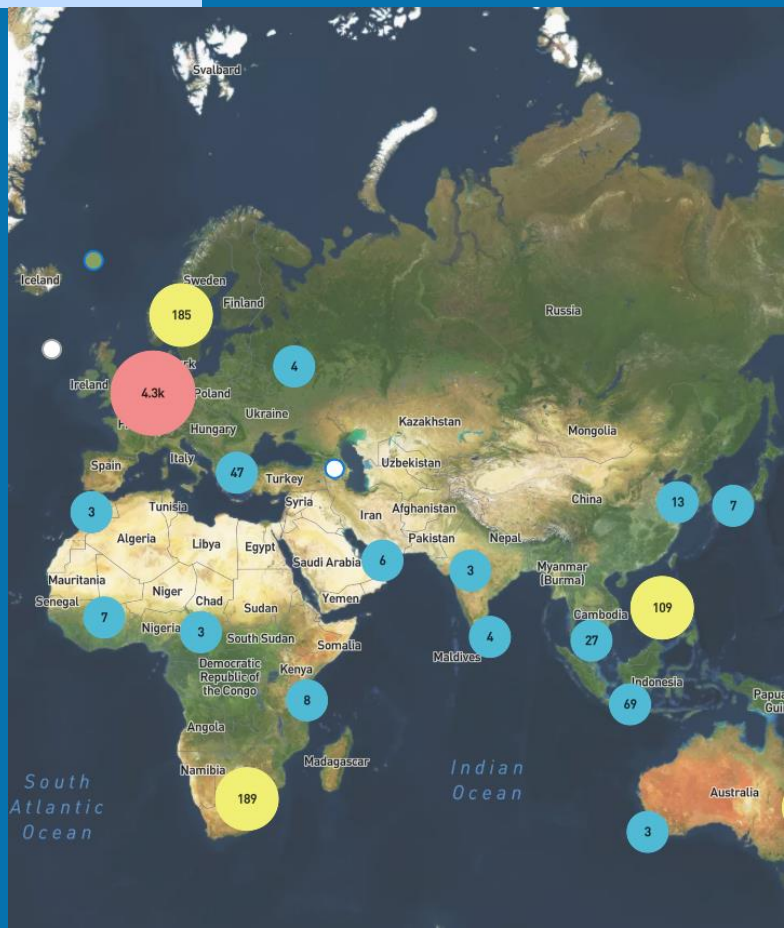
Online knowledge-sharing platform ClimateScan

Tool

ALL WATER AREAS

Displaying solutions from all around the world, the online ClimateScan platform contributes to the climate adaptation by promoting more green and blue spaces in urban areas. It introduces the variety of ways to implement nature-based solutions based on the local conditions.

Implementing small-scale nature-based solutions requires involvement and enthusiasm of a multitude of stakeholders. Engage them through the citizen science platforms like ClimateScan!



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