

REDUCING MICRO-PLASTICS IN THE NSR AQUATIC ENVIRONMENT

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About Sweco



- Transport and infrastructure
- Architecture and structural engineering
- Energy and industry
- Water and environment

Together with our customers, we plan and design the cities and societies of the future

- #1 engineering consultancy on European market
- Strong local presence
- 14,500 employees
- Net sales EUR 1,7 billion



The problem of microplastics in water

- Secondary microplastics result from breakdown of larger objects/plastic litter, which due to poor waste management end up in environment
- Primary microplastics are granules, pellets and fibres directly entering the marine environment in a large polymeric diversity in surface waters
 - Artificial grass and athletic tracks emit small plastic bits with rainwater run-off
 - Clothes etc. leaching microplastics when washed and accumulate in dust
 - Pharmaceutical and personal care products
- Pervasiveness of plastic pollution in European waters is demonstrated
 - Ingestion of microplastics by fish(-larvae), crabs and sea-plants
 - Concentration into the food chain (predators and humans)
 - Negative effects at both, individual and sub-organismal levels start to appear: reduced reproduction, impact on metabolism, organismal health

Microplastics are of a particular concern, since there are no easy ways to remove them from the marine environment due to their small size, chemical inertness, vast distribution and similar dimension as for example plankton and fish eggs.

megaplastic > 100 mm
 macroplastic > 20 mm
 mesoplastic 5–20 mm
 microplastics < 5 mm
 nanoplastics < 100 nm

Marine Strategy Framework Directive (2008/56/EC): achieve 'good environmental status' of all EU marine waters by 2020 by reducing the impact of marine litter on the coastal and marine environment. One of the qualitative descriptors is that 'properties and quantities of marine litter do not cause harm to the coastal and marine environment'.

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Building upon other projects

- Interreg Central Baltic - BLASTIC aims at reducing plastic waste by mapping sources, flows and pathways of litter in the aquatic environment
- Interreg Baltic Sea Region – MareLitt identifying good practices for the removal of litter and derelict fishing gear from Europe's 4 regional seas
- Interreg 2 seas - Via modeling of the area, the MICRO partners will assess the potential hotspots for any accumulation of microplastics
- Horizon 2020 - Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans)
- Microplastic food web accumulation project 'PlasticCod' funded by Norwegian Research Council



All these projects look at the sources and pathways of microplastics and the effects on nature and men, but no project looks into reducing the microplastics which are in our aquatic ecosystems

The idea

Integration of microplastic removal technologies at large scale surface water abstractions

- Use existing locations where surface water is actively collected
- Integrate technologies without impact on primary function of the abstraction
- Find means to further process the microplastics removed from the surface water

Who, where and how to remove microplastics from our aquatic environment

- Focus on large surface water abstractions in the North Sea Region
- Remove microplastics at water intakes and water treatment facilities
- National and EU industrial branch organisations in the NSR countries are to be involved as partners for following sectors:
 - 1) Waste water treatment and drinking water plants
 - 2) Energy production cooling water intakes and hydropower dams
 - 3) Waste incineration (WtE) plants cooling water intakes
 - 4) (petro)chemical industries cooling water intakes for
 - 5) Surface water installations as weirs, sluice and pumping engines
- Sources of plastics: organisations to be involved as supporters:
 - a) Plastic material production industry organisation
 - b) Cosmetic organisations
 - c) Chemical industry organisations
- National and regional water and environmental authorities as promoters

Microplastics project concept

Eco-innovation required to preserve the aquatic environment

Environmental stewardship

Together the partners and supporters will:

- Analyse the scale and characteristic of microplastic contamination of the intake water
- Analyse how the partners and supporters can be part of the solution
- Assessment of suitable technologies to remove microplastics at their plants
- Study the feasibility of promising technologies at the largest scale possible
- Execute socio-environmental cost benefits analyses
- Stimulate the adoption of new microplastics removal technologies by target groups
- Cooperation with peers to find ways to reduce microplastic in our aquatic environment
- Dissemination of knowledge and insights to increase awareness of the public and industry to increase environmental stewardship (source approach)

Integration of microplastic removal technologies at large scale surface water abstractions



Transnational cooperation is essential

- European Marine Strategy Framework Directive highlighted environmental implications of marine litter and underlined urgent need for member countries to “Determine trends in amount, distribution and composition of micro-particles (mainly microplastics) in European waters and establish baseline quantities, properties and potential impacts”
- Broad cooperation required to achieve significant impact on European scale (river basin; transitional waters; cross-border; coastal waters; the North Sea)
- Include it as environmental stewardship within the North Sea Region first
- Eco-innovation of suitable removal technologies accelerated by technology development and demand on North Sea Region scale



Dear workshop participant:

In what way is your organisation interested or involved in microplastics?

- Who has heard about it?
- Who made plans or is planning for it?
- Who is planning to invest?
- Who has a facility abstraction substantial volumes of surface water water?

Questions about the new application?

Feedback on our project idea on Microplastics

- Was it interesting?
- Did you learn new things?
- Will you consider it in your work?
- Do you want to join our application? – send email to Geert.Schaap@Sweco.se
- Thank you!

- Worldwide Coastal Clean-up Day: Saturday 16 September 2017



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