Ultrasound tackles "invisible" nano-plastics

COVID pandemic fast-tracks technological development that will clean plastic litter in oceans.

The current COVID pandemic challenges our societies with extensive amounts of plastic mask debris released into our environment. As a response to this growing issue, and to respond to the nanoparticle pollution in the water ecosystems, several technological solutions are being accelerated to achieve the overall goal – a cleaner, safer and healthier environment for everyone. InNoPlastic, a newly launched EU H2020 research and innovation project, combines ultra-sound methodologies with other innovative solutions, to tackle plastic litter and enable easier removal from oceans and the seas worldwide.

The project will work on three different technologies each targeting multiple types of marine plastic pollution that occur in various environmental settings.

The first solution targets micro and nano plastic that affect the marine environment and ultimately our food chains. In an exciting combination of ultra-sound, flocculants, and a drum screen we aim to funnel water from massive industrial cooling water systems to agglomerate and filter out the harmful micro and nano-plastics out of our waters. The objective is to bring it to fulfilment whilst protecting local marine life. The amount of cooling water extracted and returned in the industry is equivalent to half of what the river Rhine discharges.

The second clean up technology is the autonomous litter hunting robot “SEEKer” that will patrol beaches together with human help or alone in hard-to-reach locations. SEEKer will use machine learning intelligence to identify, monitor and, of course, also pick the plastic litter as it goes along.

The third solution is the Empower social app, which incentivizes and rewards local volunteers and tourists to pick and track litter in community clean-ups, for example, by offering a discount on your favourite pizza, fitness gym or gifts for others. The app collects information that will, consequently, provide essential knowledge about the types of pollution, its location, condition and how the collected litter can be put to good use in the circular plastics economy.

The cleaning technologies will be test-driven in varying environments, from industrial sites in the Netherlands to tourist beaches and natural sites in Krk (Croatia), Venice (Italy), Sint Maarten (part of the Kingdom of the Netherlands), and the Thames estuary in the United Kingdom. By the end of the project, we plan to be able to remove 90% of all litter from these sites, creating a long-term positive impact on the local ecosystem and wildlife. Ultimately, the collected plastic will be recycled back into new products creating value out of the waste and supporting the circular economy.

Gregor Luthe (Professor and inventor, NanoBay): *“Thanks to COVID-19 we have been able to accelerate the development of our solution, which is now commercially available. We look forward to investigate its possible advantages in water and freeing our oceans and waterways from nano-plastics.”*

Wim van der Stricht (CTO – carbon circularity, ArcelorMittal): *“The collected plastics can be recycled through our steel manufacturing process. This fits nicely in our carbon circularity strategy where plastics will replace our fossil fuels and produce a syngas suitable for the chemical industry to produce new plastics.”*

Cornelis van Houwelingen (head regulatory, DOW): *“We know that we can’t solve the plastic waste issue alone. We are all partners in this cause to end plastic waste in the environment. At Dow, we can contribute to this project in two ways. Firstly, our cooling water systems can potentially act as filters to*

take out the micro-plastics coming from the river Scheldt. And with the collected plastics we will identify within the project what viable recycling routes are possible, fitting seamlessly in our sustainability strategy and in advancing a circular economy."

The Hollywood star **Liev Schreiber**, involved with Venice Lagoon Plastic Free team and with a team of French reporters from *Feelingside production* on a marine litter monitoring in the Grand Canal of Venice, told us that "*by being passionately fond of the sea, he is also active with his family in environmental and clean-up activities in Montauk (Long Island)*." By sharing the same bond with nature, we all found the experience very enjoyable and rewarding.

Davide Poletto, Director of Venice Lagoon Plastic Free, during the interview with Euronews, stressed out the importance to engage people on the field to fight against marine litter: "*I think that one of the most important things is to get people closer to the problem of marine litter, of how we treat our environment, rebuilding a bond that's been somehow cut off in our modern civilisation between us and our environment. This is the key to make bigger changes — much bigger than cleaning up a little piece of the lagoon.*"

Susie Jahren (Sintef): "*We are thrilled to be part of developing solutions that keep plastics out of the environment, ensure they are put back into the loop and support the transition to a circular economy.*"

InNoPlastic invites interested stakeholders and communities to take part in actions to clean coastal ecosystems from plastic pollution. Only through the joint effort, we can activate a wave of change and progress with a solution for the global problem of marine plastic litter.

The project consortium consists of 17 partners from 10 different countries includes 2 research organisations, 2 Government bodies, 4 Industry End Users, 2 NGO, 7 SME of which 4 technology and 3 service providers.

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FACT BOX

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