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MAELSTROM

MArinE Litter SusTainable RemOval and Management

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Remove. Recycle. Give it a new use. Repeat.

EU H2020 MAELSTROM kicks off to tackle marine litter in coastal ecosystems

three days to present goals and activities that will be carried out in the coming years. With one common goal: to protect coastal ecosystems by removing, recycling, and putting marine litter back in the market chain.

Finally, it's here! The MAELSTROM project funded under the European Union <u>Horizon 2020</u> <u>Programme</u> and dedicated to the **mitigation of marine litter impact in coastal ecosystems**, has officially started. The kick-off meeting was held online in three morning sessions from February 3 to 5, 2021. A detailed plan of the activities to be implemented was discussed and each partner had the opportunity to present its own deliverables, overall role, and contribution to the project. Focus was given to partners' interaction with the different work packages and to alternative strategies that might be necessary to be implemented in order to mitigate the COVID-19 impacts on the project.

What is MAELSTROM?

MAELSTROM is a four-year project (scheduled to end in December 2024) led by the <u>Institute</u> <u>of Marine Sciences</u> of the Italian National Research Council (CNR-ISMAR) - the largest scientific institution in the country.

MAELSTROM's main goal is to find strategies to reduce the impacts of marine litter in costal ecosystems, **by identifying accumulation hotspots and by removing the existing litter** from the coastal seabed and the water column of rivers **before it reaches the sea**. This is particularly important as marine litter poses a serious threat to both aquatic life and to ourselves, and parts of it can enter the **food chain and get into the food we consume**. The project aims to implement innovative and environmentally sustainable technologies to remove and recycle the marine litter. With the new removal technologies, the project will clean large coastal areas near Venice (IT) and Porto (PT). Careful environmental assessment will also be done before and after the cleaning to evaluate the sustainability of the removal technologies.

The removal technologies include two automated systems: barrier of air bubbles and a large robotic platform. The <u>barrier of air bubbles</u> is generated by a system laid on the riverbed or installed in strategic positions in the lagoons and port areas. It will allow the recovery of waste while contributing to the reoxygenation of the water. The large robotic platform will automatically remove solid waste located on the seabed and in the lower layers of the water column with high efficiency.





What will we do with the removed waste?

With a vision to promote a **circular economy**, MAELSTROM will not only remove marine litter, but it will also recycle it by combining innovative processes and technologies using physical-chemical treatment approaches. In this way, **the waste will become a new resource**: chemical precursors, polymers, and materials that can re-enter the industrial supply chain.

Recycling operations will also be associated with the introduction of waste into a waste-toenergy prototype, which is capable of producing energy and second-generation fuel. In turn, the fuel will be used to power the technologies dedicated to the cleaning of the seabed within the project itself. A cycle that runs itself continuously!

MAELSTROM's design draws from the <u>Marine Strategy Framework Directive</u> of the European Union, which aims to protect the seas and oceans, and is in accordance with the <u>Circular</u> <u>Economy Action Plan</u>. The project will also contribute to <u>Goal 14</u> of the UN Agenda for Sustainable Development: "*Conserve and sustainably use the oceans, seas and marine resources for sustainable development*".

Three days together to assess critical issues and thinking about solutions

As much as everyone hopes that the limitations posed by the COVID-19 pandemic can end as soon as possible, it is necessary to consider the current situation and prepare to overcome the challenges it poses. Thus, the second day of the meeting was dedicated to discussing the challenges that MAELSTROM may face. Each partner has conducted an analysis of its own work plan and identified potentially critical aspects for its implementation and management, proposing alternative solutions to be put in place whenever necessary to ensure everyone's safety during the project.

This moment of discussion was also important to strengthen the interaction between different partners, where solutions can be found together by exchanging ideas from the experts from different backgrounds. In fact, the strong collaboration between the partners is the fundamental principle of MAELSTROM, which is not to be a mere project on itself but aims to become a platform for **collaboration** and for **the exchange of best practices and tools** among partners and other projects. The mutual goal is one and very important: conserve and restore the marine environment as quickly as possible.

Finally, the "Problem Solving Day", the third and last day of the meeting was dedicated to understanding how to deal with any critical issues, as well as addressing some administrative aspects of the first year of work.





Working together to protect the Planet

To tackle the long-standing problem of marine litter is the main goal of the MAELSTROM project. In this sense, the collaboration and the ability to bring together disciplines from robotics to marine biology, and citizen behavioural change, are key. The project will address the marine litter problem in a comprehensive way: not only by monitoring its presence and removing it but by also connecting and disseminating good practices that will mitigate its accumulation and impacts in the coastal ecosystem. Last, but not the least, the project will test and implement innovative technologies to recycle and give all the marine litter a new use by re-introducing it in the market chain.

A first step towards climate neutrality by 2050 and decoupling economic growth from resource use, as foreseen by the European Green Deal.

"We know that many human activities pose a threat to the marine ecosystems, so it is our responsibility to find solutions to address this issue" says Fantina Madricardo, researcher at ISMAR-CNR and project scientific coordinator. "In many cases, scientific and technological advances offer an important help in protecting the environment. However, they are not enough: the real basis for achieving concrete results are the commitment and collaboration of all. For this reason, MAELSTROM will be strongly dedicated to public engagement and collaborative networking between projects and actions focused on reducing marine litter and its devastating impacts on coastal ecosystems."

Contact details

Fantina Madricardo **Project Coordinator CNR-ISMAR**

Isabel Gomes

Communication Manager CIMA Research Foundation

fantina.madricardo@ve.ismar.cnr.it communication@cimafoundation.org

Anna Romano

Scientific Writer **CIMA Research Foundation**

communication@cimafoundation.org

Please feel free to contact us on communication@cimafoundation.org

