

New solutions for the removal and recycling of marine litter: From MarGnet to the H2020 - MAELSTROM project

Fantina Madricardo

CNR-ISMAR

blue**med**

Research and Innovation
for blue jobs and growth
in the Mediterranean Area



5 PARTNER

EU contribution granted -
488,575 € (80%)

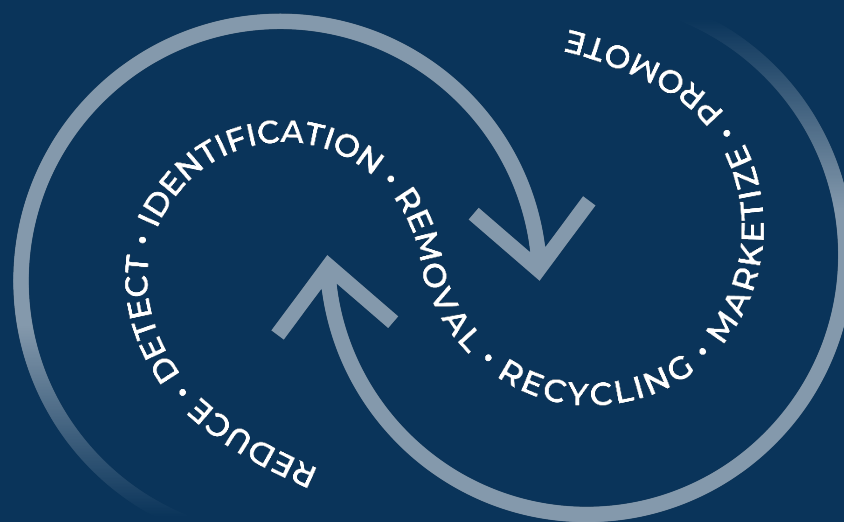
Duration 24 months

Jan 2018-Dec 2020

www.margnet.eu



Co-funded by the European
Maritime and Fisheries Fund



MAELSTROM

MARinE Litter SusTainable RemOval and Management

14 PARTNER

EU contribution granted -
5,988,295.63 € (87%)

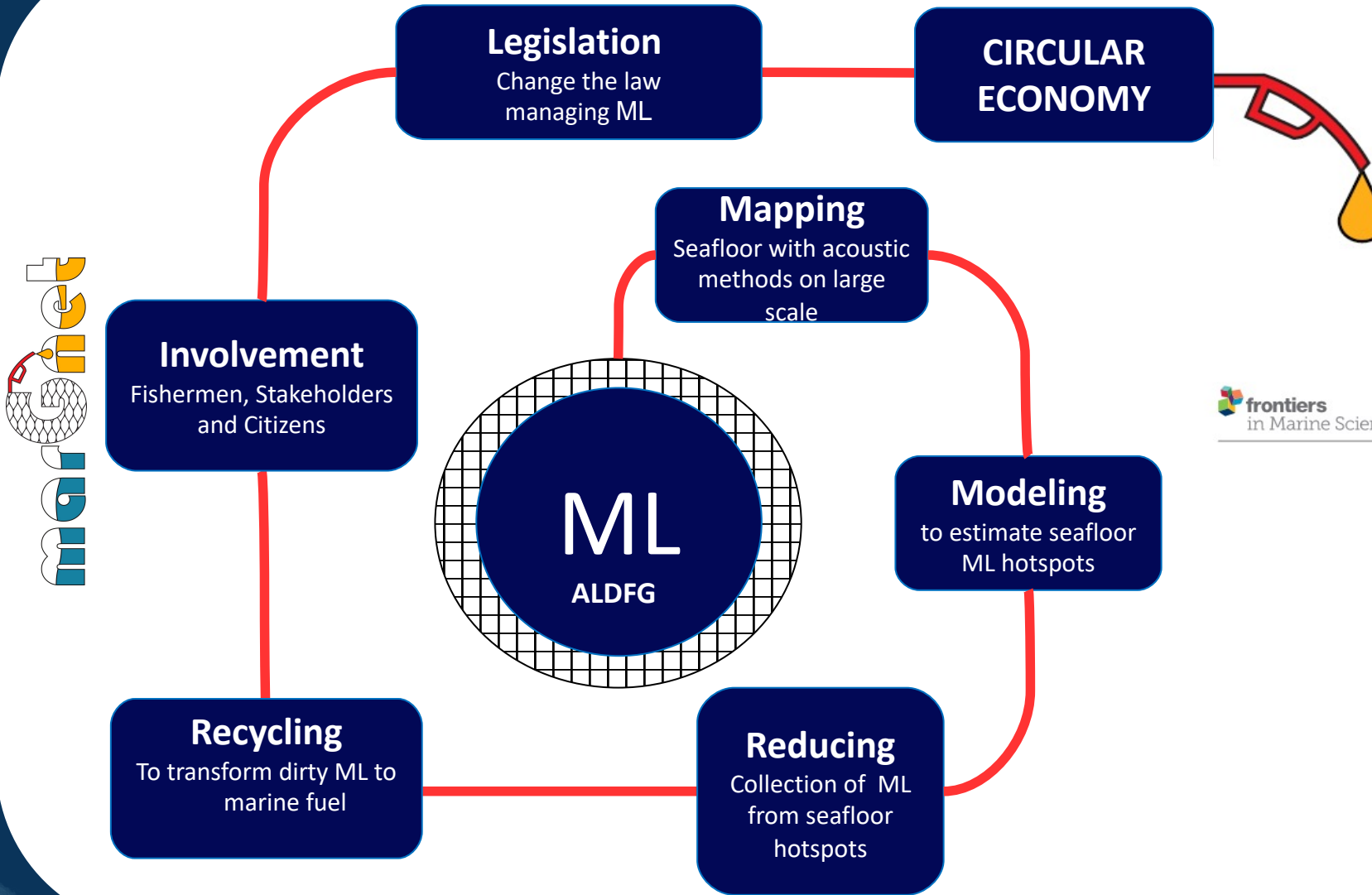
Duration 48 months

Jan 2021-Dec 2024

www.maelstrom-h2020.eu



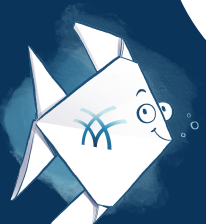
Co-funded by the Horizon 2020 programme
of the European Union



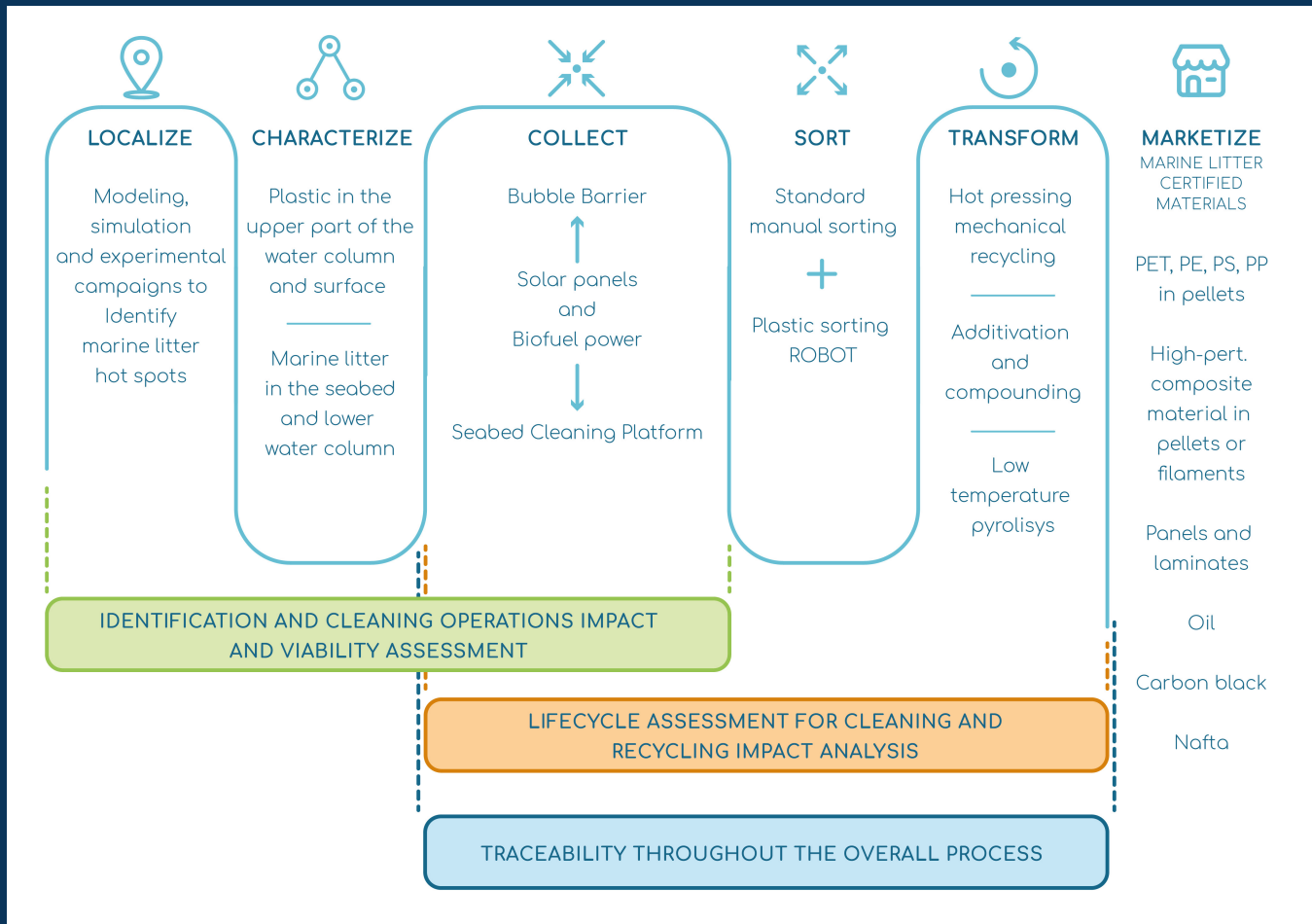
How to Deal With Seafloor Marine Litter: An Overview of the State-of-the-Art and Future Perspectives

Fantina Madricardo^{1*}, Michol Ghezzi¹, Nicoletta Nesto¹, William Joseph Mc Kiver¹, Gian Claudio Faussone², Riccardo Fiorin³, Federico Riccato³, Peter Charles Mackelworth^{4,5}, Jelena Basta⁴, Francesca De Pascalis¹, Aleksandra Kruss¹, Antonio Petrizzo¹ and Vanessa Moschino¹

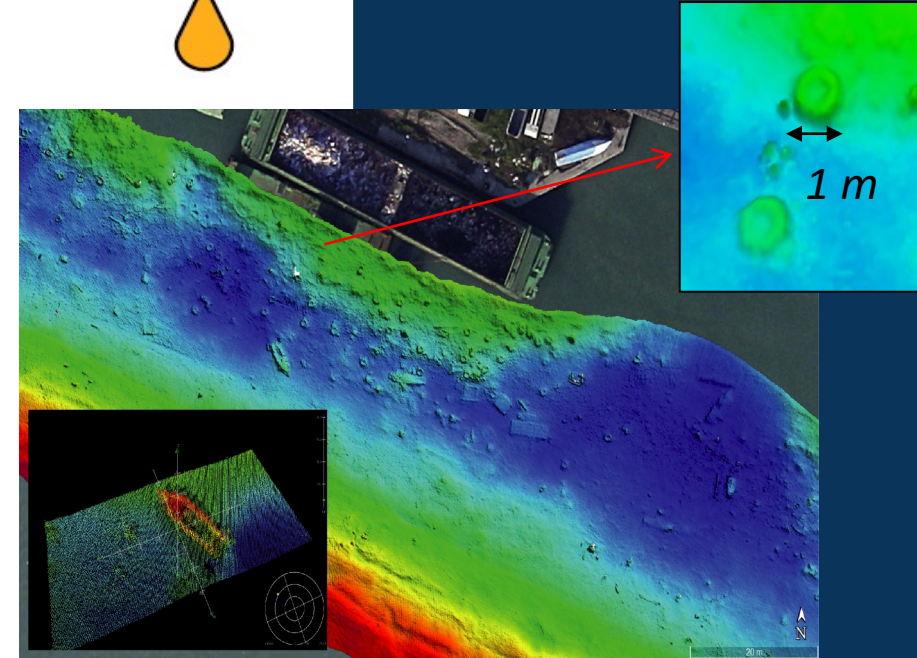
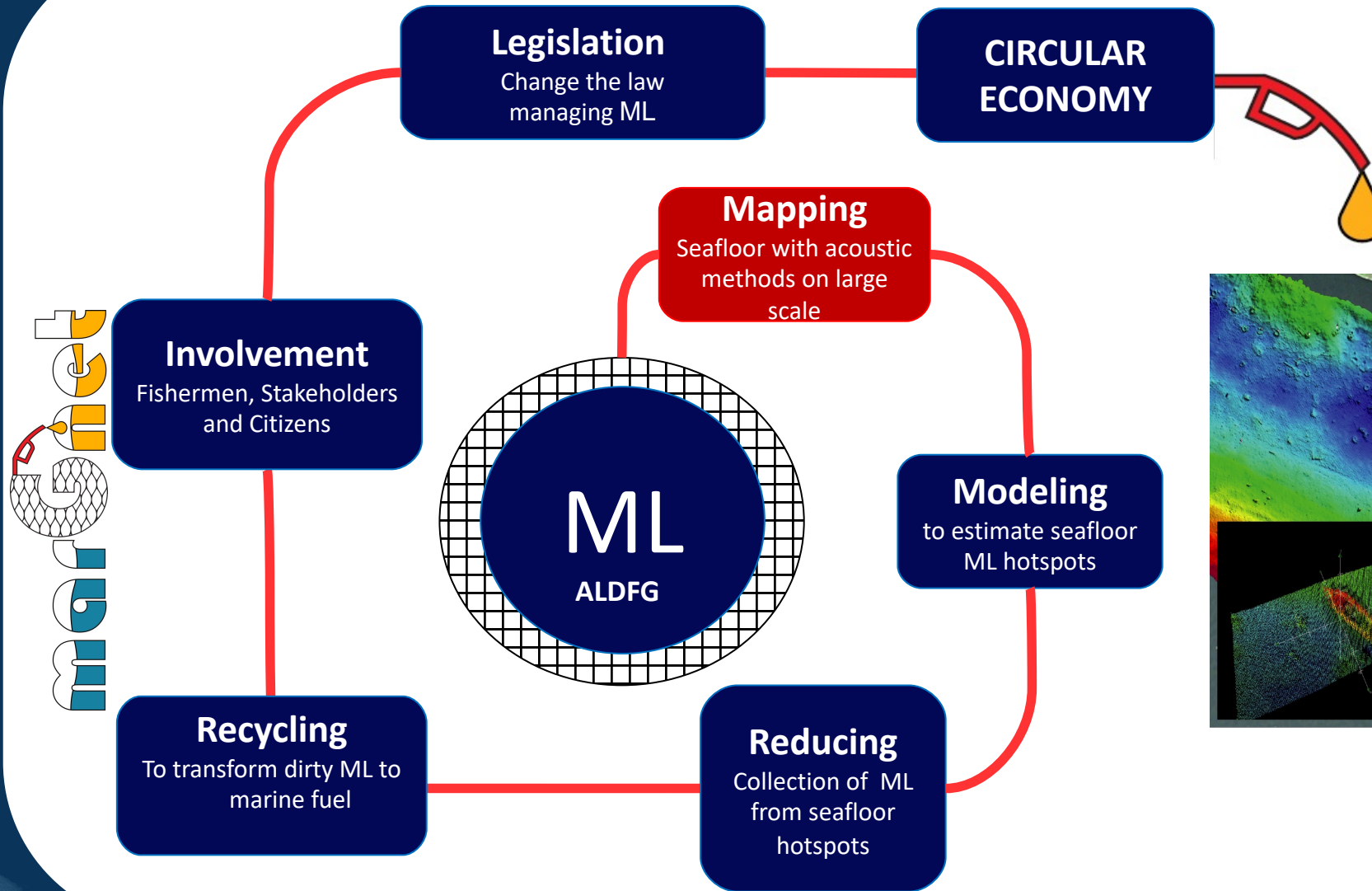
¹ Istituto di Scienze Marine-Consiglio Nazionale delle Ricerche, Venice, Italy, ² SINTOL Srl, Turin, Italy, ³ Laguna Project s.r.l., Venice, Italy, ⁴ Blue World Institute of Marine Research and Conservation – BWI, Veli Losinj, Croatia, ⁵ Institute for Tourism, Zagreb, Croatia



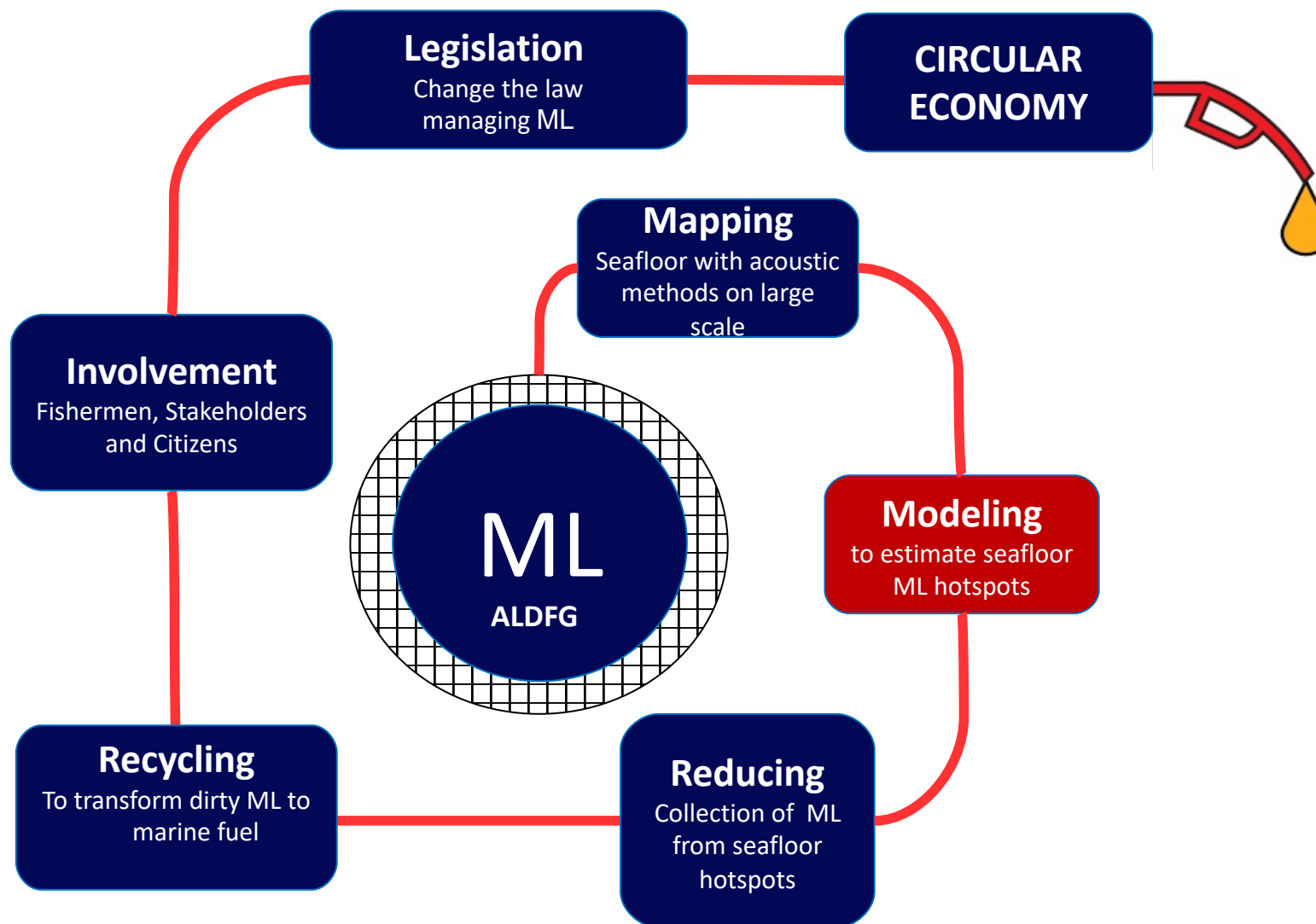
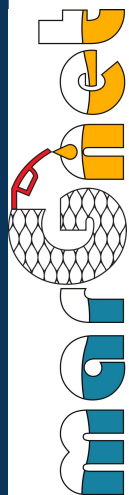
MAELSTROM CONCEPT



MAPPING

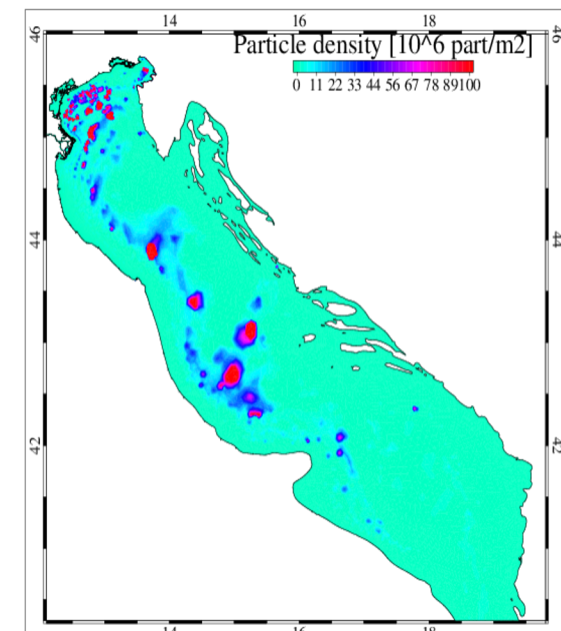


MODELLING



blueMed

Maps of ML hotspots
in the Northern
Adriatic Sea



Maps of ML hotspots
in the Venice and
Porto coastal areas

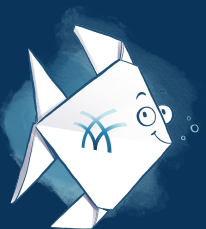


MAELSTROM PILLAR 1: MARINE BIOLOGY

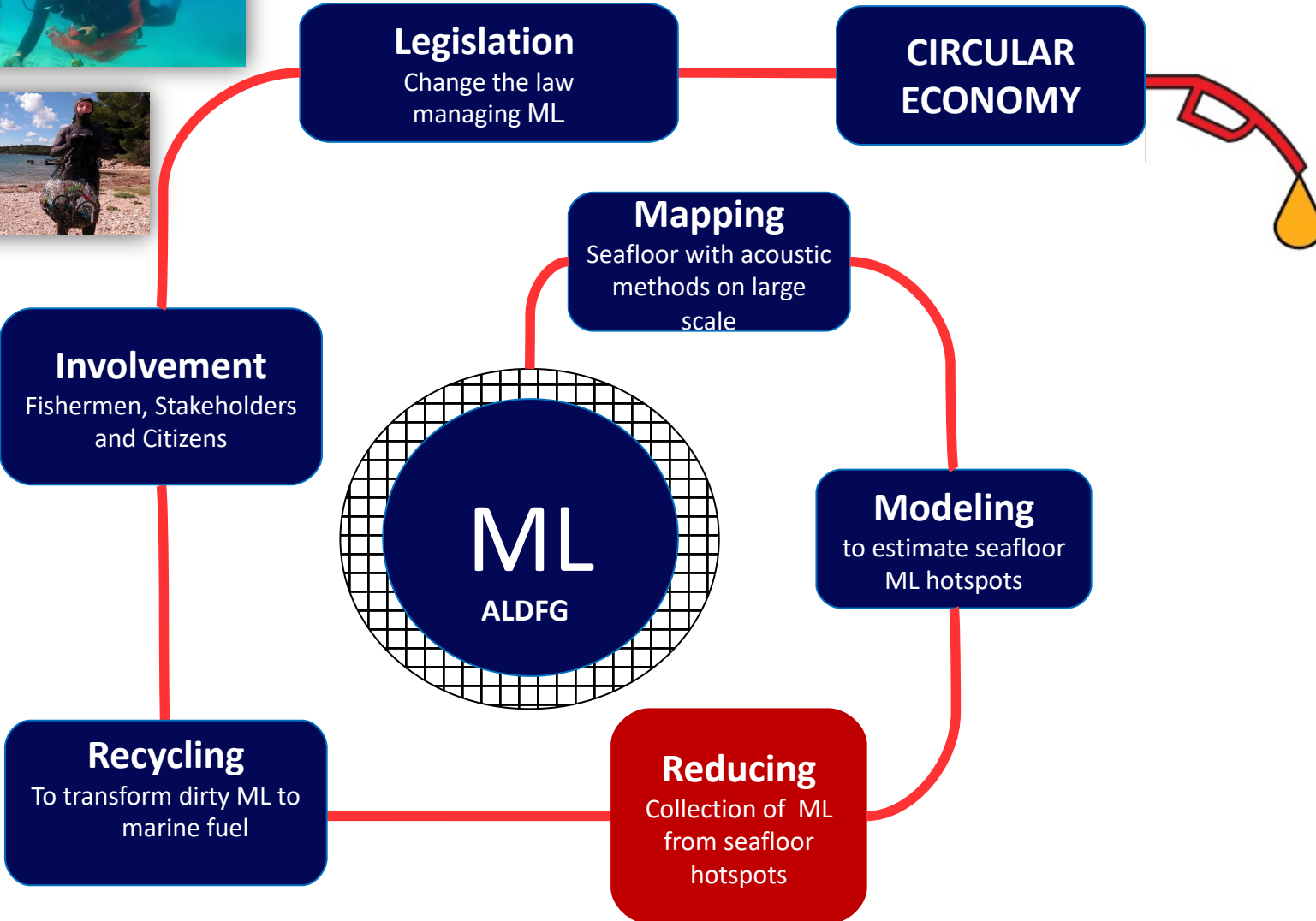
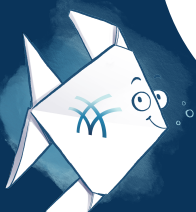
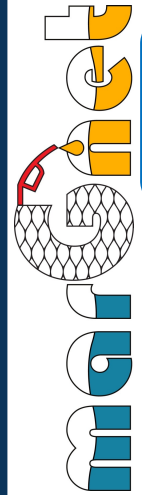
MAELSTROM will set out a scientifically sound and multidisciplinary approach (Integrated Assessment Approach) to:

- **identify** ML accumulation areas in the Demo sites
- **assess** the condition of marine life on them
- **evaluate** the effectiveness and impact of the innovative removal technologies on the marine ecosystems and local economies

WP2 – ML DISTRIBUTION AND ECOSYSTEM ASSESSMENT



REDUCING



New MAELSTROM technologies

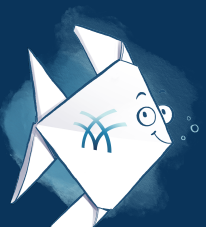
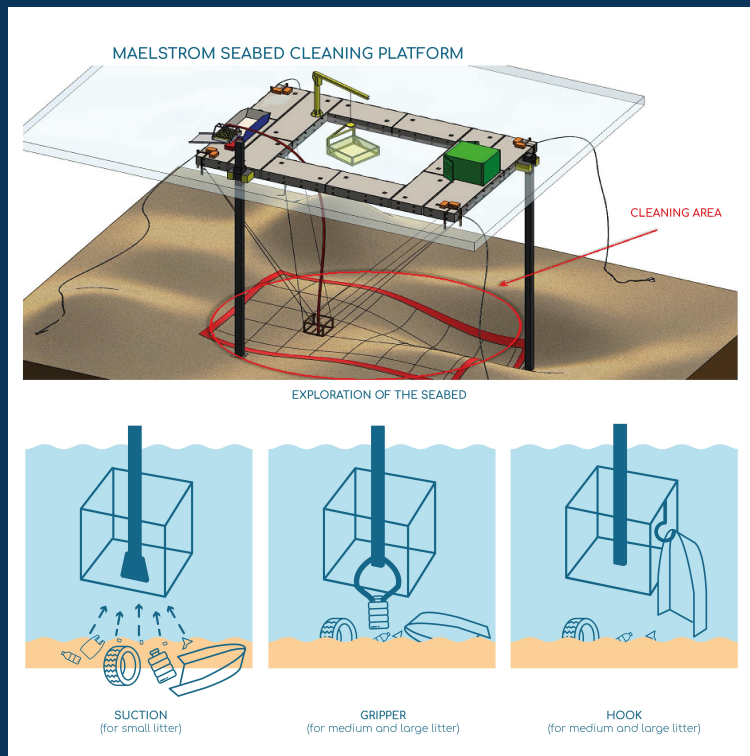


MAELSTROM

MAELSTROM PILLAR 2: MARINE LITTER REMOVAL TECHNOLOGY

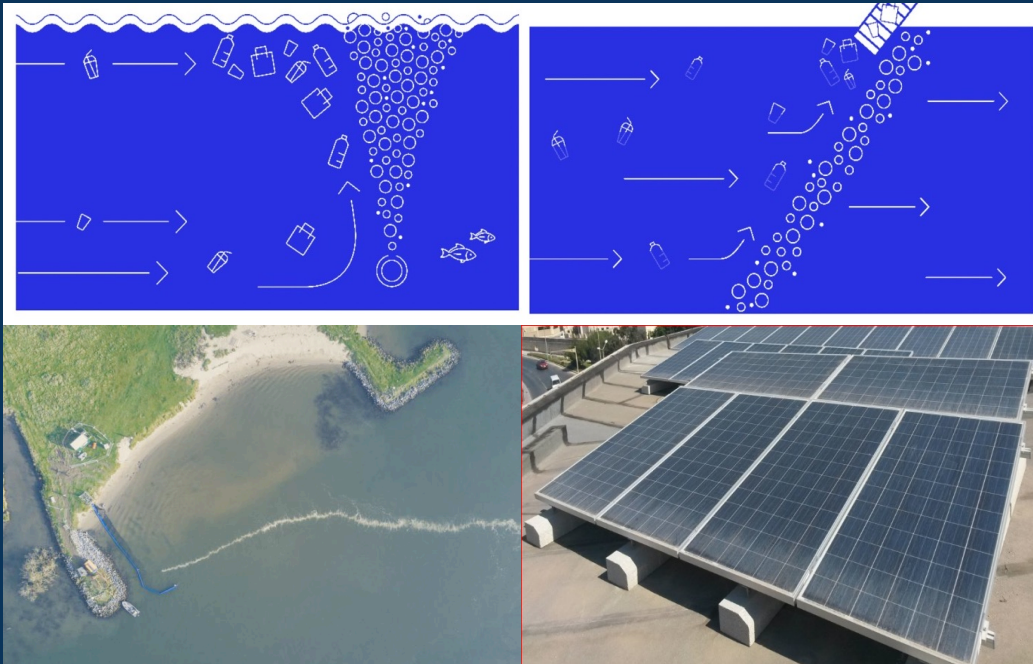
WP3 – SEABED AND LOWER WATER COLUMN CLEANING TECHNOLOGY: CABLE-BASED ROBOTIC PLATFORM

WP5 – ML REMOVAL IN SELECTED DEMOSTRATION SITES

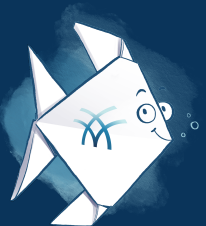
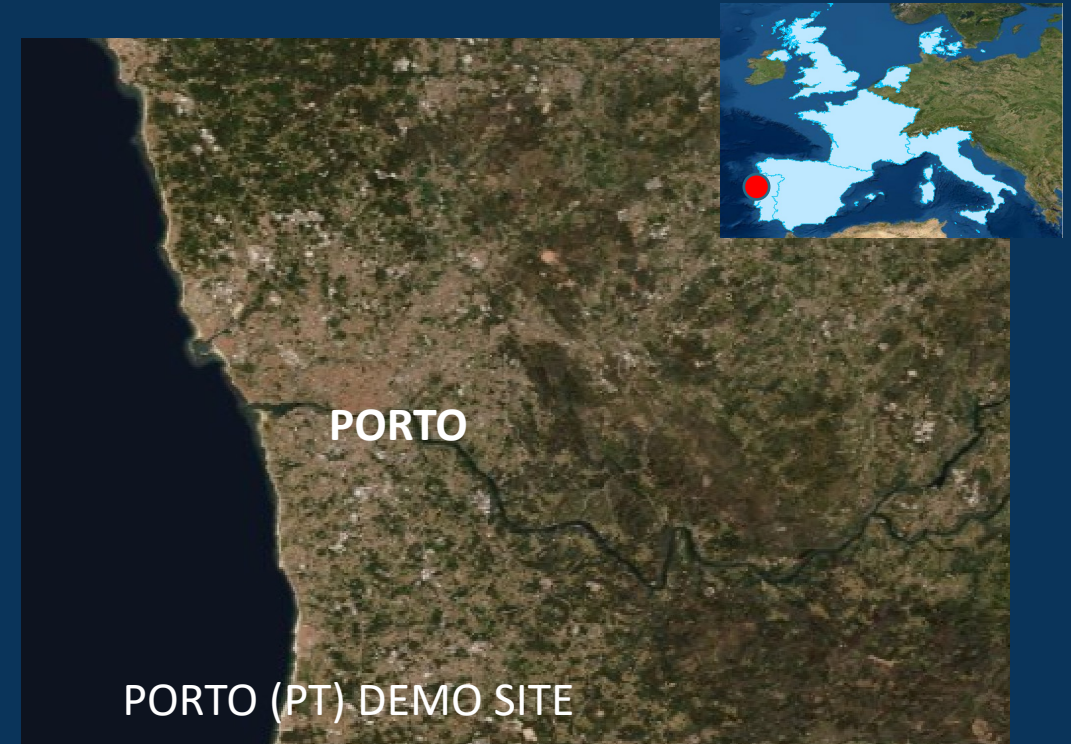


MAELSTROM PILLAR 2: MARINE LITTER REMOVAL TECHNOLOGY

WP4 – SURFACE/WATER COLUMN CLEANING TECHNOLOGY



WP5 – ML REMOVAL IN SELECTED DEMOSTRATION SITES



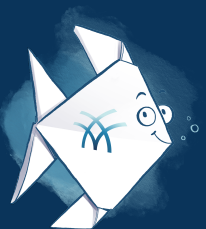
MAELSTROM PILLAR 2: MARINE LITTER REMOVAL TECHNOLOGY

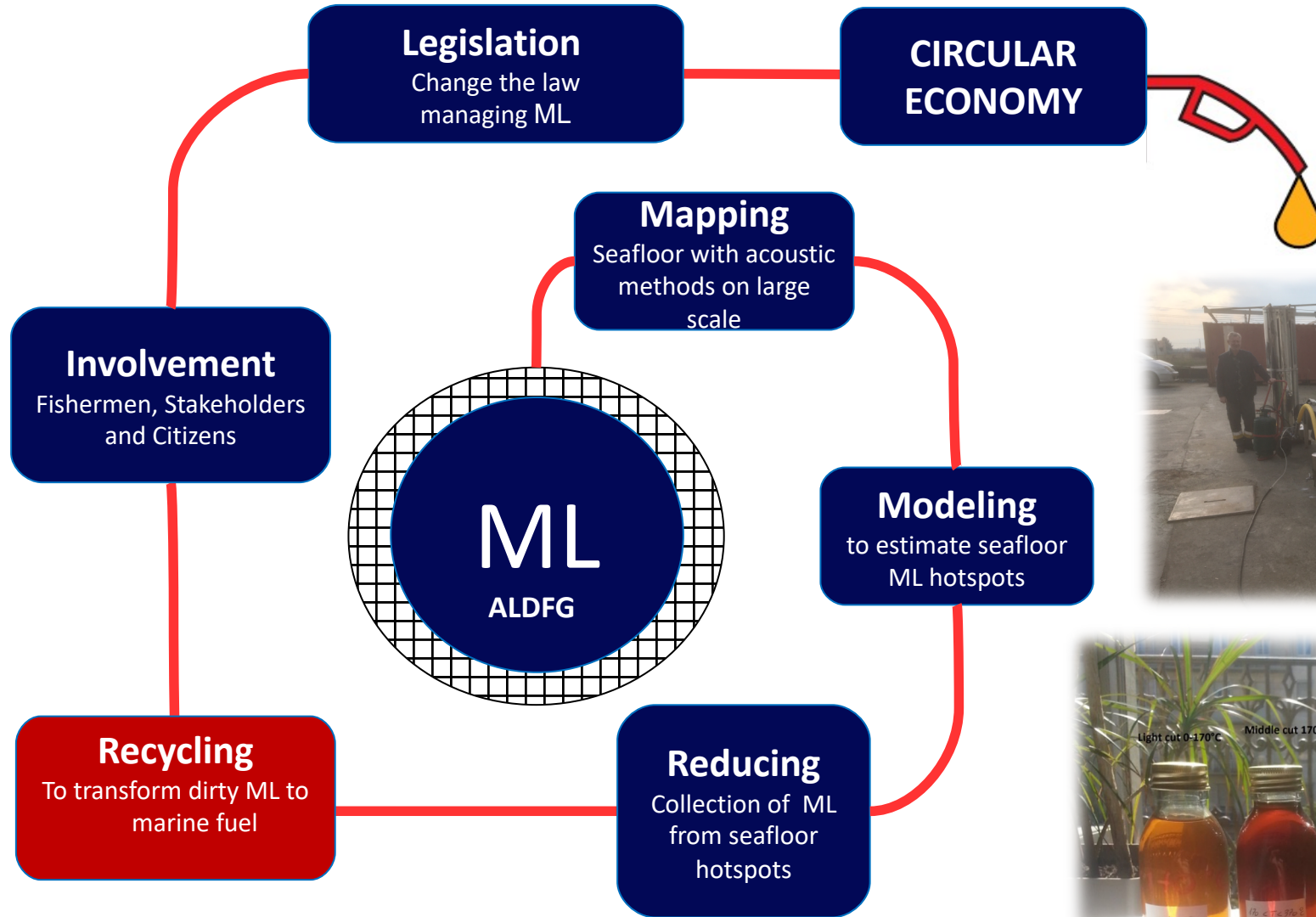
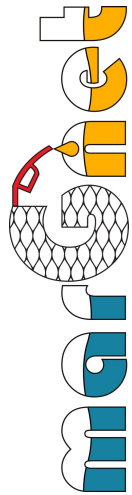
MAELSTROM will contribute to remove the ML from the seafloor in coastal areas ensuring:

- **High selectivity** of the cleaning to minimize the environmental impact
- **High efficiency** through automated and robotized processes

MAELSTROM will contribute to prevent ML to reach the sea ensuring:

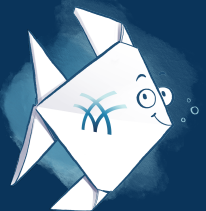
- **No interference** with the fauna and navigation
- Adding **oxygenation** to the water column





RECYCLING MAIN RESULTS

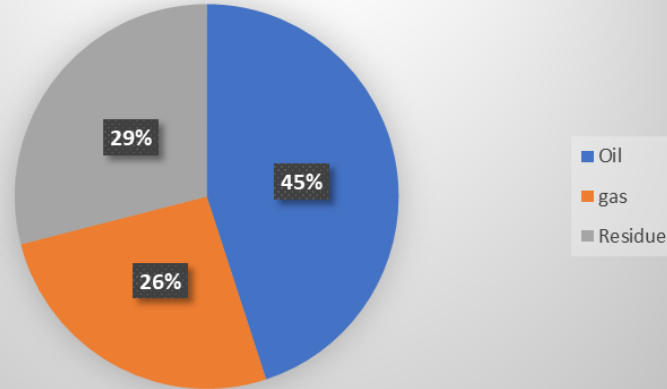
- ✓ Development and test of low temperature pyrolysis prototype for ML recycling into **marine fuel**
- ✓ Over 250 Kg overall material processed without pre-treatment during project period



MAIN RESULTS

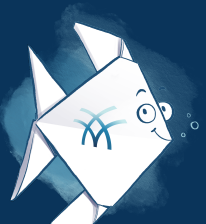
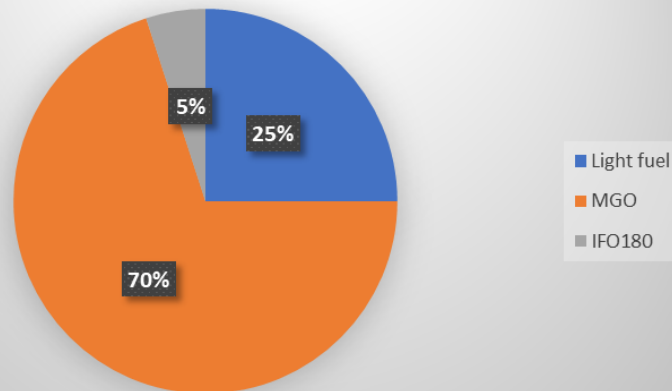
RECYCLING

Mass Balance out of 100 Kg ML



The MGO produced from ML collected in MAELSTROM will be used to co-power the MAELSTROM Seabed Cleaning Platform

Product distribution out of 100 Kg oil



MAELSTROM PILLAR 3: CIRCULAR ECONOMY

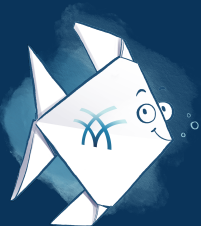
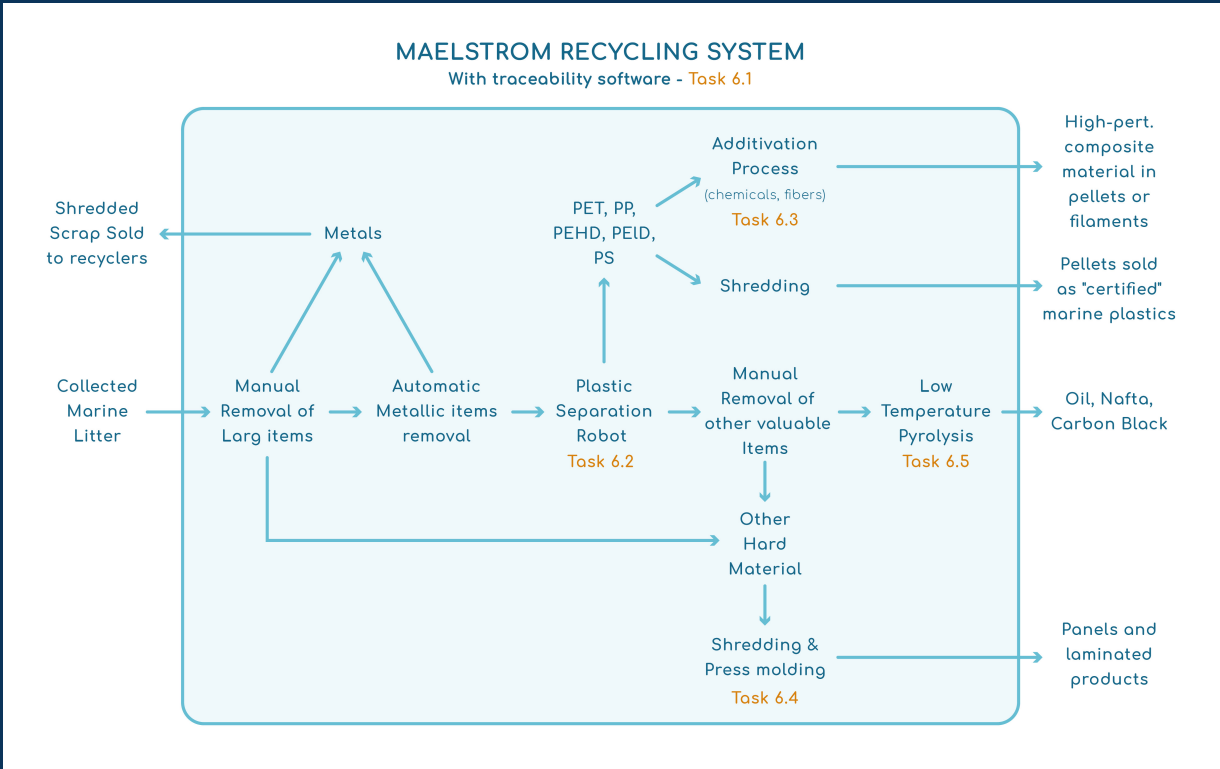


MAELSTROM RECYCLING SYSTEM



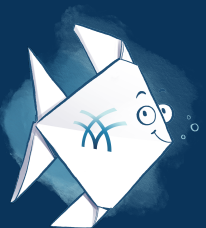
SORTING-ROBOT
BASED ON AI

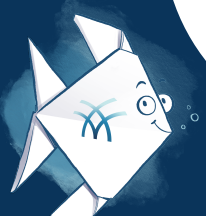
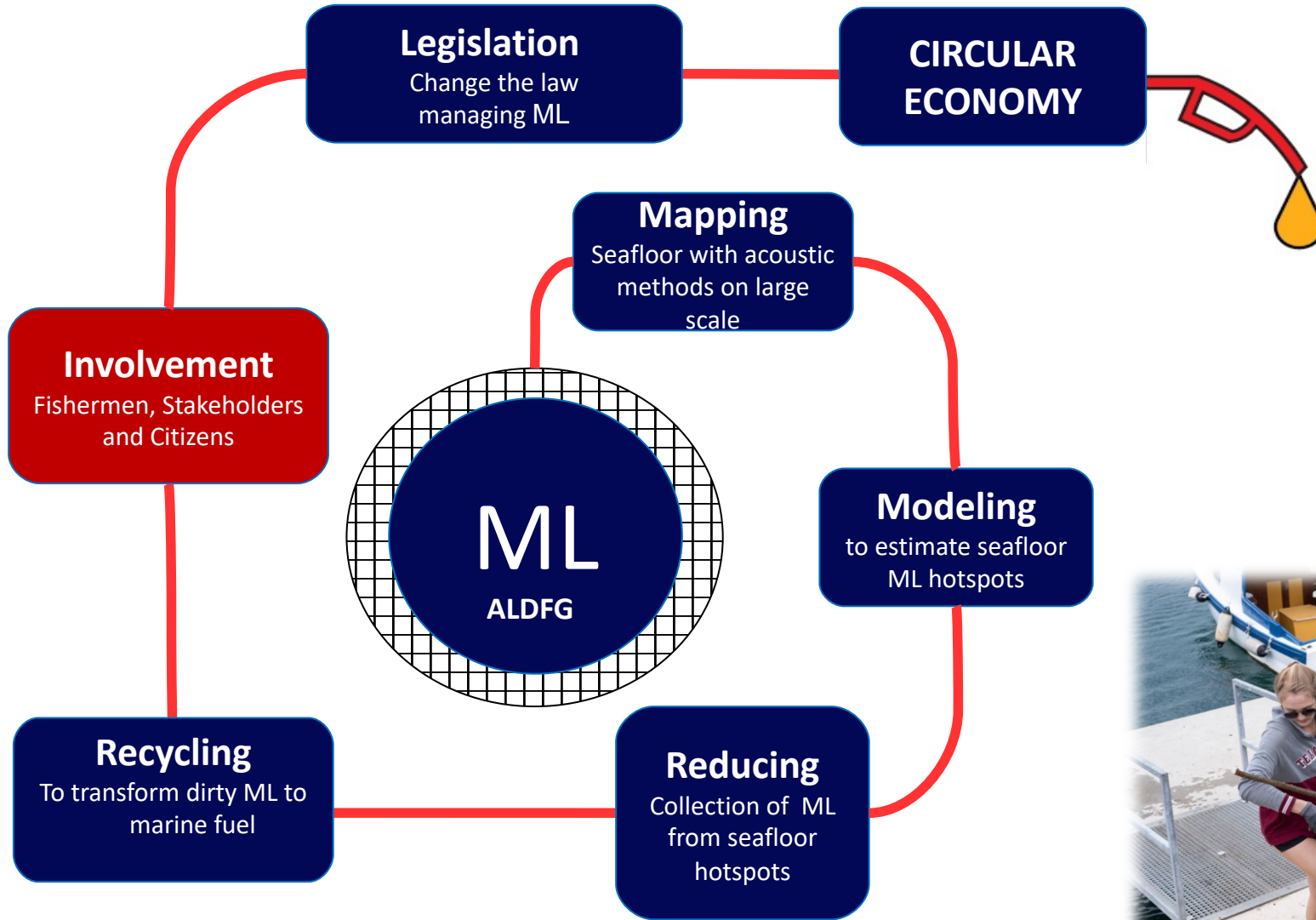
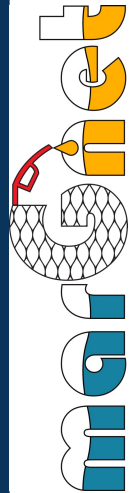
DIFFERENT TYPES OF RECYCLING



BOTTLE NECKS

- ✓ Need to produce less litter
- ✓ Little general awareness about the fate of litter
- ✓ The legislation still makes the recycling of marine litter rather difficult
- ✓ The technologies can be implemented only for small quantities for research purposes
- ✓ Implementations in port areas need long term engagement and investments by local stakeholders





INVOLVEMENT

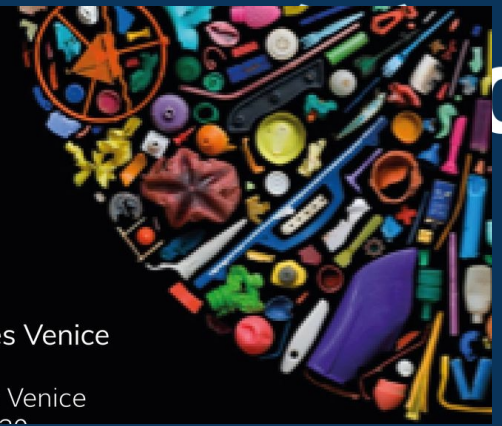
- ✓ **Involvement of fishermen** through seminars, infographics, questionnaires
- ✓ **Involvement of citizen** through events and **art exhibitions** (clean ups, WOD and NET)
- ✓ Dissemination of the project at **large scale events** (ECOMONDO and FAIR) and **demonstrations**
- ✓ **Public demonstration** in Chioggia to **test the prototype** 14 May 2021 at the fish market (**local authorities, fisherman and schools involved**)



NET

Mandy Barker
& CNR Institute
of Marine Sciences Venice

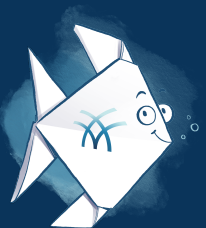
D3082 Woman Art Venice
November 27th 2020



MAELSTROM '4TH PILLAR'

COMMUNICATION, DISSEMINATION and NETWORKING

- Life-sized recycled **plastic whale installation**
- **3 international workshops in Venice** together with the H2020 IN-NO PLASTICS
- **Clean-up campaigns** in Venice, Porto and San Sebastian
- **Two side-events** to demonstrate the removal technologies (Porto- Business2Sea, Venice- International Venice Boat Show)
- **GO GLOCAL** – *think global, act locally!* engage with schools , companies and associations from their local territories and present the project.



MAELSTROM '4TH PILLAR'

COMMUNICATION, DISSEMINATION and NETWORKING

- First **international workshop in Venice** together with the H2020 IN-NO PLASTICS took place on the 3rd of June at the International Venice Boat show
- **First Clean-up campaign** in Venice, Saturday, 5th of June, 2021 in occasion of the World Environmental Day
- Partner events in the EU GREEN WEEK 2021

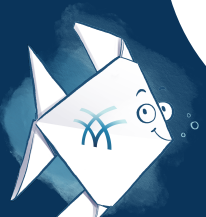
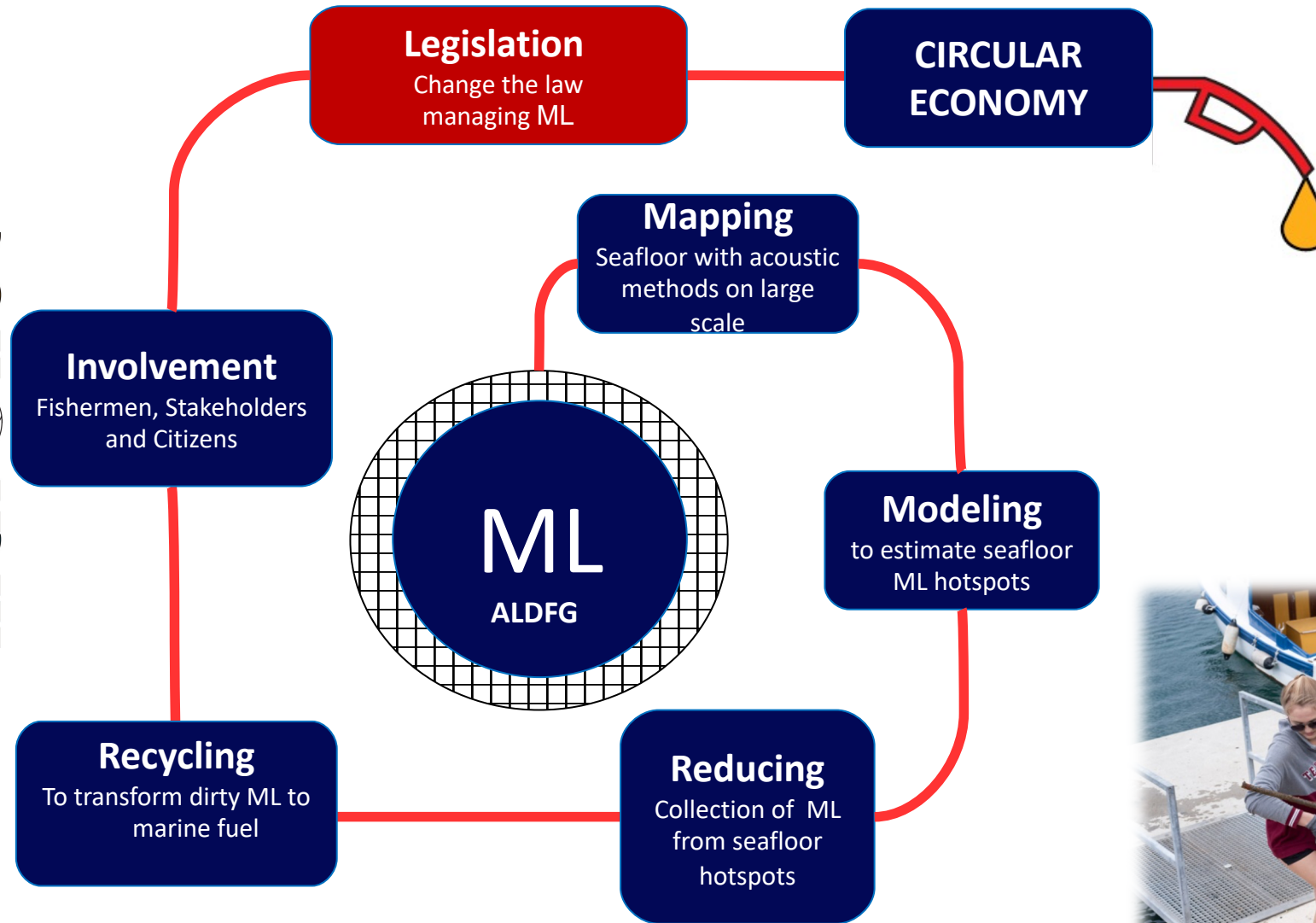
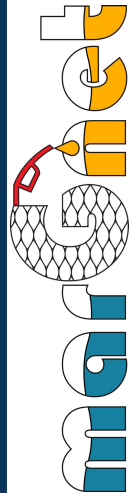


MAELSTROM '4TH PILLAR'

COMMUNICATION, DISSEMINATION and NETWORKING

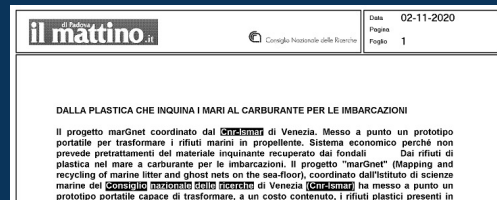
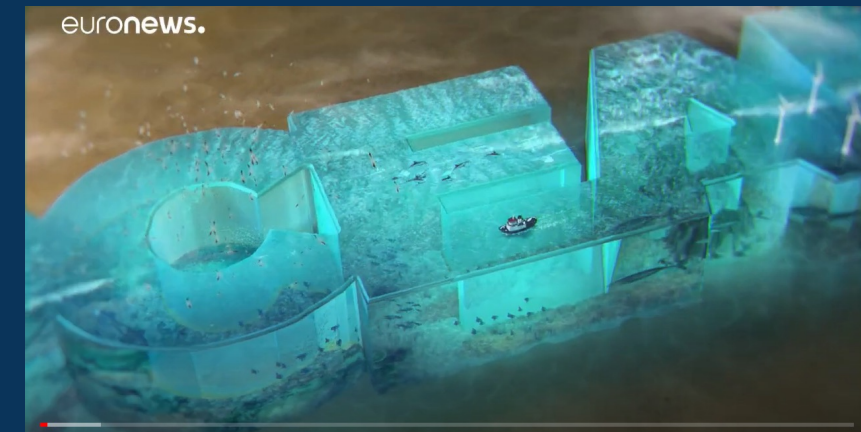
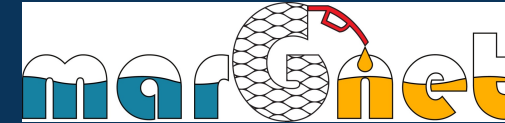
- Second Clean-up campaign in Porto, Saturday, 18th of September, 2021 in occasion of the World Clean Up Day
- Relization of a life siAgreement with the Polietilene Consortium to realize the life size whale





LEGISLATION and MEDIA

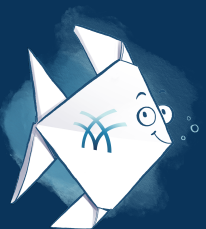
- ✓ Involvement of **relevant local, national and European political stakeholders** to overcome legislative barriers
- ✓ Hopefully the **media interest** awaken by marGnet and MAELSTROM will help to induce legislative changes

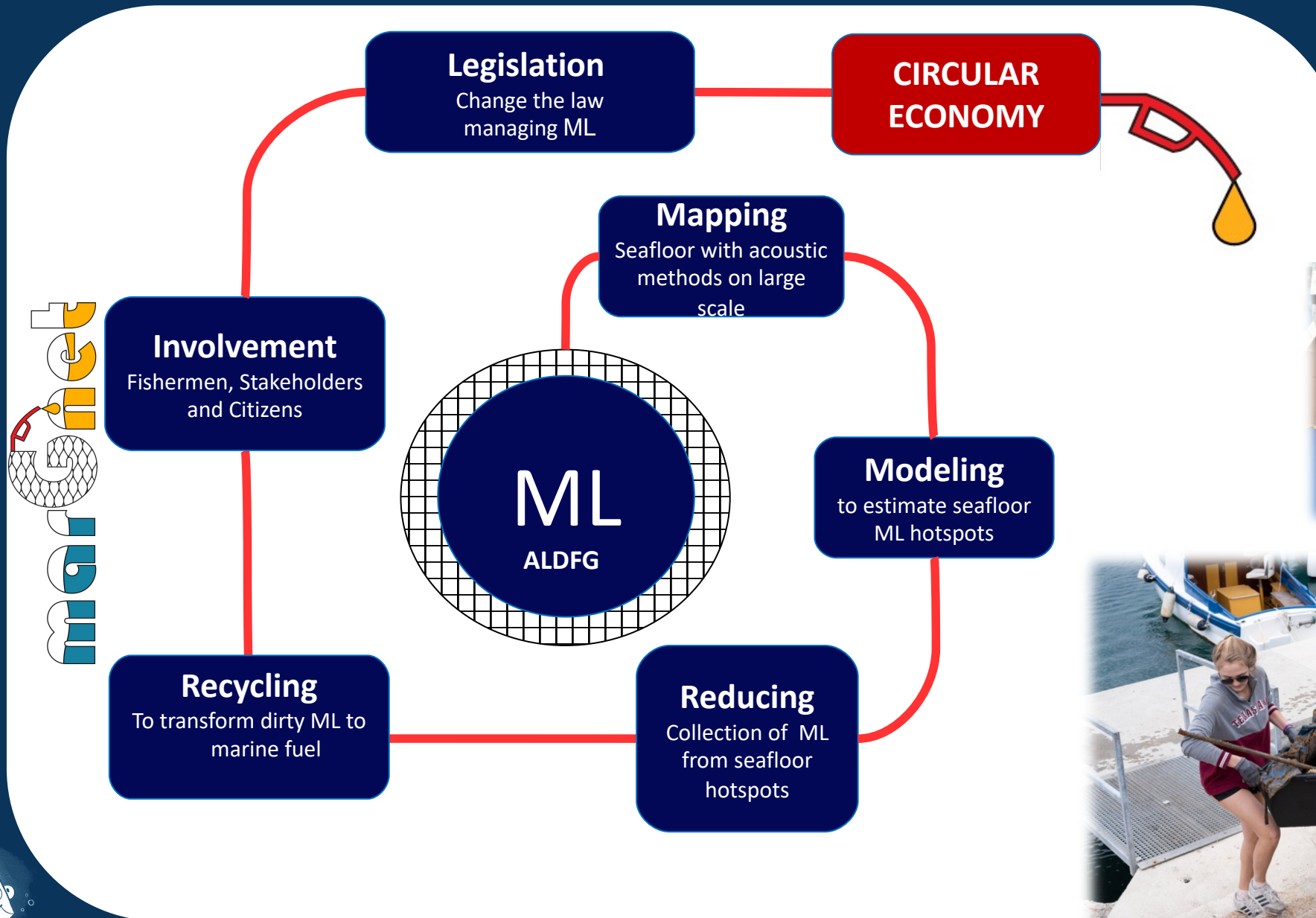


MAELSTROM PILLAR 3: CIRCULAR ECONOMY

- **Interactive Forum** with other European projects (<https://www.maelstrom-h2020.eu/registration/>)
- **Thematic European working group** focused on ML and plastic removal/recycling and management
- Support to the **EU Strategy for Plastics in the Circular Economy**

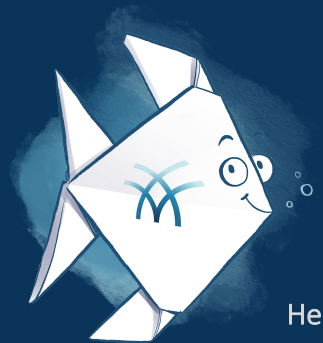
**WP7 – COORDINATION AND INTEGRATION OF BLUE
TECHNOLOGY FOR EU PLASTIC STRATEGY**





WE NEED YOUR HELP TO CLOSE THE CIRCLE!

- ✓ Political support to change the legislation in order to be able to produce new resources from ML
- ✓ Stakeholders support to locally adopt and implement these technological solutions in ports and coastal areas





MAELSTROM

MArinE Litter SusTainable RemOval and Management

THANK YOU FOR THE ATTENTION!

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To know more please visit:

www.margnet.eu and www.maelstrom-h2020.eu

