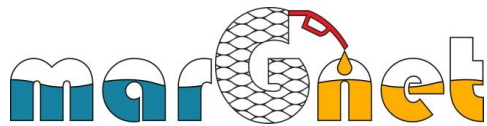


CINEA Workshop on  
“Integration, scaling up and cooperation”

A multilevel approach  
to the marine litter issue:  
from marGnet to MAELSTROM



Fantina Madricardo  
CNR-ISMAR



Co-funded by the European  
Maritime and Fisheries Fund

February 28, 2022



Co-funded by the Horizon 2020 programme  
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CNR ISMAR

Deltares



iSDi  
INTERNATIONAL SUSTAINABLE  
DEVELOPMENT INSTITUTE



cimca  
RESEARCH  
FOUNDATION

tecnalia

Alpha Consult



MAKEEN  
POWER



CNRS  
CENTRE NATIONAL  
DE LA RECHERCHE  
SCIENTIFIQUE

# margnet

5 PARTNER

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

Jan 2019-Dec 2020

[www.margnet.eu](http://www.margnet.eu)



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# MAELSTROM

MArinE Litter SusTainable RemOval and Management

14 PARTNER

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

Jan 2021-Dec 2024

[www.maelstrom-h2020.eu](http://www.maelstrom-h2020.eu)



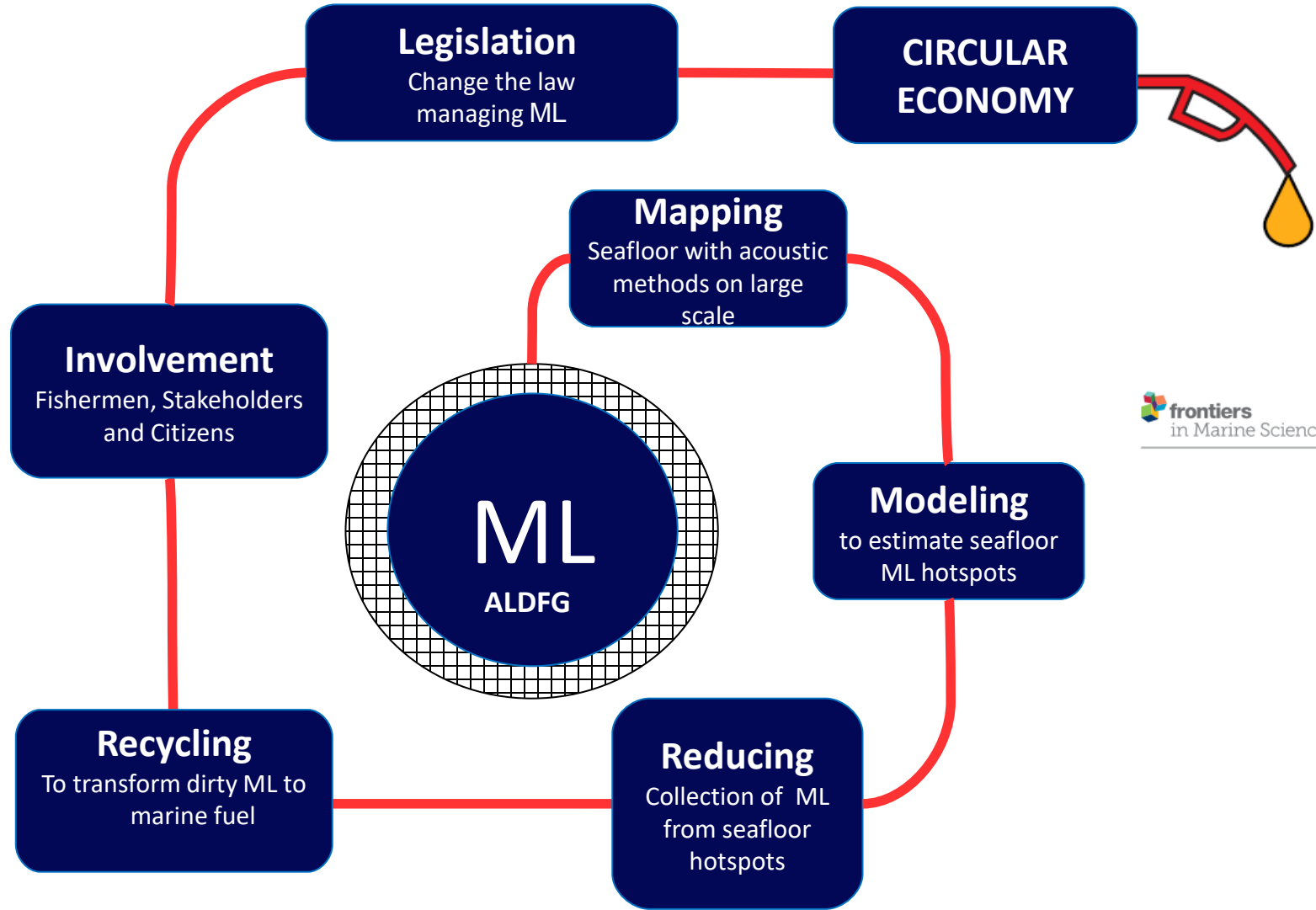
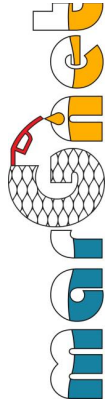
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CNR ISMAR



SINTOL techneprojects  
GROWING UP PROJECTS



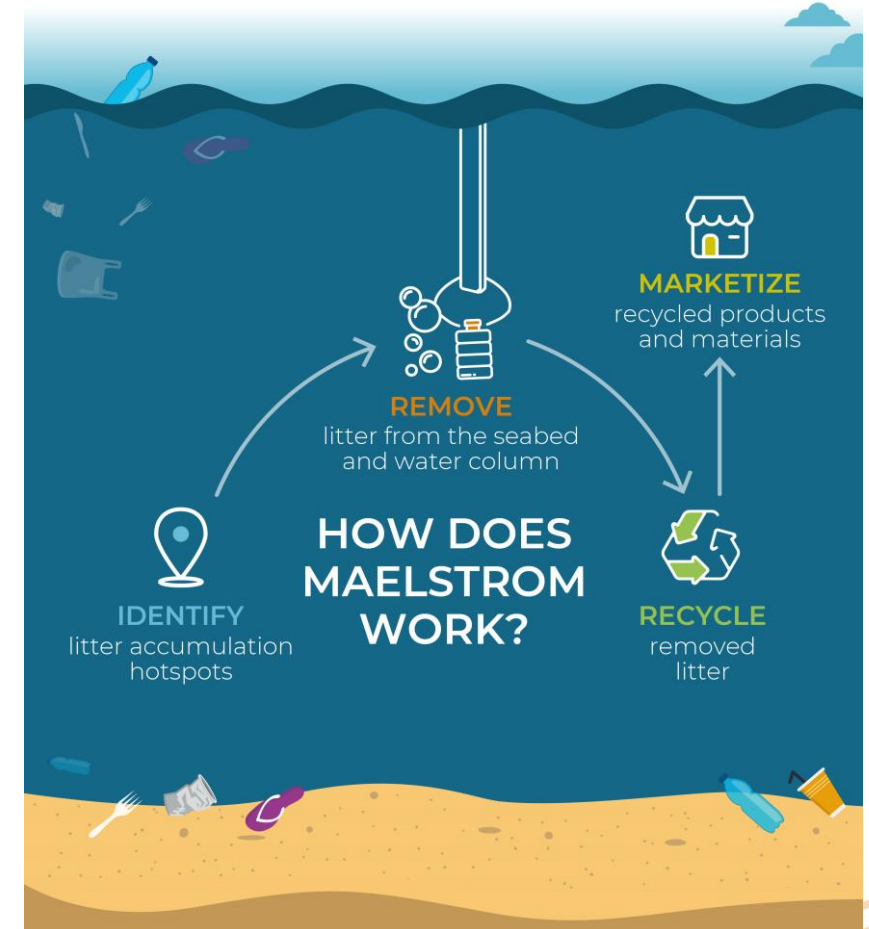
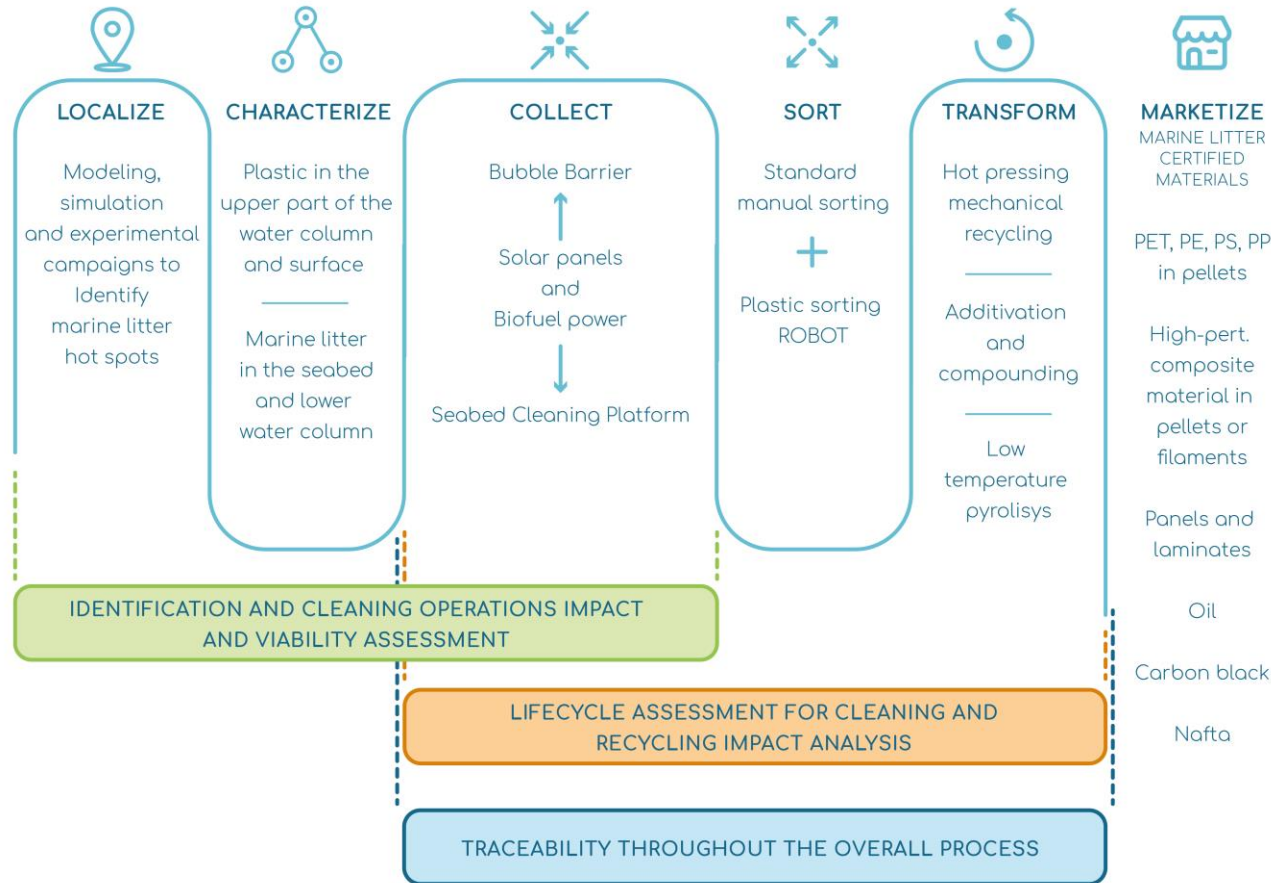
## How to Deal With Seafloor Marine Litter: An Overview of the State-of-the-Art and Future Perspectives

Fantina Madricardo<sup>1\*</sup>, Michol Ghezzi<sup>1</sup>, Nicoletta Nesto<sup>1</sup>, William Joseph Mc Kiver<sup>1</sup>, Gian Claudio Faussone<sup>2</sup>, Riccardo Fiorin<sup>3</sup>, Federico Riccato<sup>3</sup>, Peter Charles Mackelworth<sup>4,5</sup>, Jelena Basta<sup>4</sup>, Francesca De Pascalis<sup>1</sup>, Aleksandra Kruss<sup>1</sup>, Antonio Petrizzo<sup>1</sup> and Vanessa Moschino<sup>1</sup>

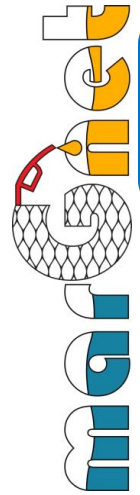
<sup>1</sup> Istituto di Scienze Marine-Consiglio Nazionale delle Ricerche, Venice, Italy, <sup>2</sup> SINTOL Srl, Turin, Italy, <sup>3</sup> Laguna Project s.r.l., Venice, Italy, <sup>4</sup> Blue World Institute of Marine Research and Conservation – BWI, Veli Losinj, Croatia, <sup>5</sup> Institute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



# MAELSTROM CONCEPT



# REDUCING



**Involvement**  
Fishermen, Stakeholders  
and Citizens

**Recycling**  
To transform dirty ML to  
marine fuel

**Legislation**  
Change the law  
managing ML

**Mapping**  
Seafloor with acoustic  
methods on large  
scale

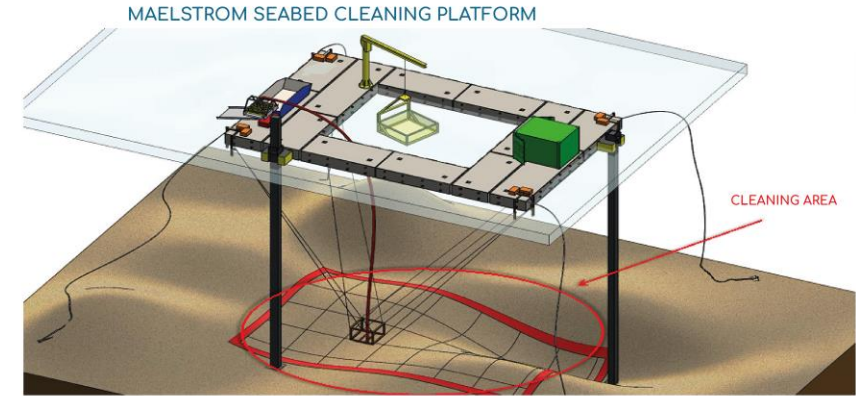
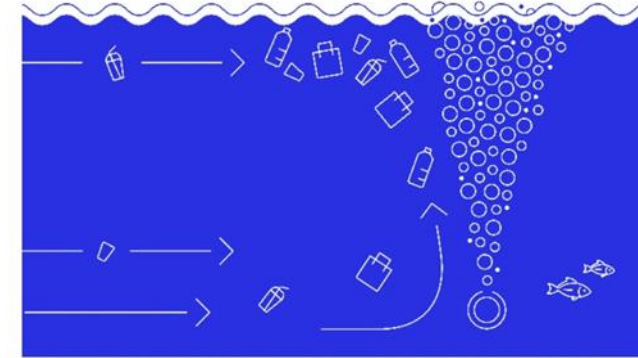


**CIRCULAR  
ECONOMY**

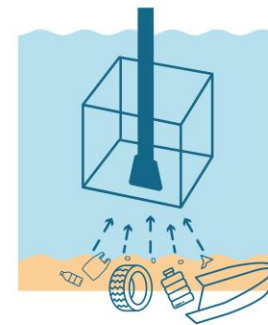
**Modeling**  
to estimate seafloor  
ML hotspots

**Reducing**  
Collection of ML  
from seafloor  
hotspots

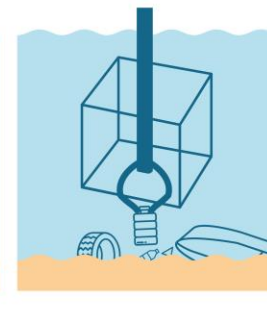
## New MAELSTROM Removal technologies



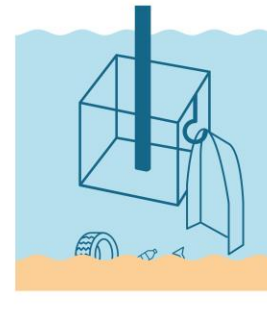
EXPLORATION OF THE SEABED



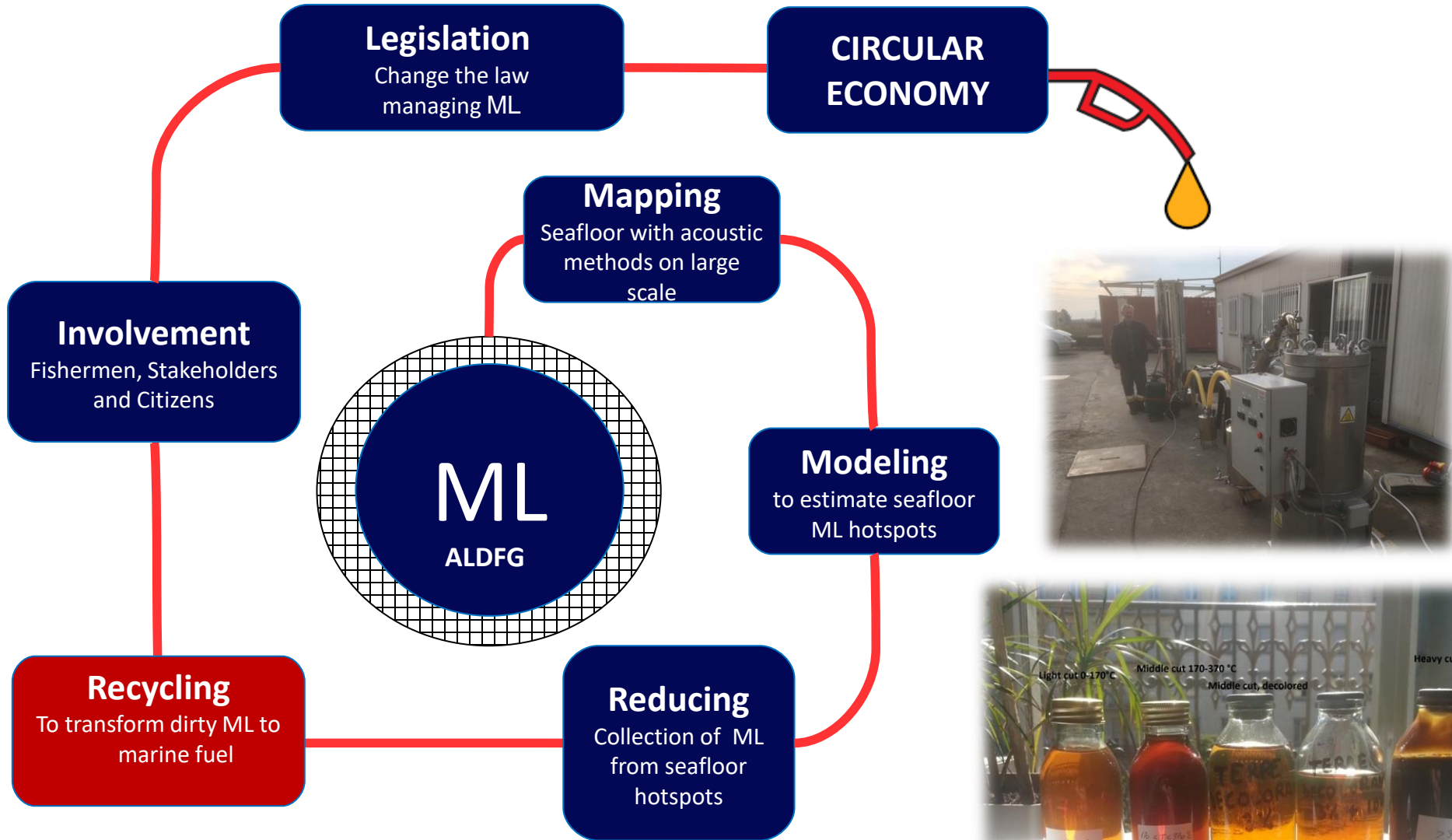
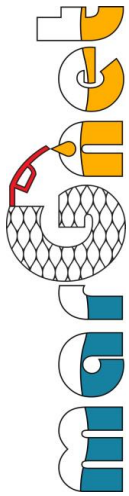
SUCTION  
(for small litter)



GRIPPER  
(for medium and large litter)

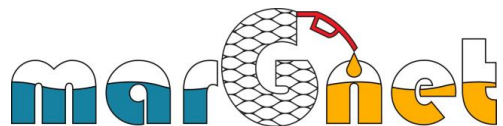


HOOK  
(for medium and large litter)

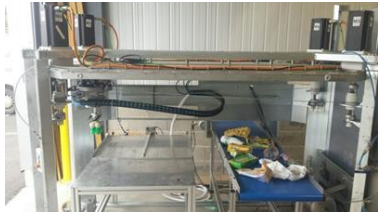
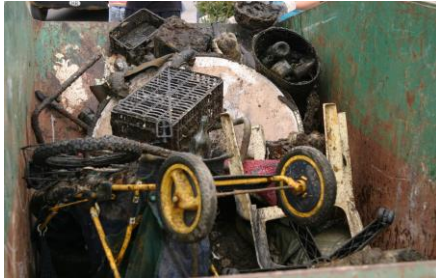


## RECYCLING MAIN RESULTS

- ✓ Development and test of low temperature pyrolysis prototype for ML recycling into Low Sulfur Marine Gas Oil (MGO) DMA ISO8217 compliant (~50/60 wt%)
- ✓ Over 250 Kg overall material processed without pre-treatment during project period



# MAELSTROM: CIRCULAR ECONOMY

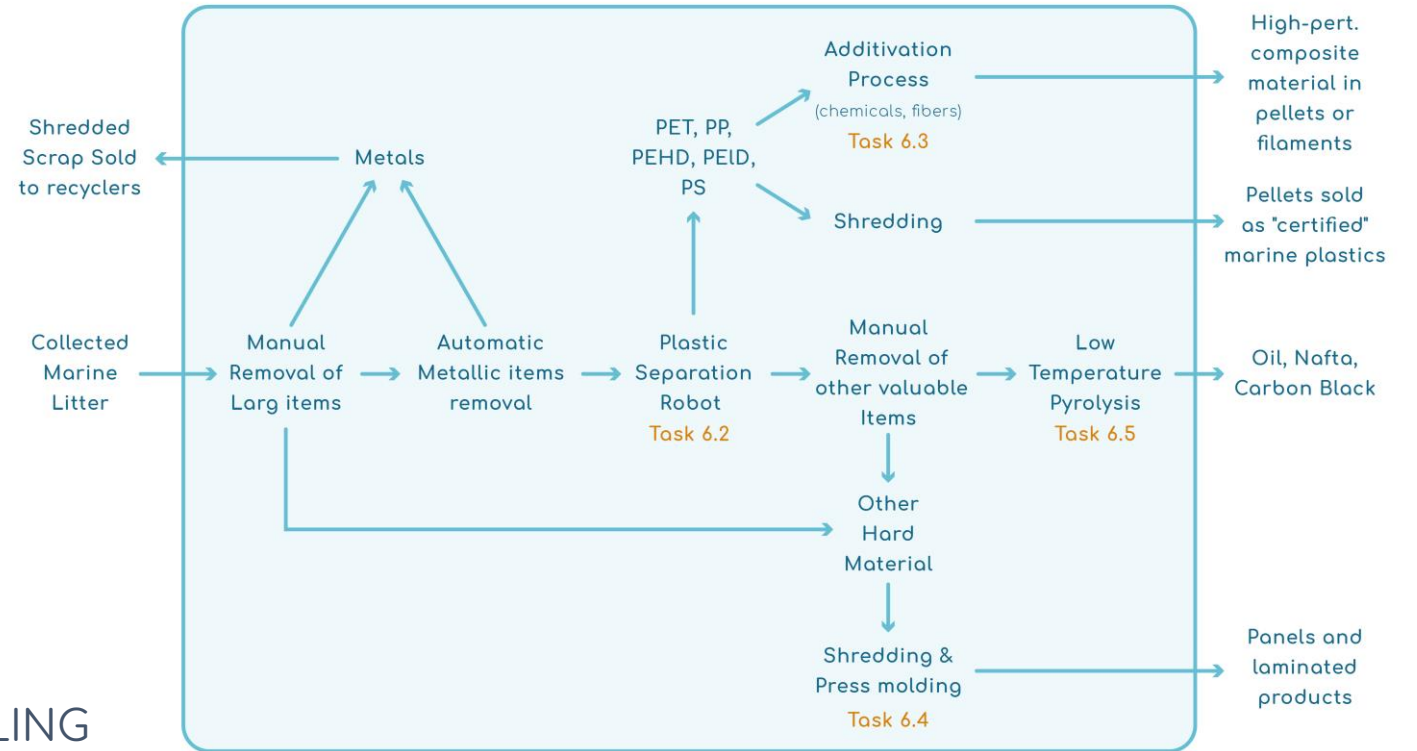


SORTING-ROBOT  
BASED ON AI

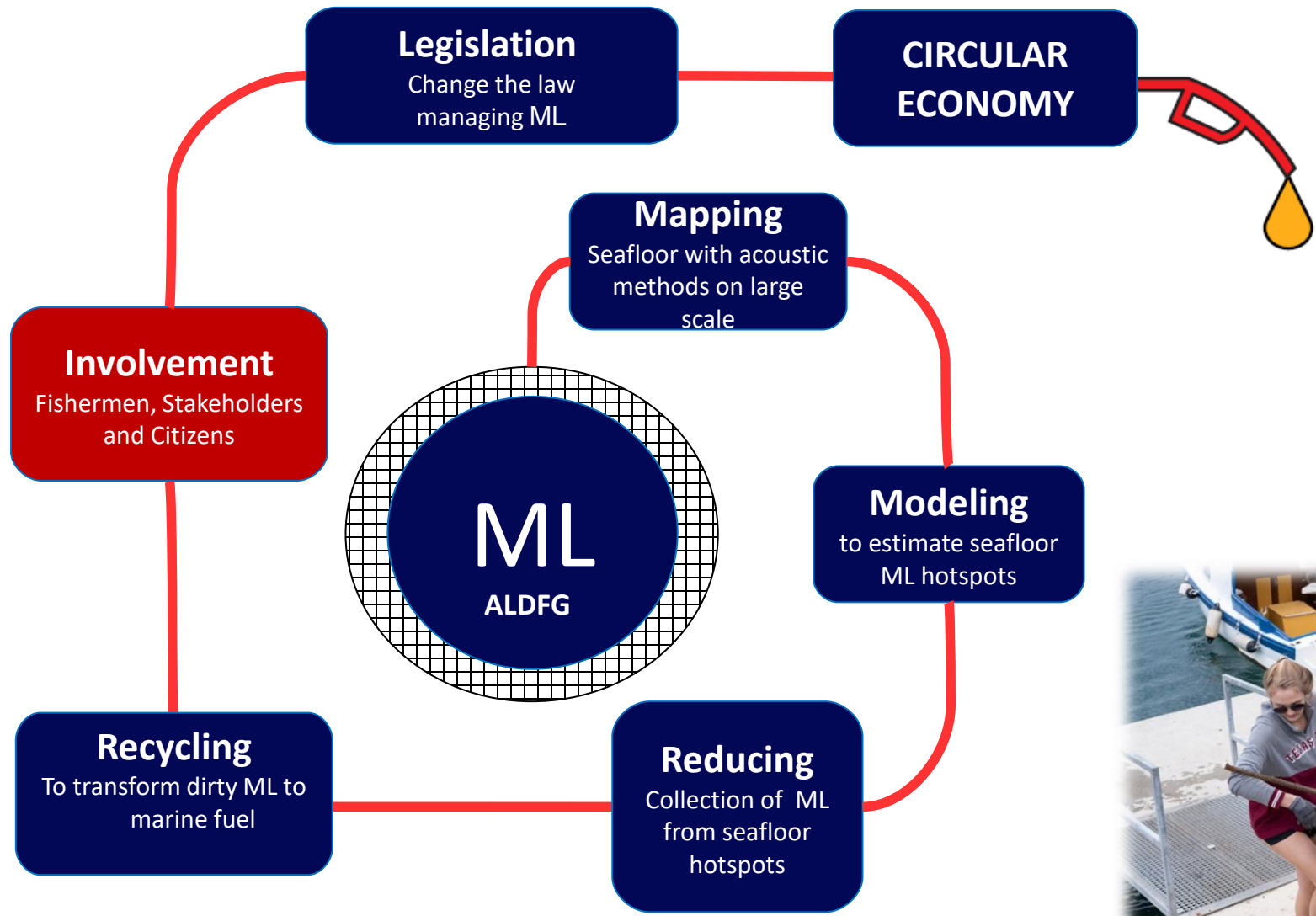
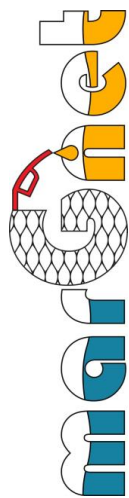
DIFFERENT TYPES OF RECYCLING

## MAELSTROM RECYCLING SYSTEM

With traceability software - Task 6.1



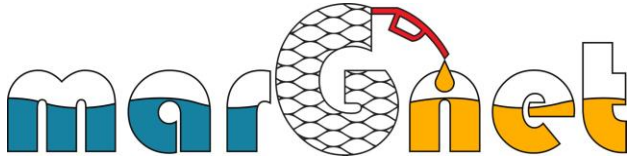




## LEGISLATION & BOTTLE NECKS

- ✓ 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
- ✓ Political support is needed to change the legislation in order to be able to produce new resources from ML





MAELSTROM  
MArInE Litter SuStainable RemOval and Management

THANK YOU FOR THE ATTENTION!

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[fantina.madricardo@ismar.cnr.it](mailto:fantina.madricardo@ismar.cnr.it)

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<https://www.maelstrom-h2020.eu/forums/forum/maelstrom-forum/>

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