

KEY RESULTS



Taking stock of **three years of collaboration** to address marine litter and ghost gear through innovative technology, scientific research and dedicated **educational programmes**



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Why NETTAG+ matters

Abandoned, Lost or otherwise Discarded Fishing Gear (ALDFG) is one of the most harmful and persistent forms of marine litter. Fisheries are among the activities most affected by marine litter.

Environmental impacts



The opportunity for innovation

Limited tracking, lack of recovery and prevention solutions

KEY DELIVERABLES



**Tailored educational
and participatory
materials**



**Innovative tracking
and retrieval
technologies**



**Policy
recommendations
and cross-border
cooperation**

Watch our **final project video** and see these technologies and policy frameworks in action across the Atlantic and Mediterranean.

All NETTAG+ resources, including our **complete findings, technical specifications and full reports**, are available for download on the [NETTAG+ website](#).

Thank you for joining us in building a smarter, cleaner future for our seas and oceans.



Marine litter: where it comes from

A significant share of marine litter comes from maritime activities

€60M/year
cost to EU fisheries
(~5% of revenue)¹

Only 27%
of ship-generated waste globally
is delivered to Port Reception
Facilities (PRFs)²

22%
of marine litter
is sea-based³

¹ European Commission et al. 2024
² Øhlenschläger et al., 2013
³ Morales-Caselles et al., 2021



THE PROJECT AT A GLANCE



NETTAG+ brought together **15 partners** from across the **Atlantic** and **Mediterranean** to strengthen marine protection and ensure a shared, cross-regional approach.

- ✓ Technological innovations
- ✓ Solutions co-designed and tested with fishers
- ✓ Analysis and policy recommendations
- ✓ Scientific evidence on microplastics, hazardous chemicals and pathogenic agents
- ✓ Educational tools



PREVENT

Educational materials for fishers



Through a participatory approach involving fishers' associations and fishing communities in the development of training and awareness activities, NETTAG+ helped promote **a new narrative** around fishers, recognising them not as part of the problem, but as **key actors in protecting and cleaning the ocean**.

 **Find out more**
All our content is available
in six languages

-  Developed a package of workshops on marine litter, bycatch reduction and sustainable fishing practices
-  Produced multilingual awareness materials in Croatian, English, Italian, Maltese, Portuguese and Spanish
-  Helped fishing communities better understand waste management, ghost fishing and the environmental impacts of fisheries
-  Worked with fishers' associations to ensure the tools reflected the realities and needs of the sector
-  Promoted practical solutions to better manage onboard waste and marine litter
-  Made all resources freely available online to support future awareness and training initiatives
-  Developed a best practise handbook for waste management

PREVENT

Fisher feedback

Based on the workshops, NETTAG+ produced a report analysing feedback from 259 participants, including **238 small- and large-scale fishers**, across **five countries**.

Key findings & takeaways

High environmental awareness exists, but is constrained by financial, infrastructural, and technological barriers.

Incentive-based approaches are preferred over penalties to encourage reporting and sustainable practices.

Fear of legal consequences limits reporting of bycatch, despite awareness of its impacts.

Strong interest in practical, affordable innovations such as acoustic tags and robotic tool.

Fishers called for a shift from blame to recognition of their role as “Guardians of the Sea”, supported by stronger systems and institutions.

👉 [To read the full report on the workshops](#)



* From workshops with small-scale and large-scale fishers in Croatia, Italy, Malta, Spain, and Portugal.

FULL REPORT AT:



What fishers pull up in nets*



* From workshops with small-scale and large-scale fishers in Croatia, Italy, Malta, Spain, and Portugal.

FULL REPORT AT:



Engaging younger audiences through video games

Guardians of the Sea

- 3 video games to raise awareness about marine litter and ecosystems.
- A didactic guide with materials for schools to bring ocean conservation to the classroom
-  [Link](#)



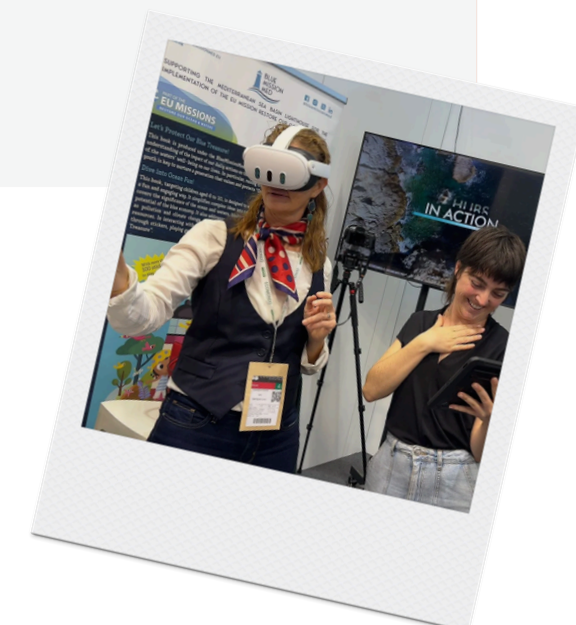
Immersive virtual reality experience

Three scenarios showing how marine litter impacts fishing:

- **Current situation:** existing marine litter and lost gear already impacting seabed and fish stocks.
- **Business-as-usual:** worsening environmental and economic impacts if no action is taken.
- **Improved future:** NETTAG+ solutions (e.g. acoustic tags, better waste management) help restore ecosystems

These scenarios help evaluate social acceptance of marine litter, shape effective incentive schemes and guide future fisheries policies from local to EU level.

 [Watch the 3D video](#)



PREVENT

From awareness to action



Clean ocean days

Clean Ocean Days quantified the marine litter unintentionally collected by fishing gear and the waste generated by fishing vessels during routine operations, demonstrating the important role of fishers as "cleaners and guardians of the ocean."



Litter management

NETTAG+ promotes better litter management practices on board fishing vessels and in ports. Training and recommendations help improve waste collection, sorting, recycling and disposal systems.

Fisher Reward Programmes

Pilot reward schemes encourage fishers to bring ashore marine litter caught during fishing activities. By recognising and incentivising these efforts, the programmes support long-term behavioural change and cleaner seas.

AVOID

Technological solutions: MyGearTag

Under this pillar, NETTAG+ developed MyGearTag, a low-cost, scalable solution that enables immediate localisation and recovery of lost gear through smart-tag technology.



100% ready for commercialisation
100% made from recycled fishing gear.



Reliable identification and localisation of lost gear within a radius of at least 2 kms.



Designed for ease of use by fishers via a smartphone or tablet app: no specialised training required.



Beyond gear recovery, the technology is being tested and help fishers avoid accidental interactions.



Tested in harsh, real-world conditions in the Mediterranean, Adriatic, Atlantic Iberian Coast and North Sea



Watch the testing in Sicily

[Find out more about MyGearTag](#)

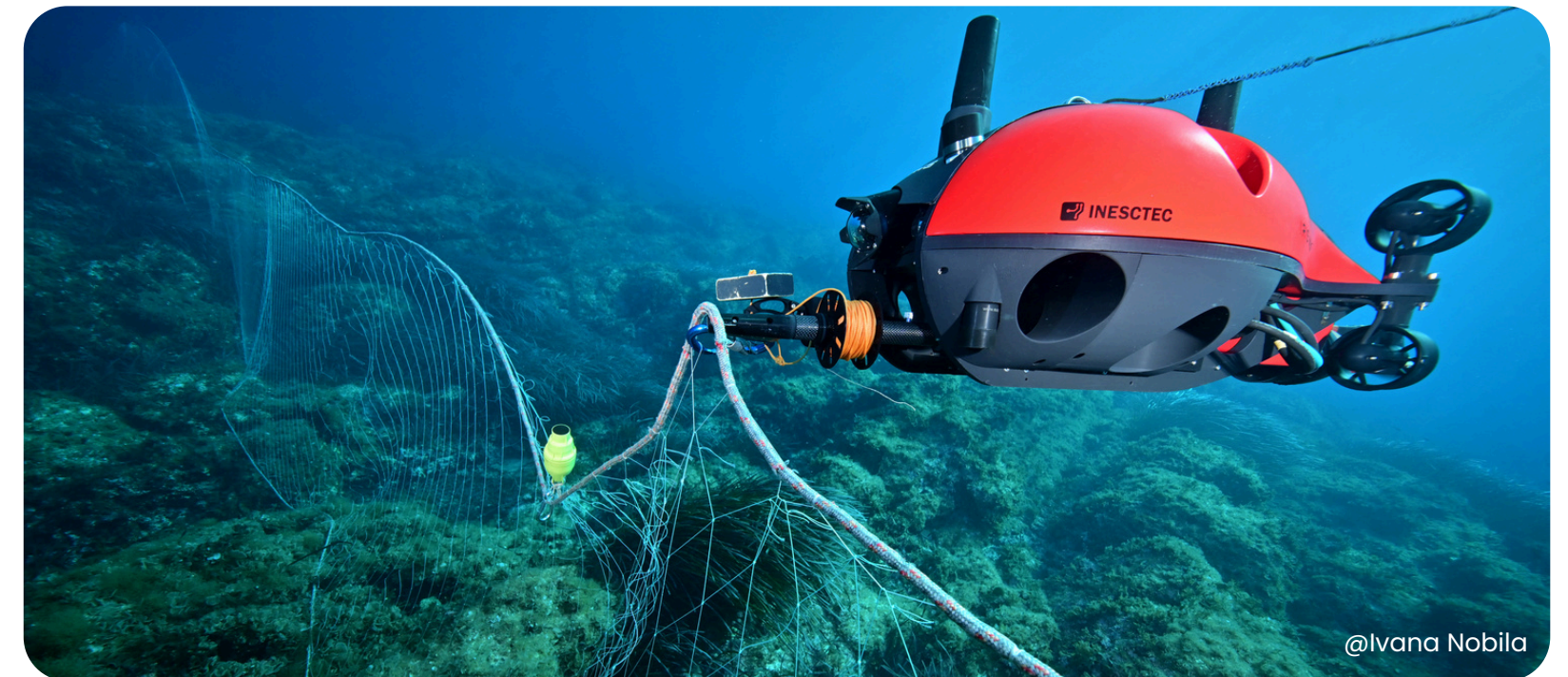
AVOID

Technological solutions: IRIS robotic recovery system



Under this pillar, NETTAG+ developed IRIS, an automated solution capable of locating tagged fishing gear and assisting in its recovery, particularly in situations where conventional retrieval is not feasible

- Autonomous underwater vehicle that can operate either in autonomous mode (AUV) or in remotely operated mode (ROV).
- Designed for coastal operations, offering advanced control manoeuvres, real-time video imaging (ROV mode), acoustic tag detection, imaging sonar and the ability to integrate multiple payloads.
- Compact, lightweight and highly portable design facilitates deployment and underwater manoeuvrability.
- Enables the localisation of tagged fishing gear and inspection of surrounding conditions before recovery operations.
- Intended to support gear recovery in challenging environments or when recovery exceeds the operational capabilities of fishers.
- Designed to be operated by port authorities and other authorised organisations.



Watch the testing in Croatia

MITIGATE

Mapping the unseen

Technological solutions

Under this pillar, NETTAG+ tackled legacy ALDFG through autonomous mapping in the water column and at the seabed. This innovative system integrates high-resolution sonar imaging systems and AI processing algorithms to detect, map and track ALDFG.



How it works

Uses underwater acoustic sensors to capture high-resolution sonar images of the seabed and the water column.

Processes sonar data using machine-learning algorithms to identify acoustic signatures associated with marine litter and lost or abandoned fishing gear.

Systems improve over time using large **datasets** to distinguish gear from the seafloor.

Combines advanced sensing technologies, artificial intelligence and autonomous robotic operations for underwater surveys.

Enables the detection, mapping and tracking of ALDFG on the seabed and throughout the water column.

Data supports authorities in targeting clean-up actions and informing policy.



What reaches ports: 5 key waste streams

Different streams require different handling capacity



Fishing gear & equipment



Passively fished waste



Fishing-activity plastics



Recyclables



Hazardous waste



[!\[\]\(99f58673407353e96a019fbca558fd72_img.jpg\) Read the full report on waste management in European fishing ports](#)

Overview

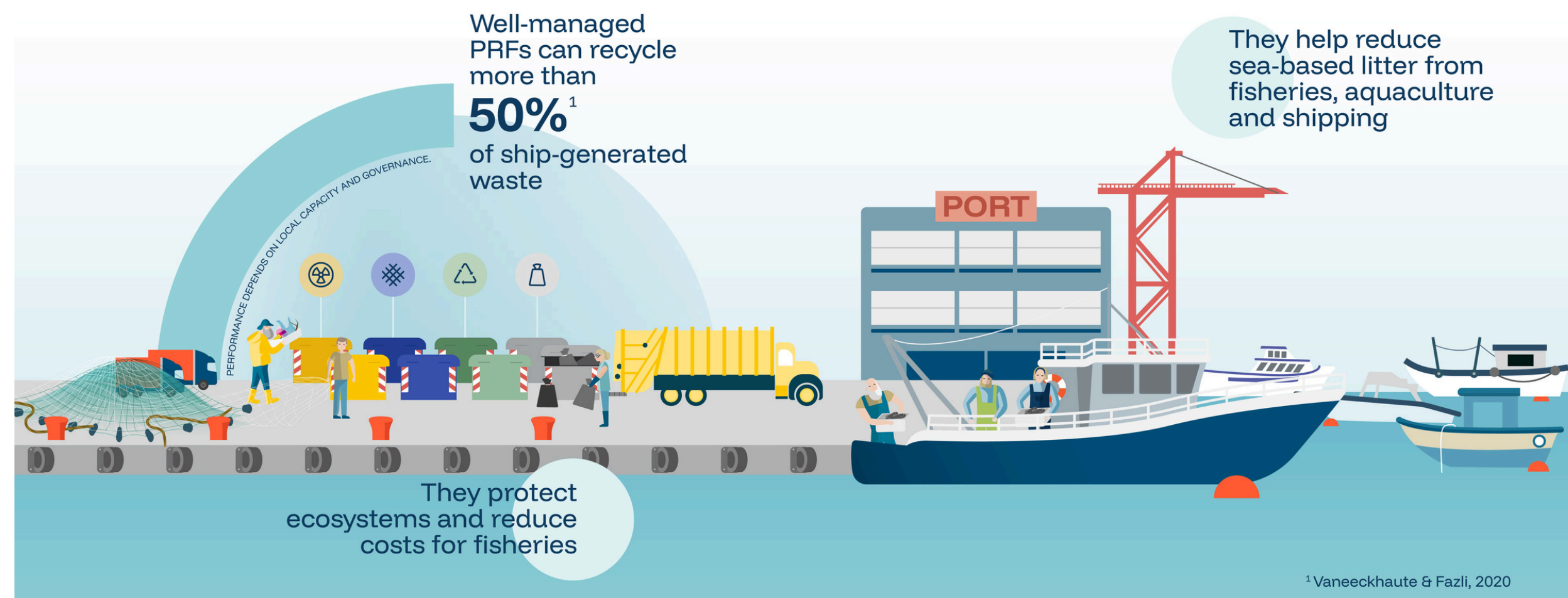
NETTAG + analysed waste and marine litter management practices and needs in both large and small ports and provided recommendations.

Recommendations

- Streamline regulatory framework
- Enhance economic viability
- Promote partnerships and knowledge sharing
- Support adequate infrastructure development
- Improve monitoring and data collection
- Provide incentives and support for fishers

Port Reception Facilities: why they matter

The port system that can prevent leakage



[!\[\]\(f1c5da15572e3e09d343161be98f508d_img.jpg\) Read the policy brief on : Litter management plans and facilities at ports](#)

SCIENCE & POLICY

Waste management

Large ports vs Small ports

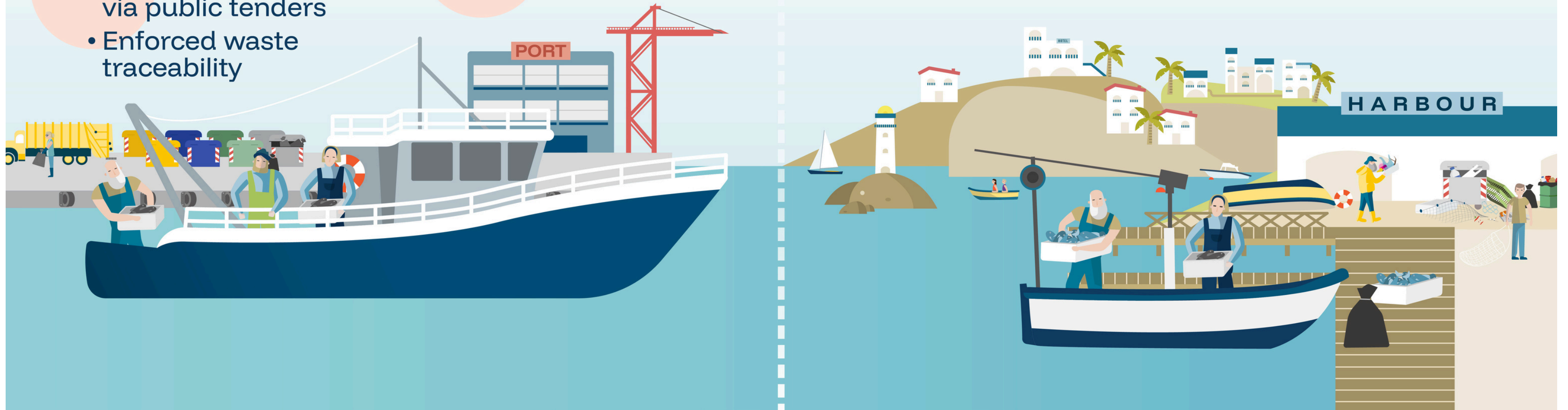
- Waste is managed by port authorities
- Experienced in legislative requirements
- More effective waste management policies

- Waste management companies contracted via public tenders
- Enforced waste traceability

More complete waste policies and procedures

- More fragmented responsibilities
- Limited waste management capacity

- Rely on municipal waste collection systems
- Low resources for innovation



The turning point: Managed vs Unmanaged*



SCIENCE & POLICY

Solutions package



**Stakeholder
collaboration**



**Port infrastructure
upgrades**



**Stronger regulation +
funding**



**Better processing
capacity**



**Incentives &
rewards for fishers**



**Clear
responsibilities**



**Information
campaigns**



USEFUL RESOURCES



Scientific publications

[Acoustic Imaging Learning-Based Approaches for Marine Litter Detection and Classification](#)

[Learning-Based Online Tracking Algorithms for Marine Litter in Multibeam Water Column Images](#)

[Forward-Looking Multibeam - Marine Litter Detection and Tracking Dataset \(FLM-MLDT\)](#)

[Multibeam Multi-Frequency Characterization of Water Column Litter](#)

[Multibeam Acoustic Image based Detection and Tracking of Marine Litter in the Water Column](#)

[Potential of fishing nets for adsorption of inorganic \(Cu and Pb\) and organic \(PAHs\) pollutants](#)

[An Integrated Approach to Assessing the Potential of Plastic Fishing Gear to Release Microplastics](#)

[Microbial communities associated with plastic fishing nets: diversity, potentially pathogenic and hydrocarbon degrading bacteria](#)

[Low Energy, Real Time Passive Acoustic Detection of Dolphin Clicks and Whistles](#)

[Challenges and recommendations for marine waste management in European fishing ports](#)

[Smart acoustic tagging and robotic recovery systems for ghost gear pollution](#)

[Policy briefs](#)



NETTAG+ developed three solutions to
PREVENT, AVOID and MITIGATE the harmful
effect of fishing gear



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ciimar



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FISHERIES AND ANIMAL RIGHTS
PARLAMENTARY SECRETARIAT
FOR FISHERIES, AQUACULTURE
AND ANIMAL RIGHTS



SUCCORFISH



The **NETTAG+** is a three-year project funded
by the EU Horizon Europe program, actively
contributing to the EU Mission 'Restore our
ocean and waters by 2030'.