



RE-THINKING Fish Box

Tackling marine pollution from fish boxes

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Overview

The Re-thinking fish box approach

Eco-design study

KPIs and LCA evaluation

Pilot testing and results

Recommendations

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EPS Fish boxes – Current market

- Expanded polystyrene (EPS) is the single-use packaging most widely used to store and transport fresh fish.
- Some 335 000 tonnes/year of EPS are used for this purpose in the EU.
- Around 14,000 tonnes/year of EPS are used in Italy for transporting and storing fresh seafood.



EPS Fish boxes – The issues

- Recycling levels are very low and mismanaged.
- EPS recycling rates per year: 27% recycled and 40% recovered (Waste to Energy), and the rest landfilled.
- Fish EPS boxes, although 100% recyclable, mostly end up in landfills (45-50% in Europe and 55-60% in Spain).
- EPS is among the most common type of waste found on the Mediterranean sea surface and on the Italian coasts.



RE-THINKING Fish Box project - Key elements



Objective

Preventing and reducing plastic leakage into the environment by identifying and testing an alternative solution to the traditional EPS fish box

Key steps

1. Eco-design study and LCA analysis of existing alternative packaging solutions
2. Implementation of the identified alternative solution in small and mid-scale fishery in Italy



RE-THINKING Fish Box project - Stakeholders involved



Research institute: University of Trieste

Eco-design expert: Quota Sette S.r.l.

Packaging companies: Magic Pack Srl,
Assoimballaggi FederlegnoArredo

Local communities: fishers, seafood distributors
and markets, Municipalities

Waste managers and recyclers: Corepla,
Eco+Eco (Gruppo Veritas), Self Srl



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Logics behind the selection:

- **Hygiene and food contact** – international legislation
- **Physical and mechanical resistance**
- Availability or **fast production** on the market

Steps of eco-design:

- Selection of **materials**
- **Availability** of packaging with selected material
- Identification of **KPIs**
- Evaluation of KPIs, including **LCA**

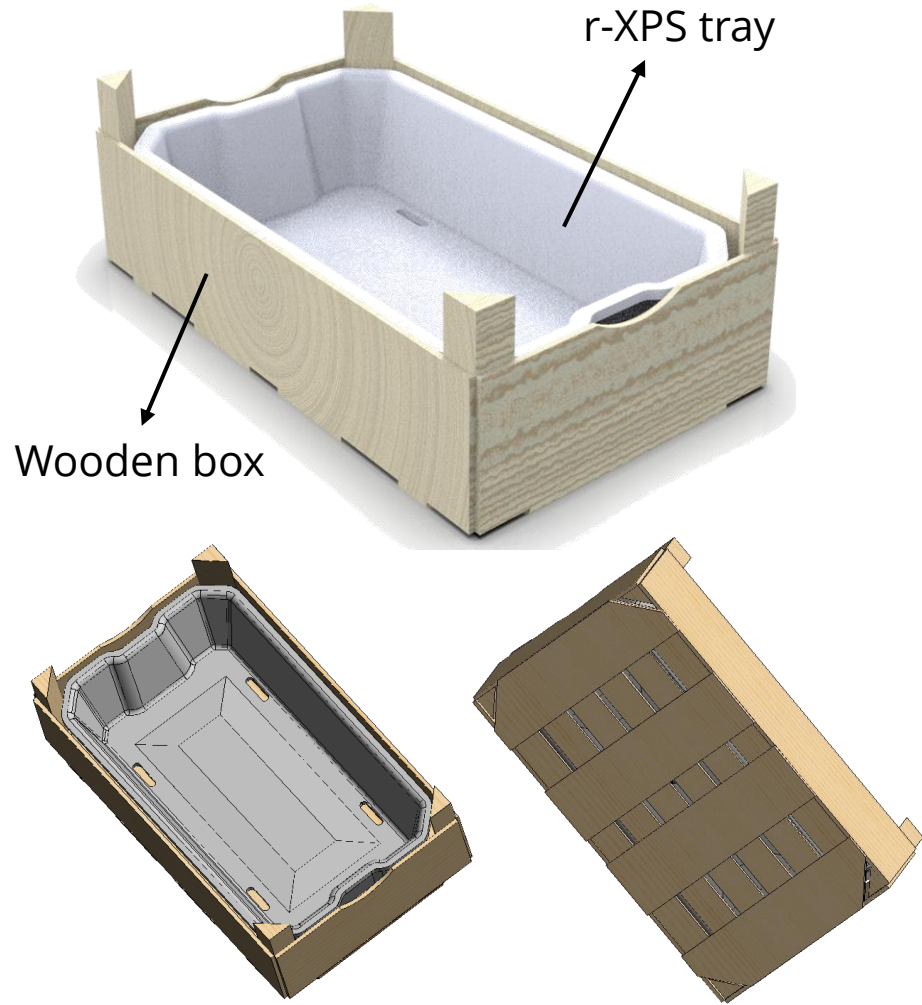


Why XPS was considered as one of the polymers to be used?

OPEN LOOP RECYCLING: from 2022 in Italy, Pro Food, Unionplast, Versalis and Corepla have collaborated to produce the **first extruded polystyrene tray** with **post-consumer recycled material**

- **CLOSE LOOP RECYCLING:** in 2023, Happy Group and MagicPack have been collaborating with a major company in the poultry sector to produce the **first extruded polystyrene tray** with **closed-loop recycled material** in accordance with Regulation (EU) 2022/1616

Best overall performance packaging

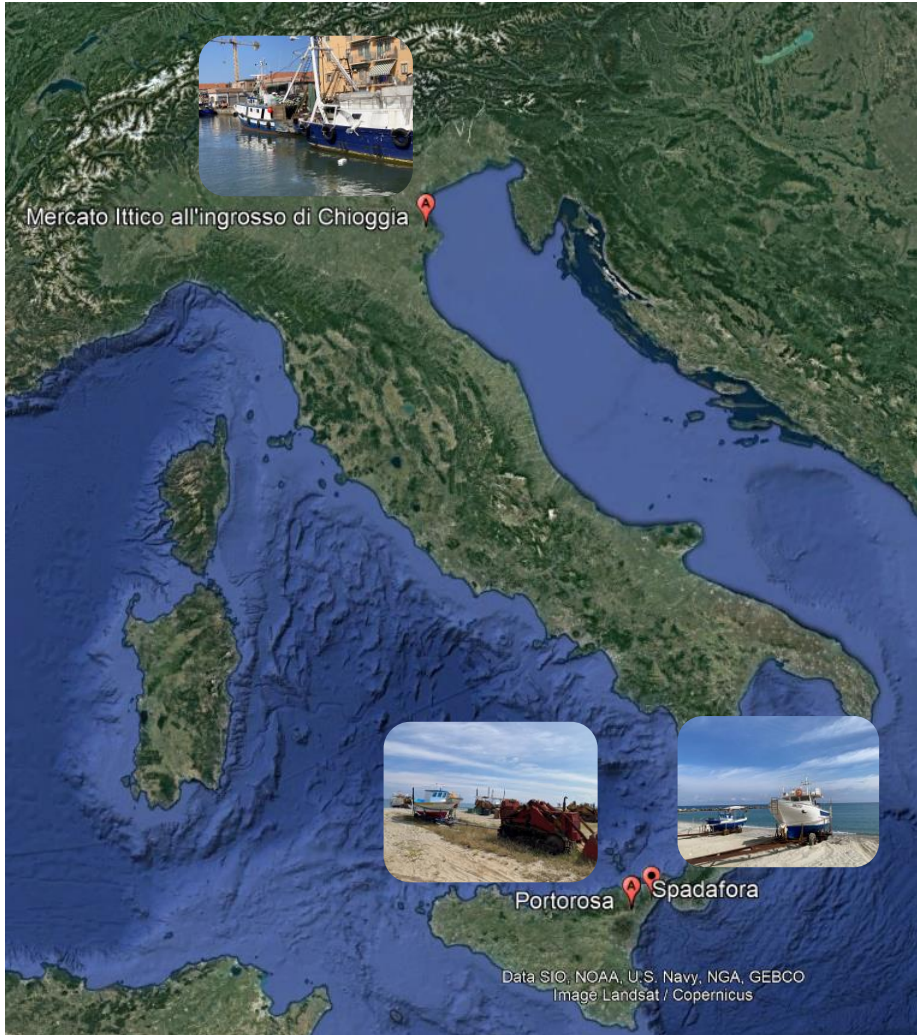


Comparing alternatives – LCA study



KPIs ↓	ALTERNATIVES AND ACTIONS				
	SINGLE-USE IN RECYCLED EPS	SINGLE-USE IN CORRUGATED CARDBOARD	SINGLE-USE IN COMPOSTABLE BIOPLASTIC	REUSABLE IN VIRGIN PLASTIC	REUSABLE WOOD + SINGLE-USE RECYCLED AND RECYCLABLE XPS
Structural qualities	●	●	●	●	●
Thermal qualities	●	●	●	●	●
Practicality of use	●	●	●	●	●
Ease of sanitisation	●	●	●	●	●
Ease of end-of-life management	●	●	●	●	●
Plastic dispersion	●	●	●	●	●
Environmental impacts assessed by LCA	●	●	N.A.	●	●
Cost	●	●	●	●	●

RE-THINKING Fish Box project - Pilot testing



Timeframe

From June to September 2023

Where

Chioggia (Veneto)

Portorosa & Spadafora (Sicily)

Monitoring and capitalization

1. Technical and practical evaluation of the new boxes
2. Scale-up feasibility of the zero-waste system

RE-THINKING Fish Box project - Pilot testing



User feedback



- 2 components for separate functions: wood for transport + XPS for hygiene & thermal need
- Good resistance of wooden box to sunlight, water, salt and mechanical stress
- Higher resistance of XPS tray to fragmentation – in comparison to EPS



- Heavy weight of the wooden box
- Limited capacity, esp. seafood
- Logistics management of 2 components
- Higher Cost



Guiding principles for zero-waste fisheries



- **SCIENCE-BASED:** The guiding principle of innovation and sustainability for developing new solutions must be derived from scientific studies based on the LCA, an eco-innovation tool to implement strategic choices to improve the environmental impacts of a product through a complete view of its life cycle.
- **NOT ONE FIT FOR ALL SOLUTION:** it is not possible to identify a single solution that can suit all contexts and all types of fishery (small, medium and industrial) and which satisfies all priorities.
- **RISK REDUCTION APPROACH** - The solutions implemented must eliminate the risk of EPS-derived pollution, increasing – where possible – re-use and guaranteeing closed-loop recycling, thus preserving the packaging value chain.



Key priorities & recommendations



INNOVATION - More investment in research to increase the availability of recycled materials suitable for food contact;

FINANCE - Apply economic incentive policies that help fishers - especially SSF - procure boxes and equipment allowing their re-use, in compliance with health and hygiene regulations;

LEGAL FRAMEWORKS - Move towards the simplification and harmonisation of legislation concerning food safety and waste disposal;

COLLABORATION - Enhanced collaboration among various supply chain stakeholders so as to highlight their reciprocal strengths and explore the best solutions;

KNOWLEDGE SHARING - Increased coordination among the various projects aimed at addressing the problem of marine litter tied to fish boxes as well as the identification of possible synergies.



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**We must continue to think
outside the box to help
reduce and prevent plastic
leakage into the
environment.**

#NoPlasticInNature