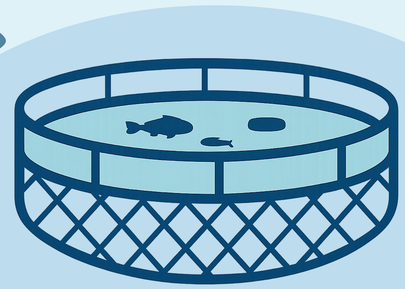

MonoNet

Closing the loop, one net at a time

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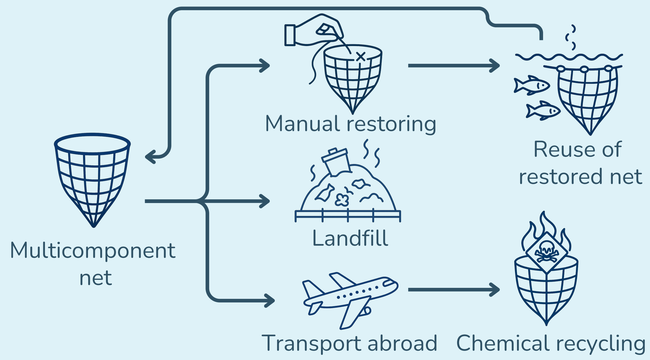
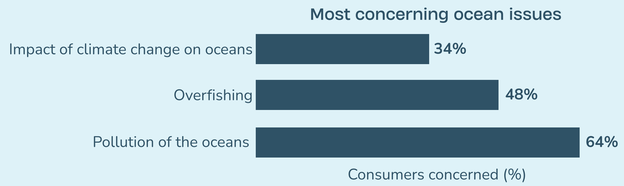
Why?

After a fishing cycle, the net is removed from the sea, inspected, and cleaned. If it's repairable, manual labour is required to restore it before the next season. If too damaged, the net is sent abroad for chemical recycling or to a landfill. This is necessary due to its complex material composition, which makes mechanical recycling impossible due to differing melting points. The process is both time-consuming and costly.



The business case for closed loop fisheries

In 2024, European seafood consumers rated **Pollution of the oceans (64%)** as the single-most concerning ocean issue. This was even higher than **Overfishing (48%)**. This means that the reduction of pollutants arising from fishing may be the most convincing step companies and industry bodies can take to market seafood products as ecologically friendly.



Not only is ocean pollution a leading concern, but in 2022, **48%** of European consumers were **willing to pay more** for products that **support society or the environment**. This rose to **57%** of European seafood consumers who were prepared to pay more for **seafood from a certified sustainable fishery**. This presents real sales opportunities for businesses ready to invest in reducing plastic waste.

National and European regulators are increasingly responsive to the need to protect our oceans and reduce waste, and global trading conditions are increasingly volatile. Investing in closed loop materials and processes today can prepare for the legal and economic challenges of tomorrow.

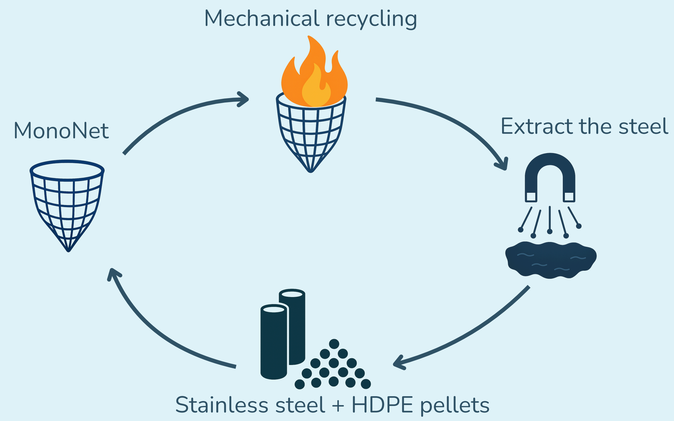
Solution

Comparison of material components in a typical existing net design versus our MonoNet design:

Multicomponent net	MonoNet
• Polypropylene (PP) • HDPE • Nylon • Lead • Other materials	• HDPE • Stainless steel

Advantages and disadvantages of HDPE as a monomaterial for nets:

Advantages	Disadvantages
• Viscoelastic material with high elongation capacity • Very low water absorption at saturation • Good strength • Good resistance to UV	• Lower density than water, requiring additional material for sinking



Stainless Steel (316L): The Sustainable Solution for Sinkable HDPE Ropes

Replacing lead with stainless steel (316L) in sinkable HDPE ropes offers significant **environmental and recycling benefits**. **Lead is toxic** and hard to separate in recycling, while stainless steel (316L) is non-toxic, durable, and easily recyclable.

The **separation is simple**: HDPE melts at 131.8°C, **leaving stainless steel (316L) solid for easy removal**. This shift improves recycling efficiency and reduces environmental impact, enhancing sustainability in aquaculture.

Recyclability and circular economy potential

Most of the HDPE from end-of-life nets can be reprocessed into **pellets**

BUT...

Creating new nets entirely from recycled HDPE pellets is currently **limited** by **impurities** in the material.

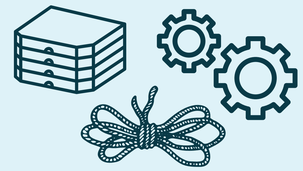
Current research and oportunities

Blending recycled HDPE with **virgin pellets** shows potential to enhance the properties of the recycled HDPE.

Explore new approaches to **reduce marine debris contamination** during nets collection and processing

Need for further development

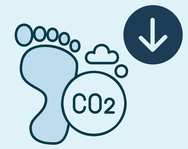
Instead of nets, current applications of the resulting pellets can be the creation of:



Ecological impact

Lower carbon footprint

Using **recycled HDPE** instead of virgin plastic cuts greenhouse gas emissions by up to **50%**, thanks to its low **Global Warming Potential of 8.65 kg CO_2 per kilogram/ton HDPE.**



Less marine pollution

HDPE nets are less likely to fragment and generate microplastics over their lifetime.

Waste Reduction

Mechanical recycling of HDPE helps divert plastic waste from landfill sites. Recycling one tonne of this material results in a landfill volume reduction of approximately 1.9 m^3