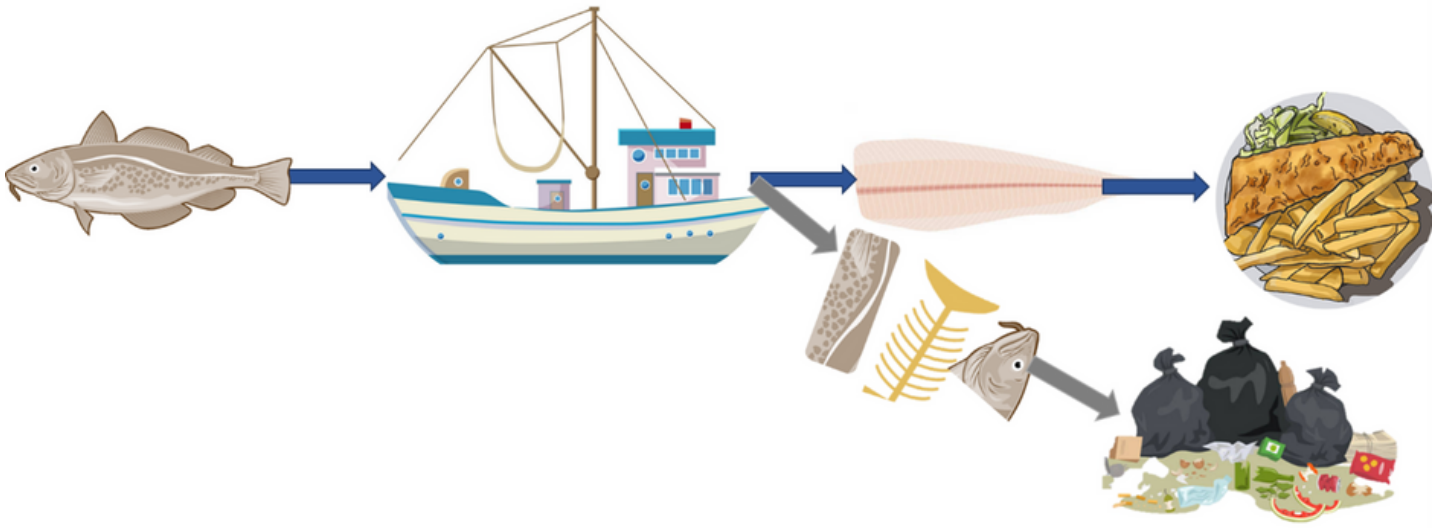
# Seafood in the circular economy

Circular economies are those that close the loop between production and consumption. They design the waste out of the system, and regenerate the production process. On a planet where global population is predicted to reach 10 billion people by the year 2050, it is essential that the products and materials we use, retain their value for as long as possible and that we minimise the generation of waste. This will both support resource security and help to protect our planetary health for future generations. Yet, we are currently far from this target, in 2021, 931 million metric tonnes of food produced was wasted, and much of this waste goes to landfill, where, as it breaks down, it produces greenhouse gases and further exacerbates climate change. In the United Kingdom, if organic food waste was saved from landfill, this would save 1.1 billion USD in landfill cost and reduce carbon emissions by 7.4 million tonnes.

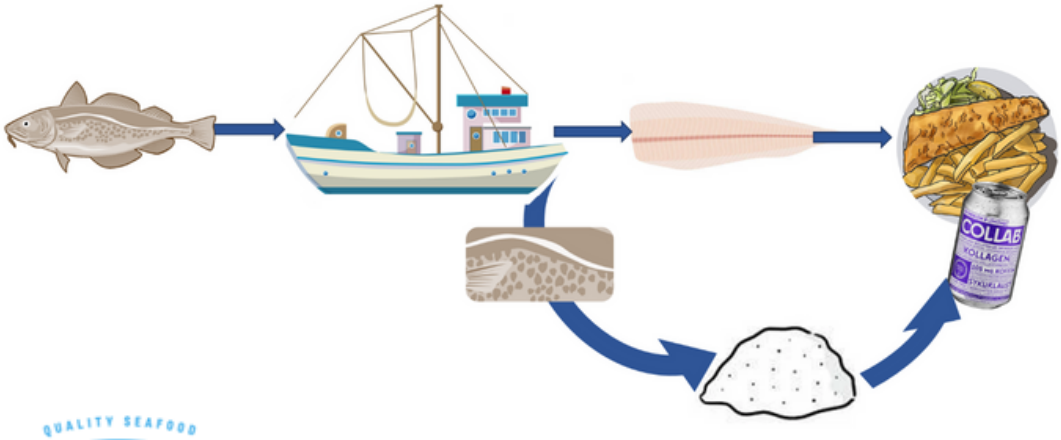
Seafood consumption is rising and according to FAO, 179 million tonnes of fish were produced globally in 2018. From this huge production volume, only a small proportion is actually consumed. It is estimated that 35% of the global harvest is lost or wasted every year, ending up in landfill and contributing to greenhouse gas production. For example, a cod fillet is around 35-45% of the weight of the fish, yet traditionally this is often the only part of the fish that has been marketed and consumed, leaving behind as much as 65% of each fish. Likewise for salmon, around 42% of each fish is traditionally considered a waste product that frequently ends up in landfills. This is an inefficient and unsustainable way to use our seafood resources.



Applying circular economic thinking to our fishery and aquaculture products gives us the opportunity to mimic a more natural system to regenerate "waste" into new and valuable products and side streams. This is not only beneficial for the environment, but also for the economy. There is much discussion in policy and academic research about the potential and importance of circular economies, but there has often been a gap between the idea and the implementation.

In Iceland, the Iceland Ocean Cluster has been bridging this gap. The cluster has used its network of knowledgeable actors and industry to seek solutions for minimising waste streams. The matchmaking role of the cluster has led to successful projects in the circular economy. One such is the re-imaging of the Atlantic cod skin into a new resource which has been championed by multiple companies. Marine Collagen, which was initiated within the cluster, has extracted collagen, a structural protein that is responsible for healthy joints and skin elasticity.

Feel Iceland, which utilises fish skin collagen to develop health products in collaboration with researchers and investors close to the IOC. Codland, which works with both fisheries and researchers, led by the IOC, has resulted in an initiative focused on fish skin and omega-3 rich fish oil. The newest collaboration is a collagen rich drink produced by Collab which is now the most popular energy drink in Iceland, providing unique nutritional value and creating a new valuable side stream from fisheries by products.





With extensive collaboration, the parts of Atlantic cod in Iceland that were previously lost have now been saved, and up to 90% utilisation of each fish has been achieved through circular economy approaches. It is now necessary to move toward the total utilisation of our valuable seafood resources. To meet this target, the Iceland Ocean Cluster created 100% Fish, a global project that aims to design-out the waste from our seafood supply chain. Companies, like Marine Collagen, have raised the bar for how we can gain so much value from Atlantic Cod side streams.

There is now huge opportunity to create new value and form regenerative production cycles from a wide range of seafood that is currently wasted both from fisheries and aquaculture. The Iceland Ocean Cluster has a 5-step strategy that we use to successfully develop new value creation. The strategy starts with the emergence of a good idea, a business plan and working group are then built around this good idea, bringing together cluster members with the expertise to support and develop this idea. At this stage, initial financial commitment is required, and the creation of a strong business plan by a now more formal enterprise. Lastly, the owners and team become established and prepare to carry their enterprise forward.

The Ocean Cluster Network, a network of global ocean clusters established by the Icelandic Ocean Cluster can support the collaboration, technology and knowledge transfer necessary to change the narrative around "waste" and maximise the value of seafood.

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