



Norwegian Embassy
Madrid



Innovation
Norway

NORWEGIAN
SEAFOOD COUNCIL

Sustainability - From Ocean to Plate



Norway

¿Estamos preparados?



Norwegian Embassy
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SEAFOOD COUNCIL



Norway



Let's explore together

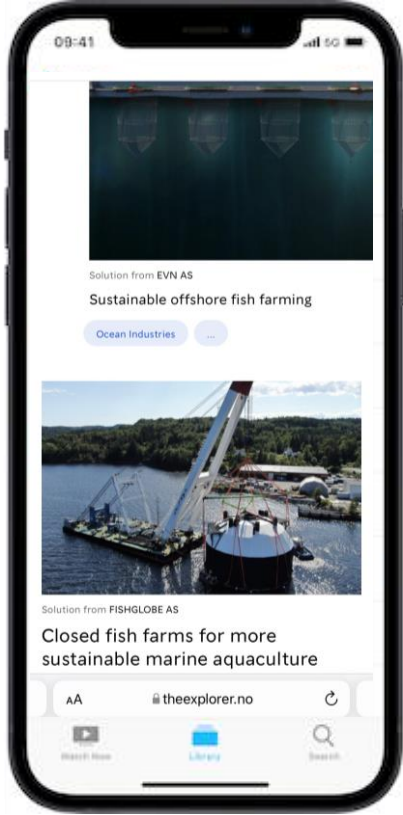
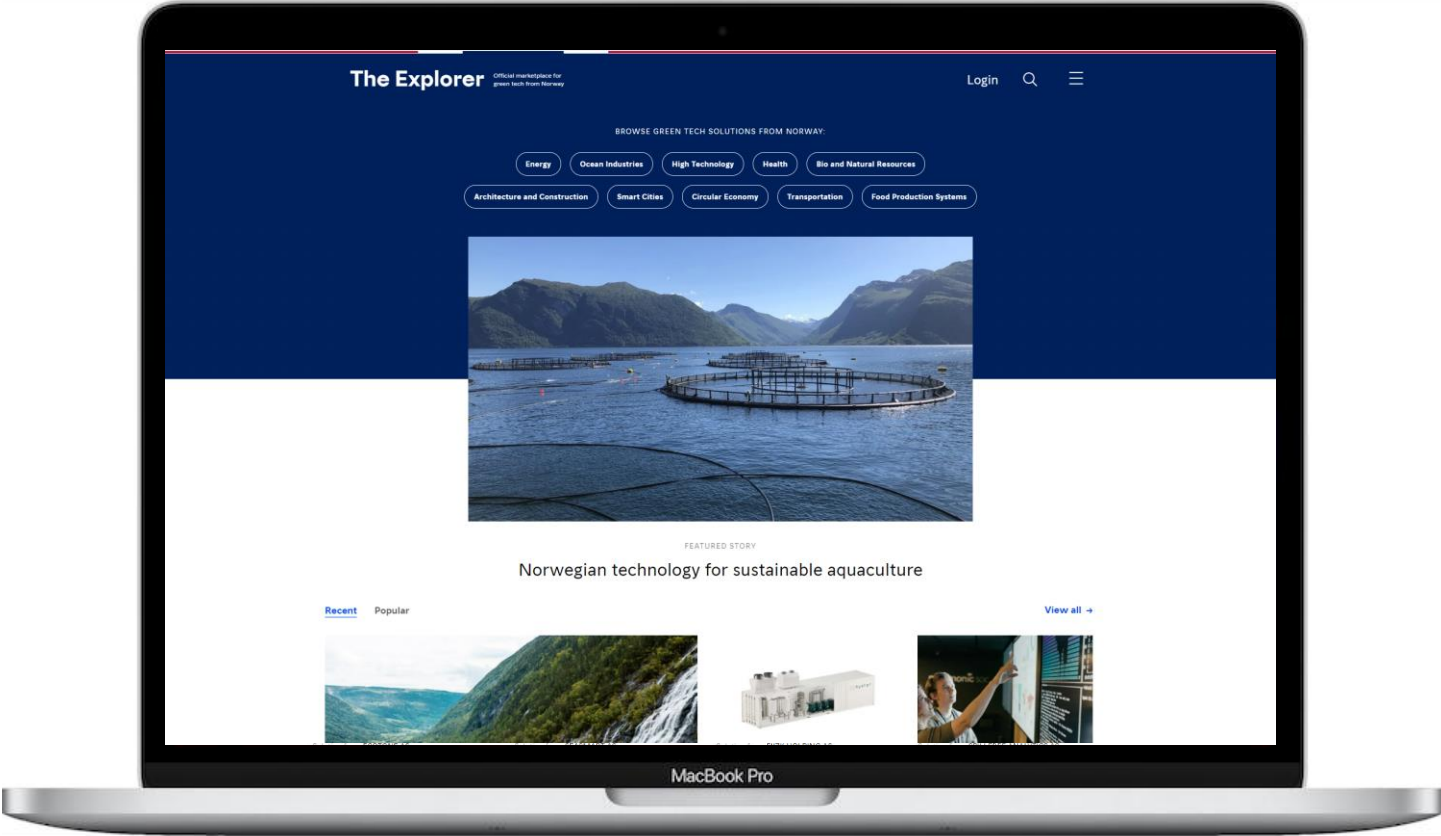
Helene Friis, Innovation Norway

The world is asking for **green** and **sustainable** solutions





The Explorer is Norway's **official platform** showcasing green and sustainable solutions with the goal to **match** international businesses with Norwegian companies



The Explorer

Green and sustainable solutions from Norway

Login  

Searching for aquaculture



Solution from MMC FIRST PROCESS AS

Systems for ensuring gentle and sustainable fish handling

Ocean Industries 



Solution from URCHINOMICS NORDIC AS

Restoring coastal ecosystems by ranching urchins

Ocean Industries 



Solution from C-FEED AS

Turning CO₂ into superior starter feed for aquaculture

Ocean Industries 



Solution from EVN AS

Sustainable offshore fish farming

Ocean Industries 



Solution from FISHGLOBE AS

Closed fish farms for more sustainable marine aquaculture

Ocean Industries 



Solution from FJORD MARITIME AS

Hybrid technology cuts fuel costs, noise and pollution for aquaculture

Energy 



Solution from FJELL TECHNOLOGY GROUP AS

Producing fertiliser from dried wastewater

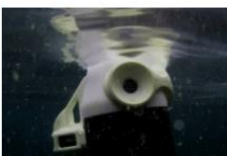
Ocean Industries 



Solution from NAVIAQ AS

Streamlining fish farm maintenance with all-in-one software

Ocean Industries 



MacBook Pro

MMC First Process



Systems for ensuring gentle and sustainable fish handling

MMC First Process provides unique system solutions for handling live fish, improving fish welfare and reducing biomass loss in fish farms and pelagic fisheries.



Fish harvested from fish farms and by fishing vessels are put through a long process involving many steps before they are ready to be shipped to customers.

Throughout this process, fish are vulnerable to stress, disease and damage. It is estimated that fish farms and wild-catch fisheries can lose a large portion of their yield due to sub-optimal handling, processing and cooling of fish.

This is not only detrimental to the fish and the environment, but is a waste of nutritious food that is needed to feed a growing global population.

Sustainable fish handling systems

Pooling expertise from onshore, onboard and aquaculture fish handling, [MMC First Process](#) offers complete system solutions for handling and processing live fish. The company's systems provide optimal conditions for fish from the moment they are pulled out of the water until they are ready for filleting or further processing.

MMC First Process systems cover all stages of live fish transfer, transportation and storage and can be tailored to customer needs. The systems incorporate 27 unique solutions to ensure that fish experience gentle handling, minimal stress and optimal water conditions at all times. These include an [energy-efficient fish pump](#), [stress-free waiting tanks](#) and a [state-of-the-art water quality monitoring system](#).

All of this ensures good fish welfare and forms the foundation for a high-quality product.

Get in touch



Per Helge Devold
VP Marketing and PR
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Per.Helge.Devold@mmcfp.no →

Contact

Company



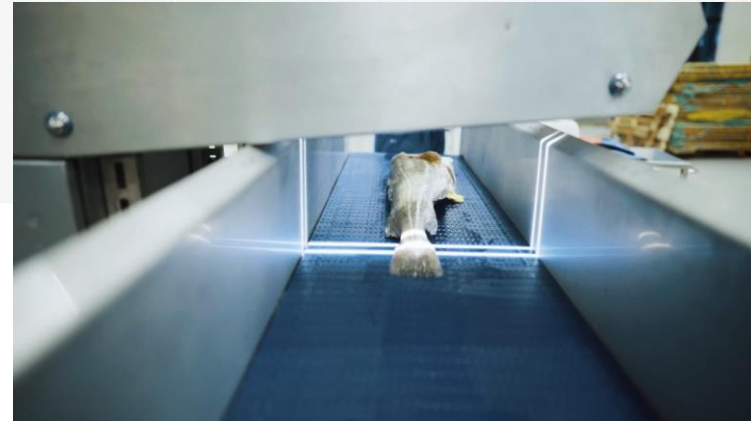
MMC FIRST PROCESS AS
Mjølstadnesvegen 21, 6092 FOSNAVÅG,
Norway
+47 70 08 39 00

mmcfirstprocess.no

Maritech Eye™

Good fish or bad fish? Maritech Eye can automate the answer

Maritech Eye™ provides objective, automated assessment of fish quality at industrial speed. "This is the world's leading industrial solution capable of scanning fish below the surface. It's a game-changing innovation for sustainability in seafood," says Per Alfred Holte, VP Technical Solutions at Maritech.



Sustainable seafood is the most environmentally efficient source of protein on the planet. Under pressure from consumers and governments alike, the seafood industry must continually innovate to increase its sustainability profile.

"The seafood companies that succeed financially in the future will be those that adopt technology to protect the environment," says Gundersen.

Documents the inside of the fish

Maritech Eye™ automates the quality assessment of red and white fish at industrial speed. Using hyperspectral camera technology, it analyses and documents the inside of each fish with higher precision and faster speed than a person.

"Maritech Eye scans below the skin of white fish for quality and identifies blood spots in red fish fillets. White fish is sorted by species as well. Each fish can be given a quality score based on preset algorithms," explains Holte.

The solution quickly detects whether a fish is suitable for a premium product such as fillet loins or for lower-end products such as fishcakes. The information is sent to the grader for sorting as well as to the LINSIGHT IoT platform for data storage and analysis.

Get in touch

Per Alfred Holte
VP Technical Solutions
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[Message](#)

At a glance

- ✓ Objective, automated fish quality assessment
- ✓ Scans white and red fish at industrial speed
- ✓ Increases sustainability and profitability in fish processing

Status

[Available](#)

AMOF-Fjell



AMOF-Fjell fishmeal plant turns trawler waste into profitable fish products

The AMOF-Fjell fishmeal plant converts fish waste to valuable nutritional products on board fishing trawlers. "The world needs more marine protein and nutrients. Our compact plant helps to increase the yield of these much-needed products," says Ørjan Jansen, Project Manager at AMOF-Fjell Process Technology.



One in three fish caught around the world is either dumped overboard or rots before it can be eaten. "Many fishers are throwing away valuable marine resources. They are also losing money and polluting the marine environment that they depend on," says Jansen.

High-quality fishmeal and fish oil

The AMOF-Fjell compact fishmeal processing plant produces fishmeal and fish oil from residual raw materials on fishing trawlers. This includes both fish waste and commercially nonviable fish caught in the trawling process. The products are then sold for various applications.

"Our onboard plant typically processes 50–250 metric tons of fish heads, tails, viscera and offcuts per day. This is substantial capacity for such a compact design like ours," explains Jansen.

When produced on the vessel, the end-products are as fresh as possible. Fish residuals are processed within one to two hours of catch, and bacteria are eliminated with heat.

"High quality matters in the marketplace. Take fish oil, for instance. You could drink it directly from our plant. This shows how clean it is. Then it's sold for further

Get in touch



Ørjan Jansen
Project Manager
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oja@amof-fjell.com →

Message

Company



AMOF - FJELL PROCESS TECHNOLOGY AS

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Norway
56 33 43 00

amof-fjell.com



Sustainable energy source – Aquaculture

Lars Wasa Andersen Segment sales manager (Aquaculture)

Lars.andersen@no.abb.com



57

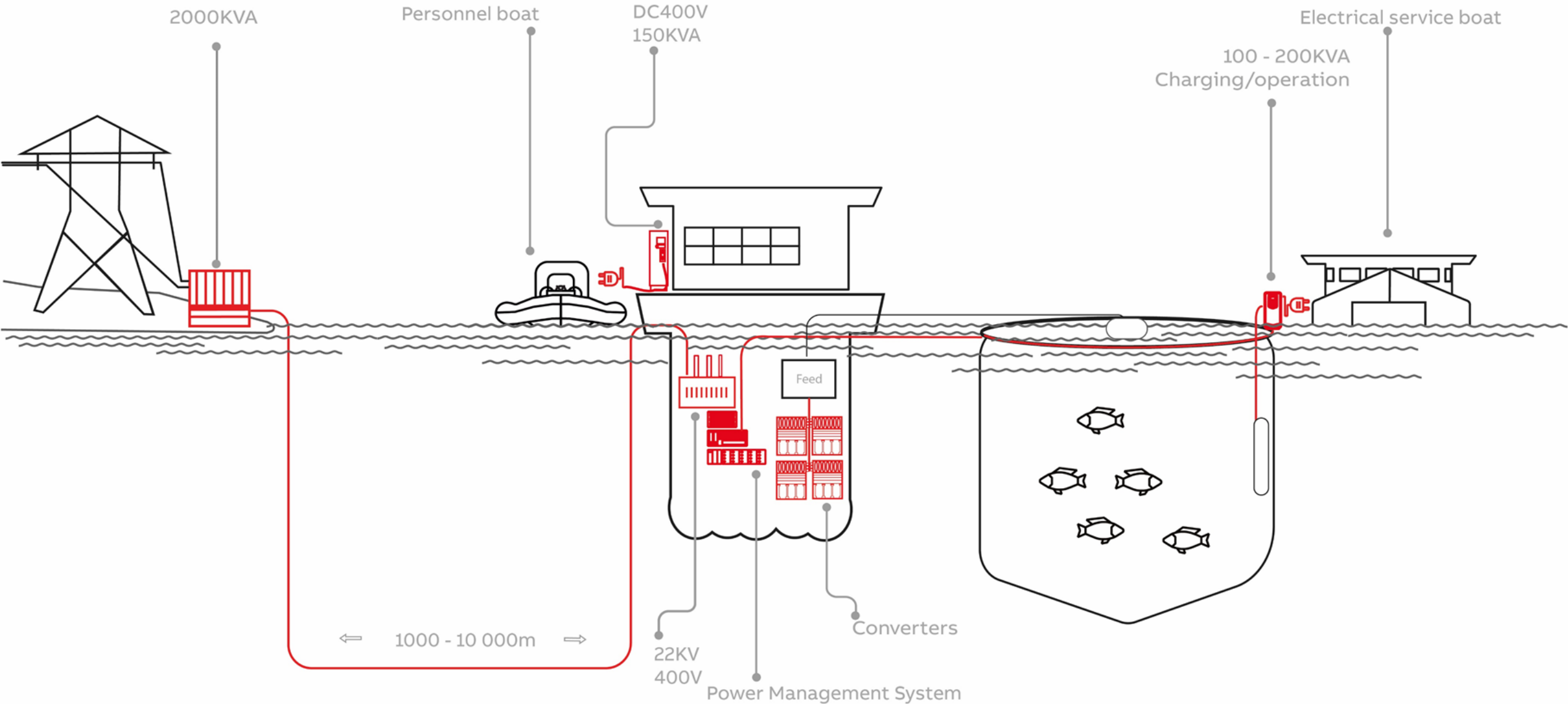
1

571

- Norway has about 1000 fish farms along the coast
- **57%** of all fish farms in Norway have power from shore (Power generated by hydro power)



1



571



Running the World Without Consuming the Earth





AION

Runa Haug Khoury
CEO, AION by Aker BioMarine

Barcelona, 25 April 2022

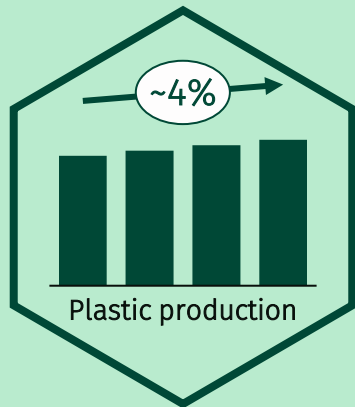


AION

Circular Economy in practice

**How we create value for retail, HORECA and the
seafood industry from ocean industry plastic waste**

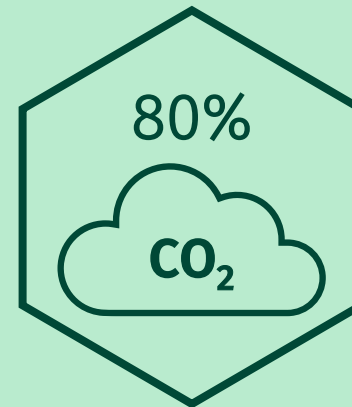
Plastic is a good material – that urgently needs to be used in a circular way!



282 mmT¹ of plastic waste is produced worldwide every year....



...of which only ~15% is recycled...



...and mechanically recycled raw material is 80% less pollutive than virgin...



...making circularity the only viable long-term solution

Note: (1) Million metric tonnes (mmT)
Source: McKinsey Analysis (2021)



**Marine industry has a unique potential
for plastic circularity**

...by turning own waste streams into new circular products in your own value chain

Principal plastic waste streams



Circular Pallets



...or by directing own waste streams into new traceable life in new industries!

Principal plastic waste streams



Circular products within HORECA & retail



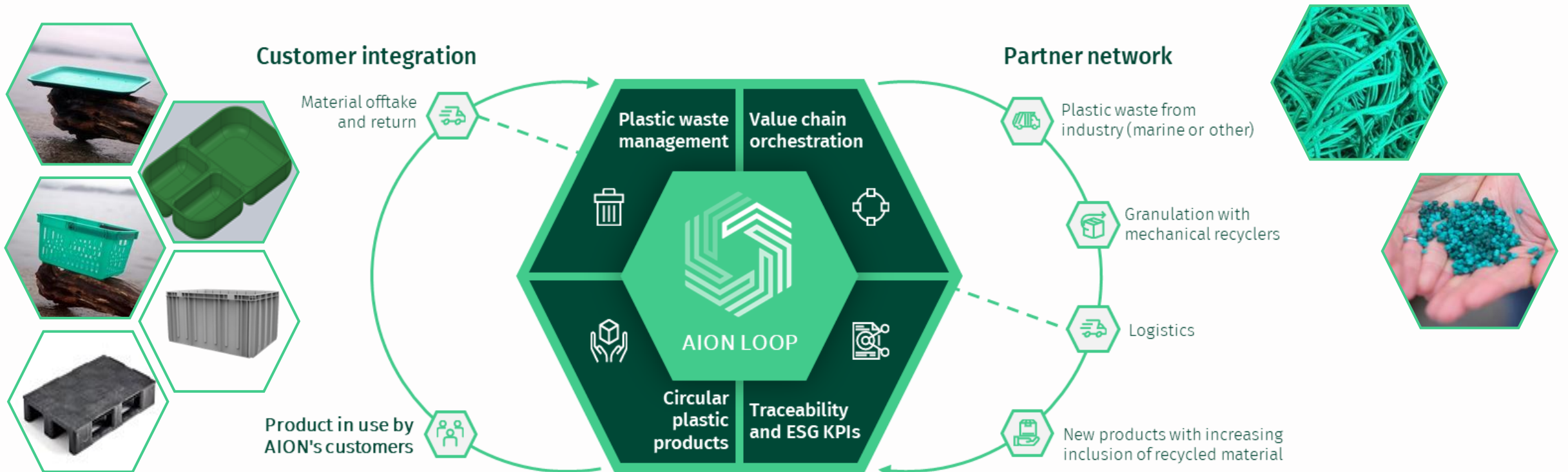


**AION is a Norwegian tech & impact company that pioneers
Circularity As A Service in industrial plastics**

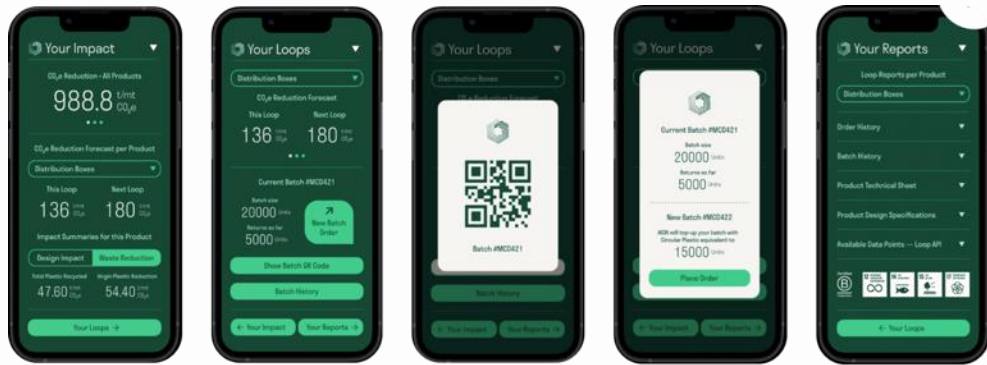


Through AION we will close the tap on industrial plastics by creating **circular closed loops** for our customers

Circularity As A Service (CaaS)



AION LOOP collects and analyzes data to secure traceability, documented environmental effects and circularity insights



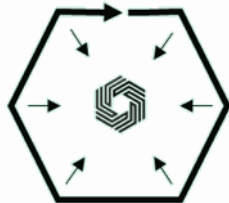
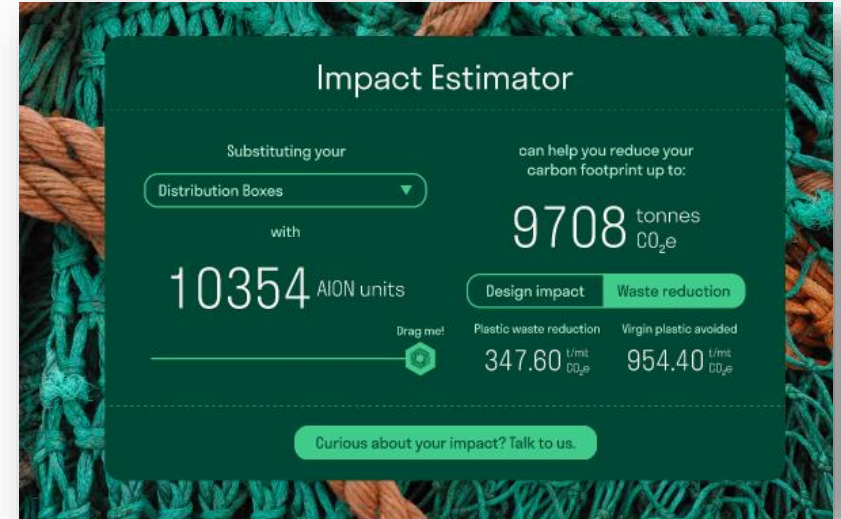
Total effekt oppsummering

Per loop oppsummering

Batch kontroll på site

Ny batch bestilling

Loop rapporter



Traceability



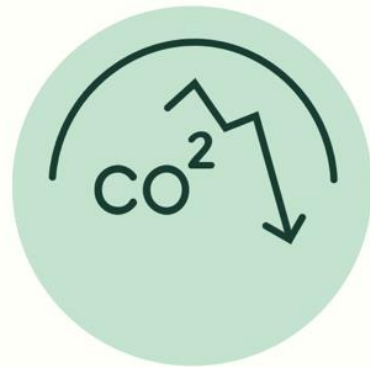
Documented ESG KPIs



Circularity insights

Want to talk about circularity?

hello@aion.eco



Reduced Co2



Less waste



Less plastics



AION

Thank you! 



Blue Food
Assessment

Healthy people, healthy planet: Opportunities and risks for seafood

Building healthy, equitable and sustainable food systems



Credit: Lisheng Chang | Unsplash

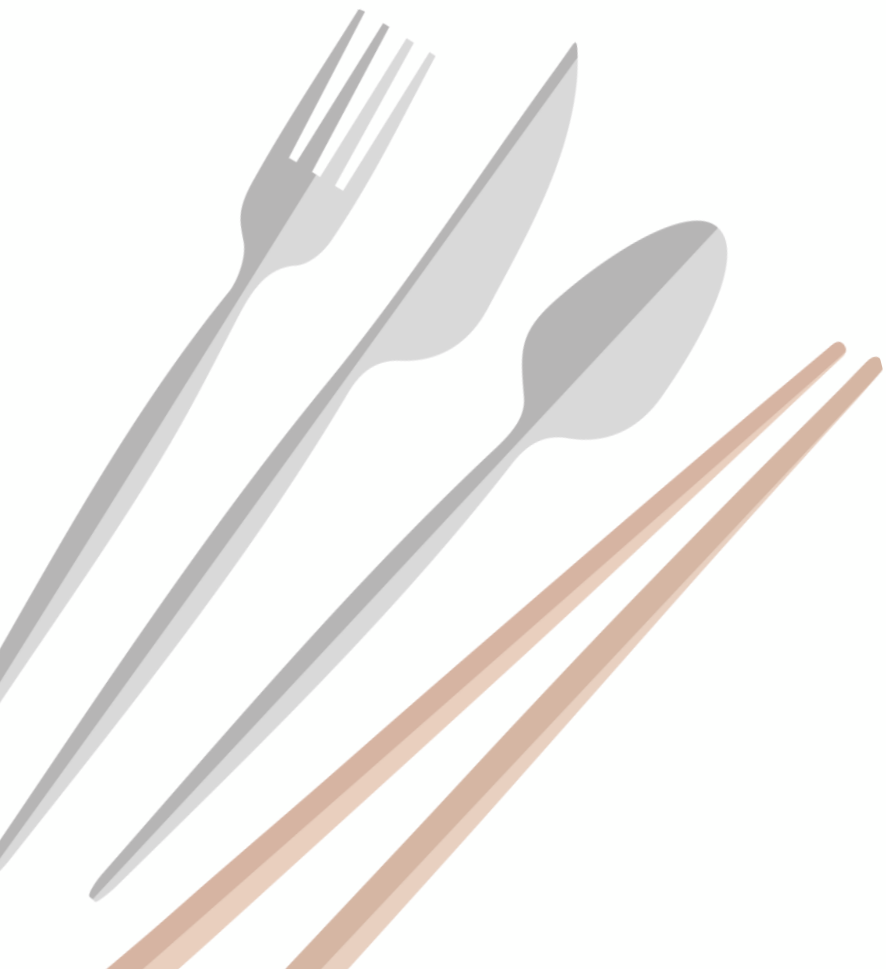
Problems connected to our food systems










- Food production accounts for 3/4 of our use of freshwater, 40% of land and accounts for roughly 25% of the world's greenhouse gases
- Food production is 80% of biodiversity loss
- > Half of world's population struggles to access healthy foods



Target 1 – Healthy Diets

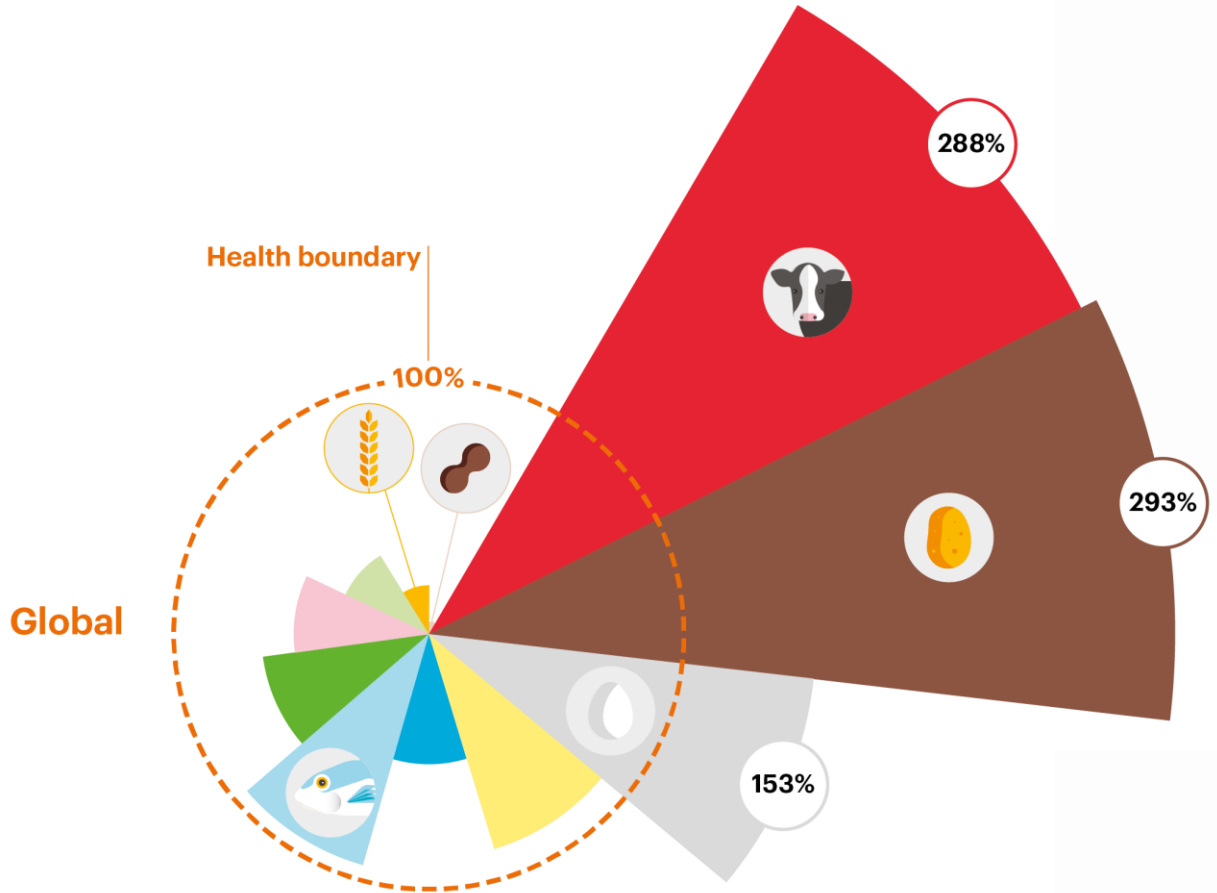
2500 kcal/day









		Macronutrient intake grams per day (possible range)	Caloric intake kcal per day
	Whole grains Rice, wheat, corn and other	232	811
	Tubers or starchy vegetables Potatoes and cassava	50 (0–100)	39
	Vegetables All vegetables	300 (200–600)	78
	Fruits All fruits	200 (100–300)	126
	Dairy foods Whole milk or equivalents	250 (0–500)	153
	Protein sources		
	Beef, lamb and pork	14 (0–28)	30
	Chicken and other poultry	29 (0–58)	62
	Eggs	13 (0–25)	19
	Fish	28 (0–100)	40
		Legumes	75 (0–100)
	Nuts	50 (0–75)	291
	Added fats		
	Unsaturated oils	40 (20–80)	354
	Saturated oils	11.8 (0–11.8)	96
	Added sugars All sugars	31 (0–31)	120

Target 1 – Healthy Diets

2500 kcal/day



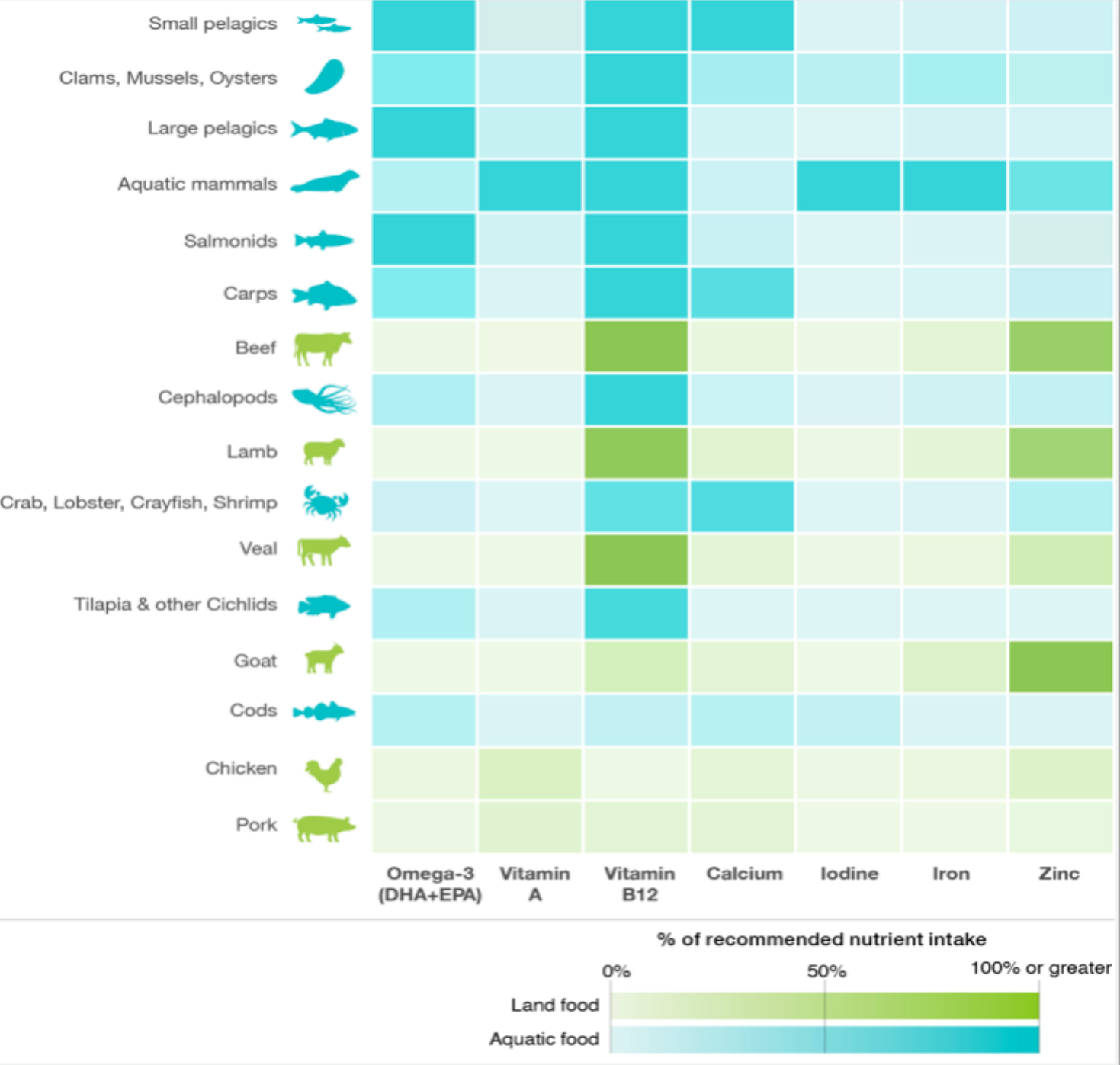
		Macronutrient intake grams per week (possible range)
--	--	--

	Whole grains Rice, wheat, corn and other	232
	Tubers or starchy vegetables Potatoes and cassava	50 (0-100)
	Vegetables All vegetables	300 (200-600)
	Fruits All fruits	200 (100-300)
	Dairy foods Whole milk or equivalents	250 (0-500)
	Protein sources Beef, lamb and pork Chicken and other poultry Eggs Fish	100 (0-200) 210 (0-420) 90 (0-175) + 210 (0-700) <hr/> 610 (0-1500)

	Added fats Unsaturated oils Saturated oils	40 (20-80) 11.8 (0-11.8)
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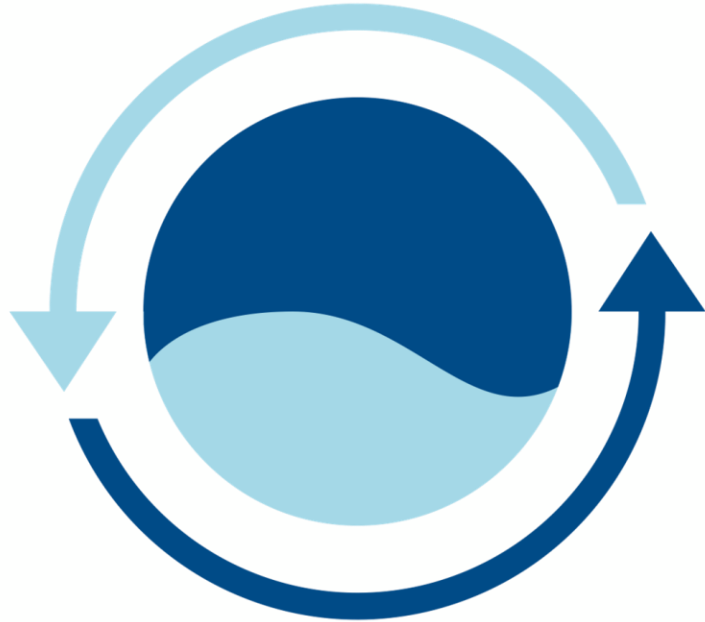
	Added sugars All sugars	31 (0-31)
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Blue foods can support *public health*



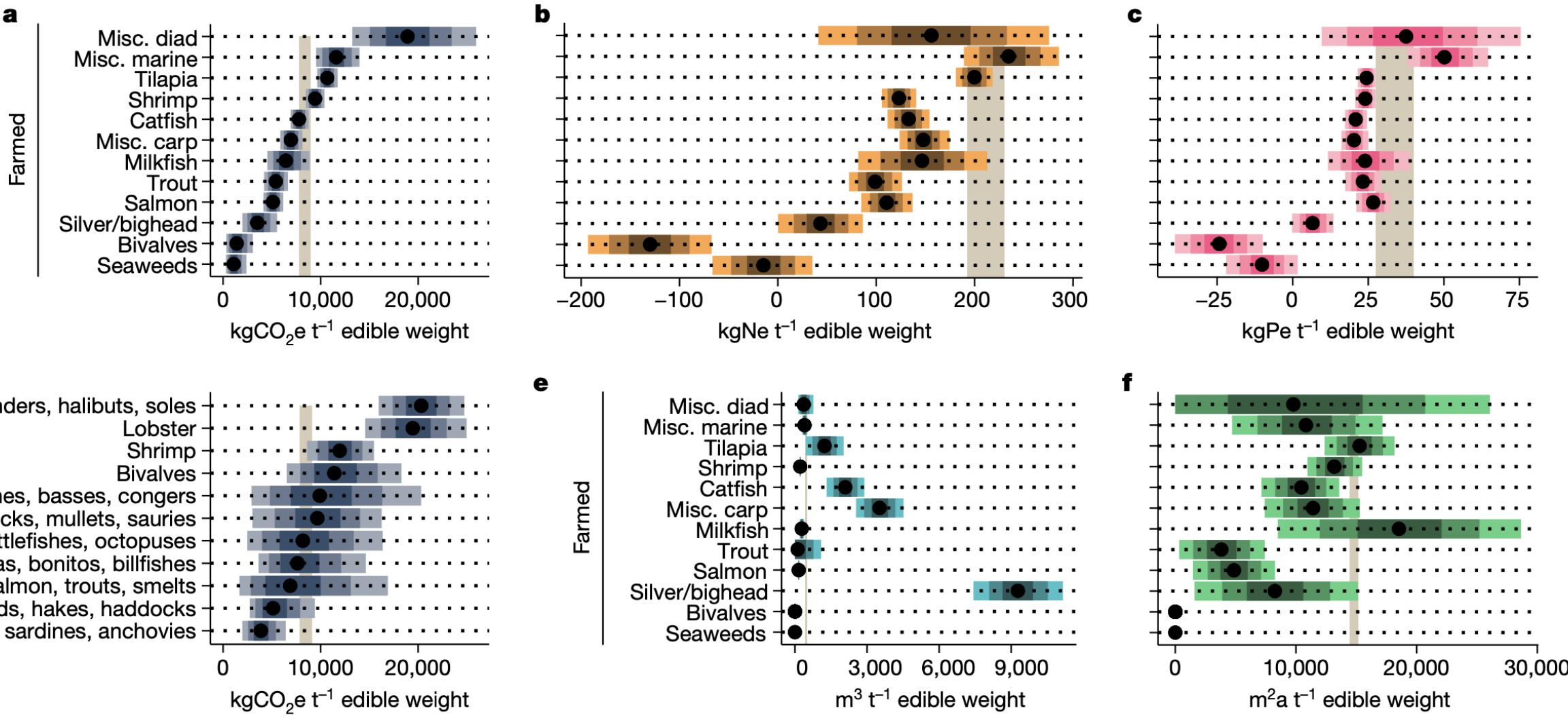
Findings

Blue foods can support *sustainability*



- Assessed 75% of species produced globally
- Farmed bivalves and wild-caught small pelagic fish = lowest greenhouse gases
- Farmed salmon, trout, fed carps, catfish and tilapia perform similarly or better than chicken
- Wild fish to produce a kilogram of farmed fish declined by 85%
- 50% less land/water use with increased yield

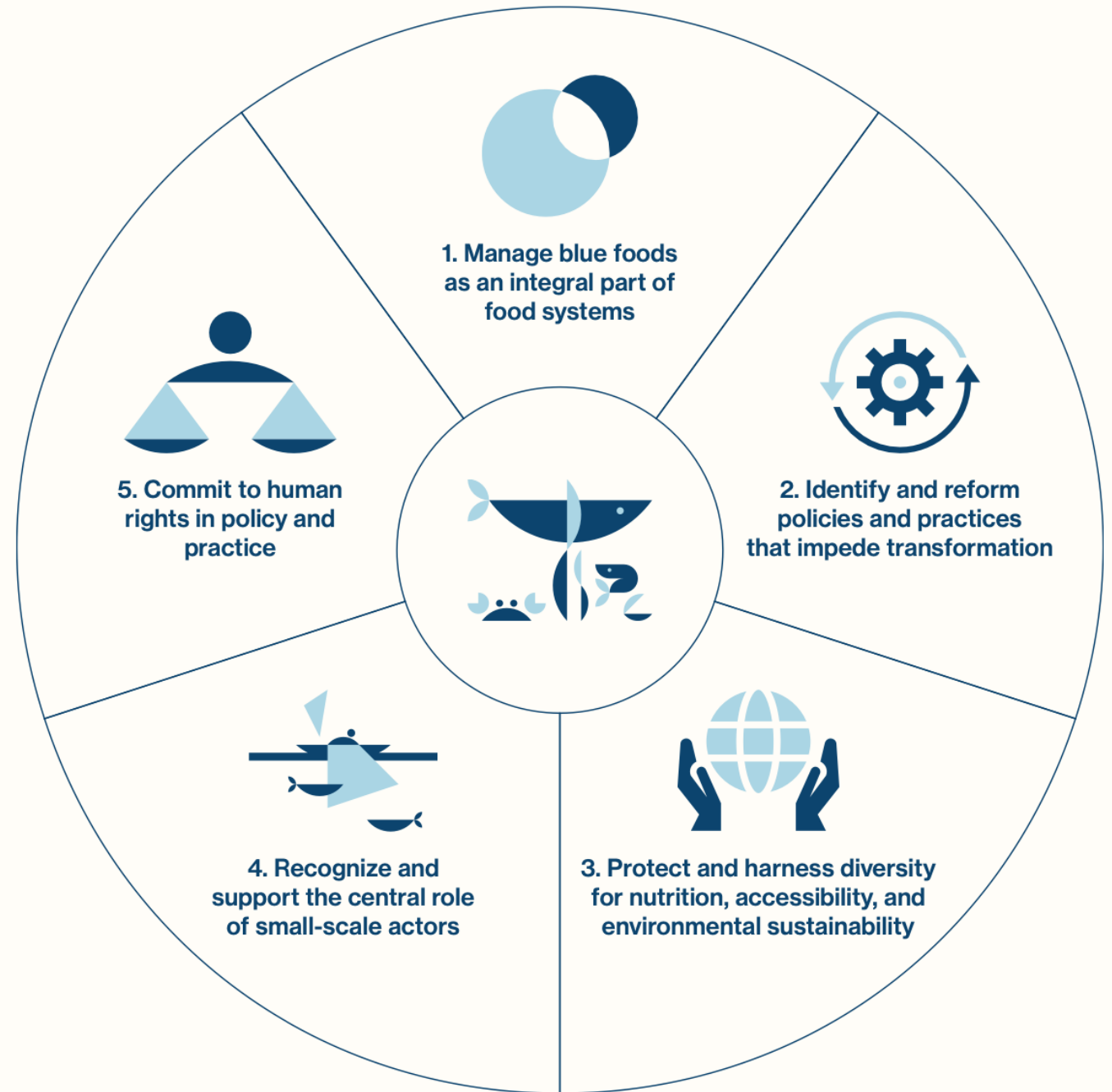
Environmental performance of blue foods



Recommendations

Five actions for food system transformation

Report of the Blue Food Assessment:
bluefood.earth/policy



Blue foods and their diversity, done right, can contribute to food systems that are *healthy, diversified, equitable, and environmentally sustainable.*

Summary

For more information

Access our research

bluefood.earth/science

Read our action briefs

bluefood.earth/policy

Download the Report of the BFA

bluefood.earth/policy

Join us on Twitter

[@BlueFoodFutures](https://twitter.com/BlueFoodFutures)

A photograph of a seafood market display. In the center, a large salmon is laid out on a bed of ice. In front of it, there are several salmon fillets and a large quantity of salmon steaks. To the right, there are stacks of salmon steaks. In the foreground, there are oysters on the half shell. Price tags are visible, including one for 'Oferta' at 8,99€ and another for 'SOLOMILLO DE ATUN' at 2,50€. A sign in the bottom left corner says 'FROM THE SEAFOOD COUNCIL'.

Sustainability as a crucial factor in the global seafood market

Renate Larsen, CEO



120,8

billion NOK

3,1

million tonnes

42

million meals
every day

150+

countries

Billion NOK

150

125

100

75

50

25

0

2011

2012

2013

2014

2015

2016

2017

2018

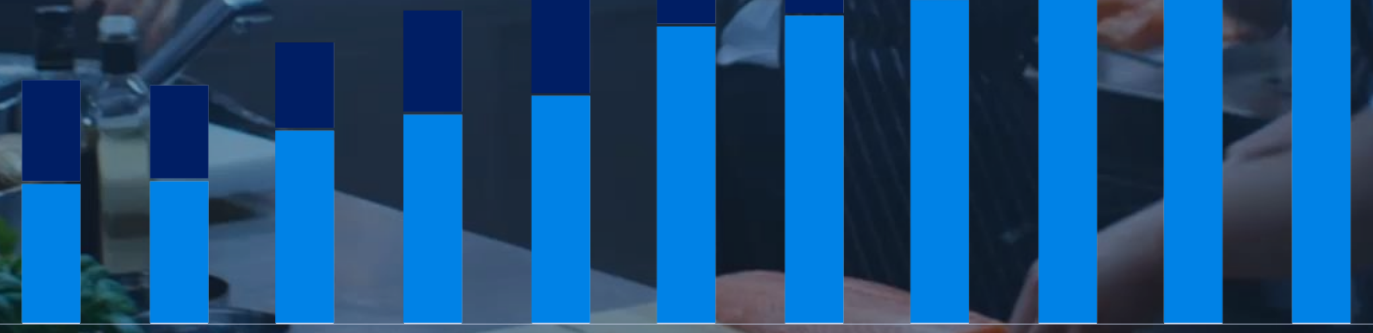
2019

2020

2021

Fisheries

Aquaculture



A responsible seafood nation





11th century

Stockfish, our first export



1816

*«Fisheries are, and hopefully will continue to be,
Norway's most important gold mine»*



1900

Institute of marine research
is established

A black and white photograph of a man in a suit and tie, smiling broadly while holding a large fish. He is standing in front of a flag with horizontal stripes. The image is overlaid with a semi-transparent dark blue filter. Two thin vertical blue lines are present: one on the left side of the man's head and one on the left side of the fish's body.

1946

The world's first minister of fisheries



1970

The rise of a new industry



A photograph of a fishing boat named 'LMKD' at sea. The boat is white with a red crane on the right side. A large black fishing net is being pulled up from the water, and several crew members in yellow and orange gear are visible on the deck. The sky is filled with many birds in flight. The water is dark blue with white foam from the net's movement.

1972

Herring fisheries is brought to a halt



1989

Fishing in Lofoten had to pause

A person is holding a smartphone, capturing a photo of a dish of salmon and vegetables. The phone's camera interface is visible, showing a white shutter button and a yellow level indicator. The background is a blurred scenic view of a body of water and mountains. A thin blue vertical line is positioned at the top center of the frame.

Today

Consumer trends



Important seafood trends going forward



New sales channels



Sustainability / Responsibility



Transparency



Health and wellness



Convenience



The demanding consumer

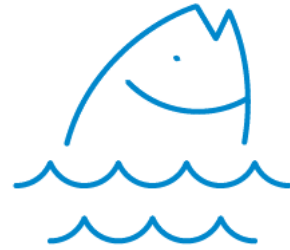


“ I want to eat food that’s good for me and my family and that I feel good about eating

Summary



Consumers will have great power

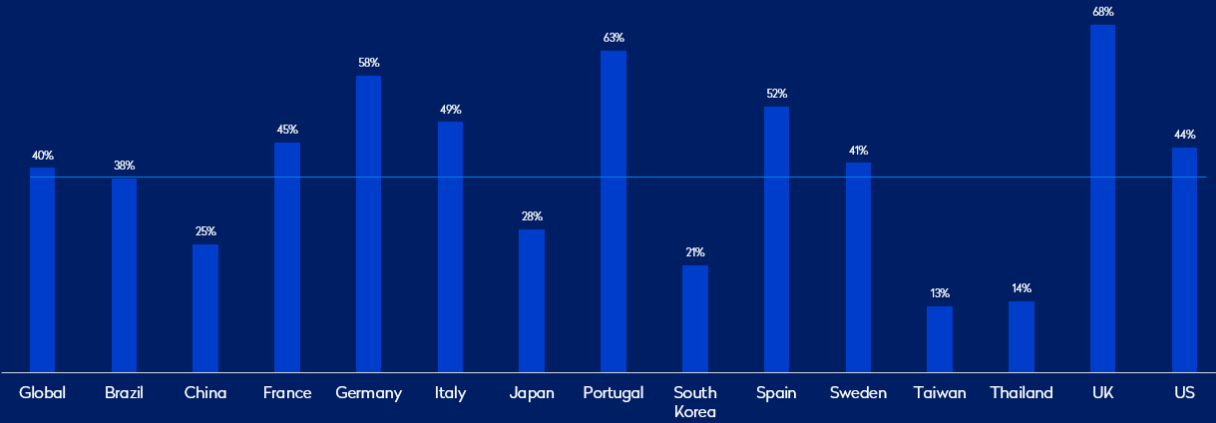


Seafood must have a minimal
environmental footprint



Sustainability is perceived differently

Sustainability for me is related to: Ethical Fishing/Catching methods, processing/production, transport, quota regulation/control/laws preserving species/do not overfish, medicines/antibiotics, animal welfare

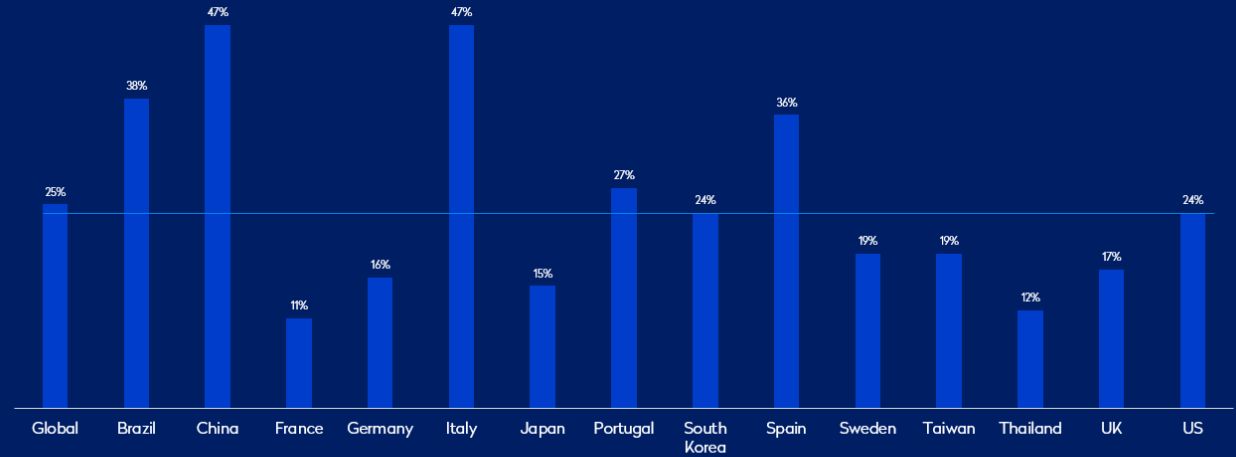


NORWEGIAN SEAFOOD COUNCIL

Base: n=14001



Sustainability for me is related to: Environment /environmentally friendly/gentle on nature, no pollution/not harmful to the environment

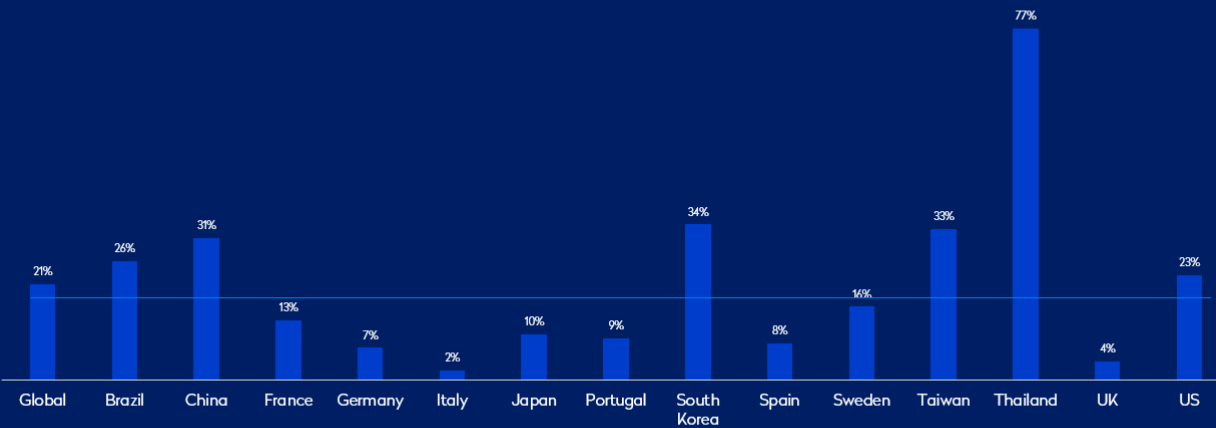


NORWEGIAN SEAFOOD COUNCIL

Base: n=14001



Sustainability for me is related to: Good product quality etc.



NORWEGIAN SEAFOOD COUNCIL

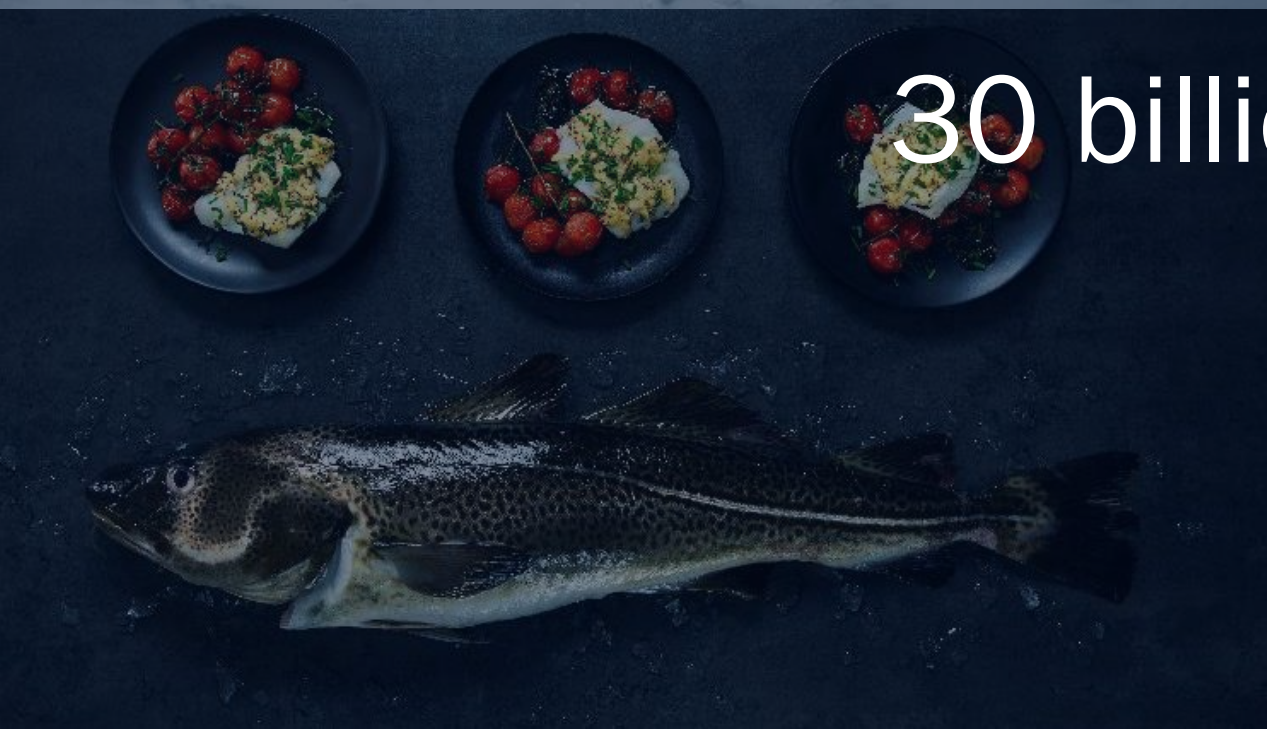
Base: n=14001



Huge difference in the perception of sustainability – and what it means to the consumer



The value of sustainability?



30 billion NOK





HIGH LEVEL PANEL *for*
**A SUSTAINABLE
OCEAN ECONOMY**

- “ (...) The ocean could supply over six times more food than it does today. This represents more than 2/3 of the edible meat that the FAO* estimates will be needed to feed the future global population.
- “ (...) eating more seafood can play a large part of the solution to the world`s climate challenges.

Commissioned by



HIGH LEVEL PANEL for
**A SUSTAINABLE
OCEAN ECONOMY**

BLUE PAPER

The Future of Food from the Sea

LEAD AUTHORS

Christopher Costello, Ling Cao and Stefan Gelcich

CONTRIBUTORS:

Miguel A Cisneros-Mata, Christopher M. Free, Halley E. Froehlich, Elsa Galarza, Christopher D. Golden, Gakushi Ishimura, Ilan Macadam-Somer, Jason Maier, Tracey Mangin, Michael C. Melnychuk, Masanori Miyahara, Carryn de Moor, Rosamond Naylor, Linda Nøstbakken, Elena Ojea, Erin O'Reilly, Giacomo Chato Osio, Ana M. Parma, Fabian Pina Amargos, Andrew J. Plantinga, Albert Tacon and Shakuntala H. Thilsted

oceanpanel.org



A scenic landscape featuring snow-capped mountains, a calm body of water, and a small boat in the distance. The mountains are rugged and covered in snow, with some peaks catching the light. The water is still, reflecting the sky and the mountains. A small boat with a red sail is visible in the middle ground. The sky is filled with soft, grey clouds, suggesting a late afternoon or early morning setting.

Financing a Sustainable Seafood Industry

Barcelona 25.04.2022

MARION REMØY

The world is scrambling to go green

Business as usual is no longer an option



- More than 70 countries, accounting for about 90% of global GDP
- More than 5.000 companies world wide
- More than 450 banks in 45 countries



The Foundations for Sustainable Finance

1. EU TAXONOMY



2. DISCLOSURES

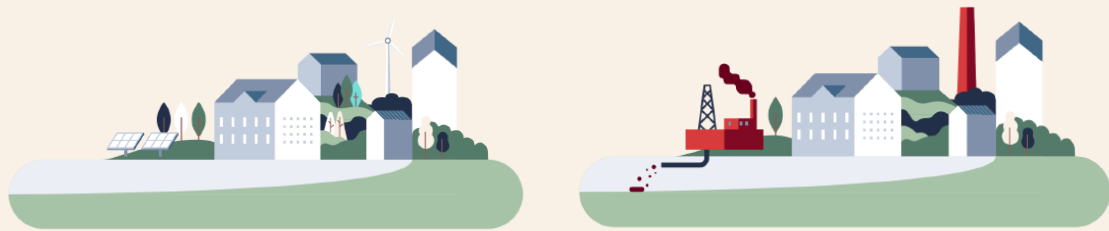


3. TOOLS





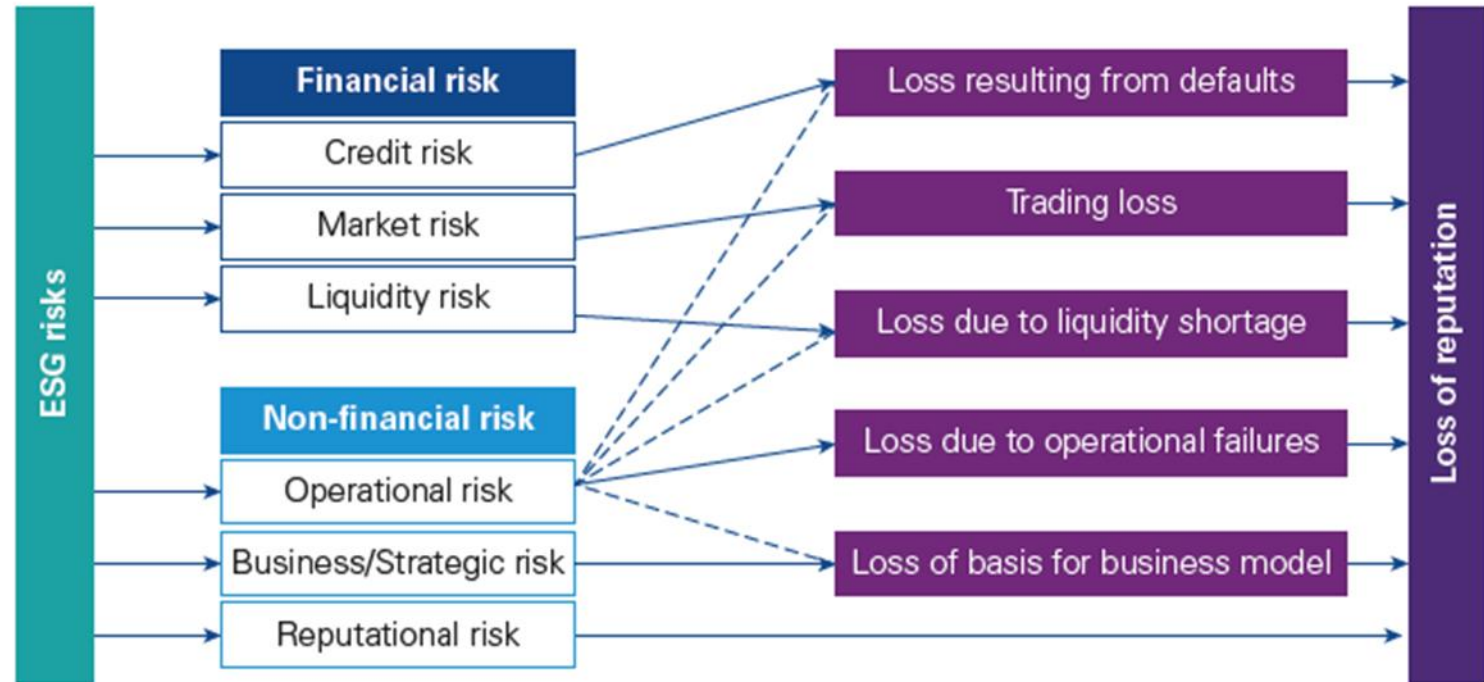
Green Asset Ratio (GAR)



Total Exposure

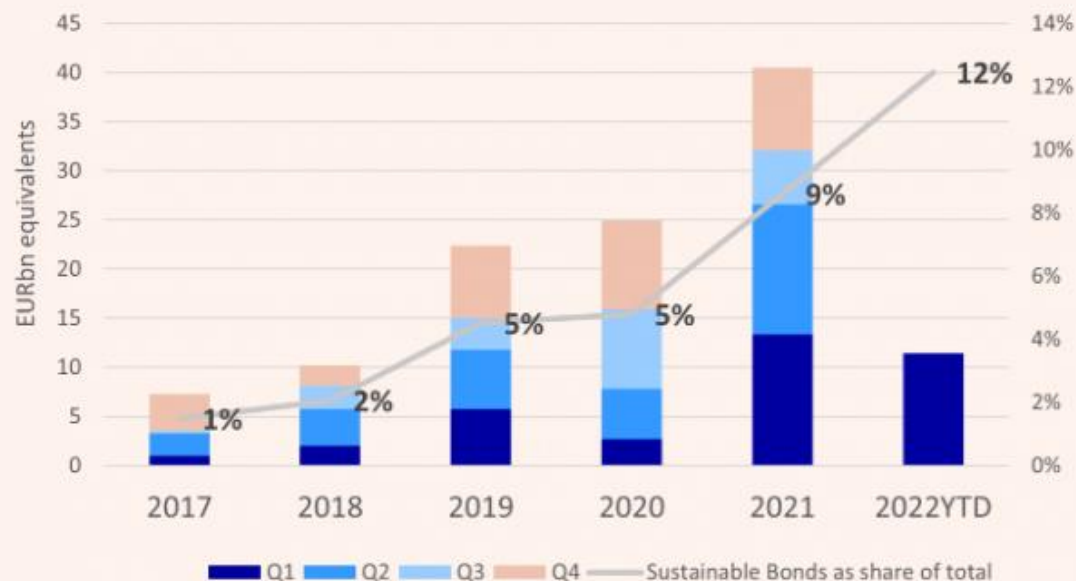
ESG risk carries an increased financial and regulatory risk

Banks can play a pivotal role in developing sustainable seafood



Sustainable debt remains highly relevant despite geopolitical and economic turmoil

2022Q1 Nordic Sustainable Bond Supply

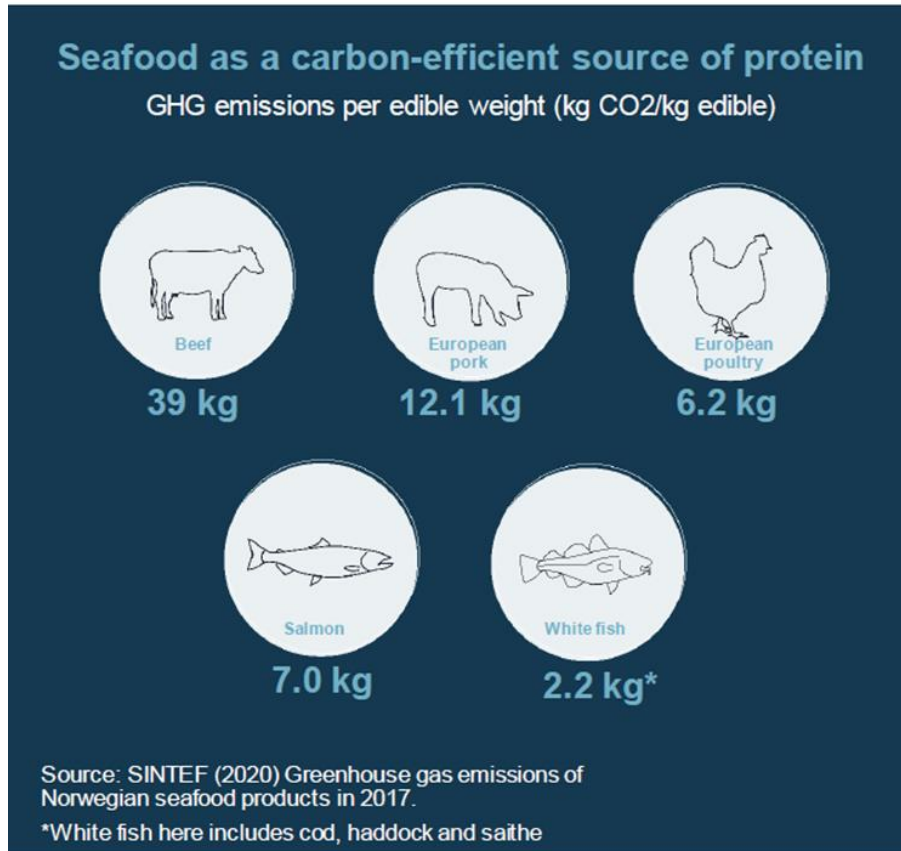


Source: Bloomberg and Nordea

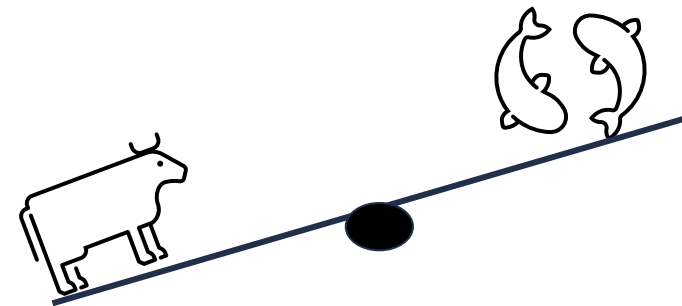
"the crisis in Ukraine is yet another reminder of how essential it is to implement the Green Deal and its Farm to Fork and Biodiversity Strategies."



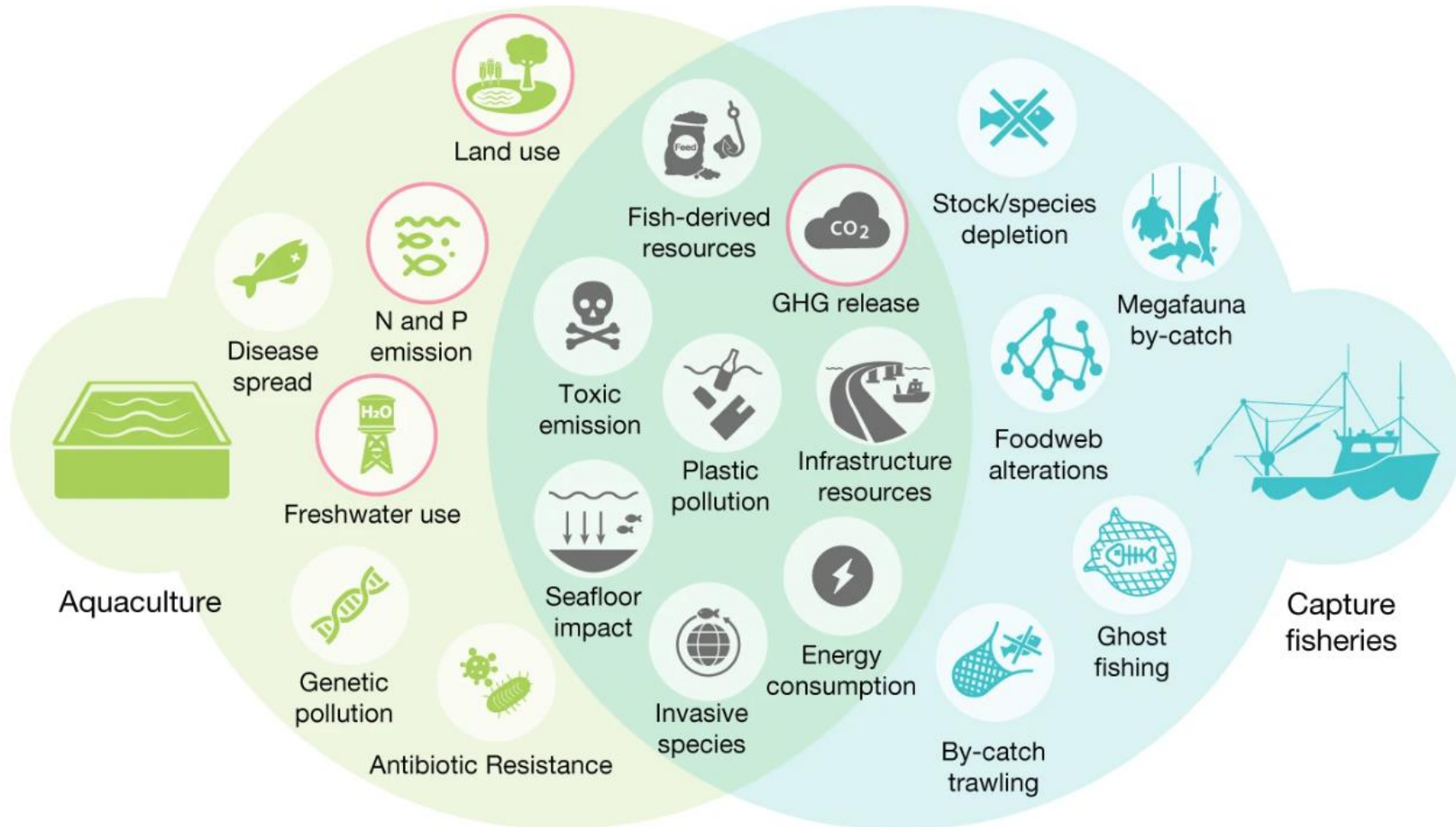
Sustainable seafood can contribute in ensuring food security in a low-carbon future



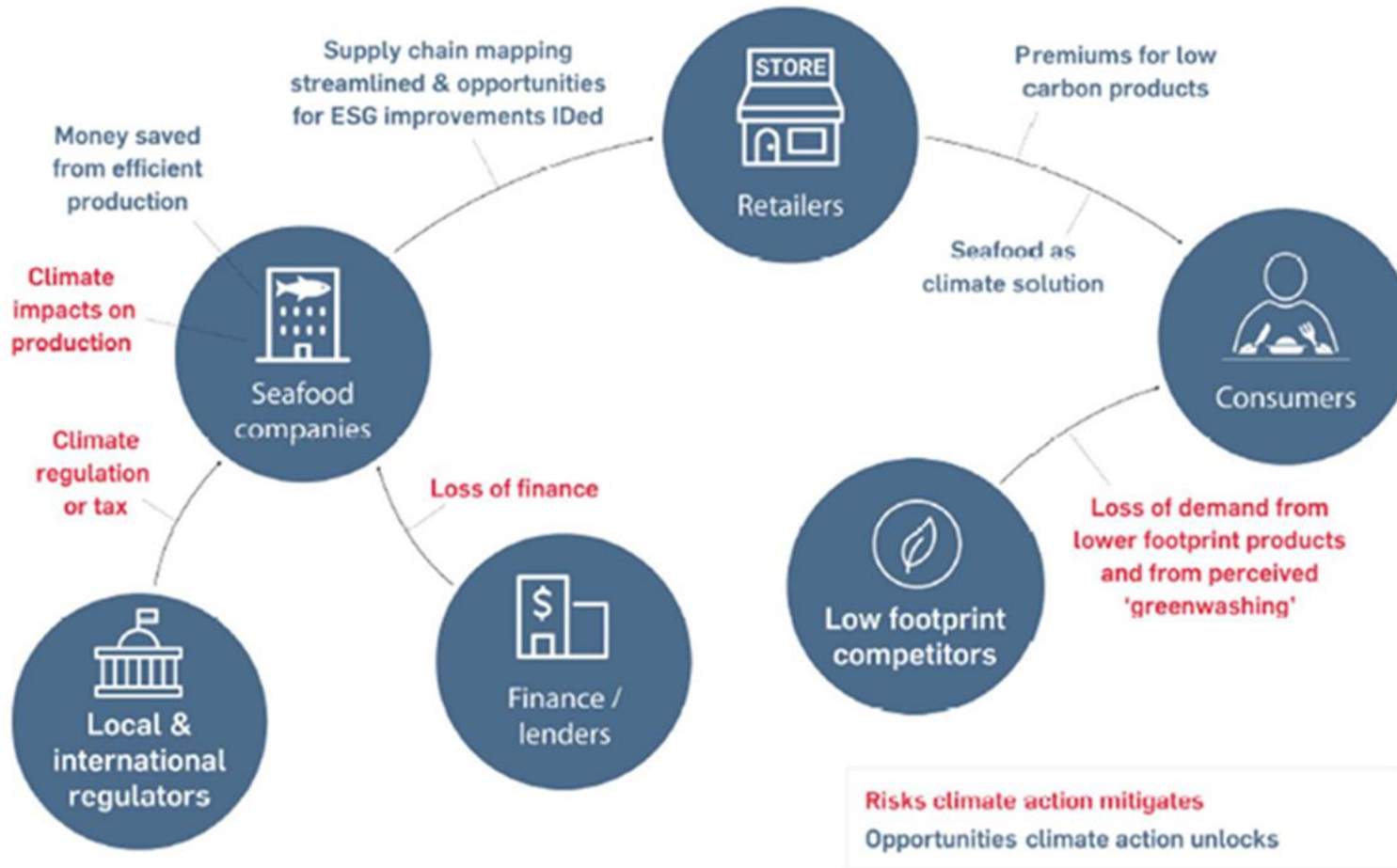
About 1/3rd of Global GHG emissions stem from the food system and high emission assets need to be ramped down



ESG challenges need to be addressed to realise the full potential of blue foods



Sustainability is a key to future competitiveness



Tesco commits to net zero emissions from its supply chain and products by 2050

24 September 2021

- New ambition is in line with UN aspiration of keeping global warming below 1.5C
- Retailer also sets out Group-wide net zero target of 2035 for its own operations, in line with its UK ambition
- Tesco will set out plans on how to cut emissions from all key emission sources
- Call to action to suppliers to work with Tesco to achieve this target

Our objectives
AND PERFORMANCE

Our 2020 goal:
50%
of fish sold under the Carrefour brand (and for national brands in the traditional section) will come from sustainable fishing by the end of 2020.





We can do it better together





HOW FISH FEED HELPED STOP DEFORESTATION IN BRAZIL

Leif Kjetil Skjæveland, manager sustainability and public relations, Skretting Norway





WE DID IT!

**Clean supply chain –
100 % deforestation free soy**

Ny rapport bekrefter: Norsk laks

e24.no/hav-og-sjoemat//ALBX5x/ny-rapport-bekrefter-norsk-laks-kan-ikke-knyttes-til...

E24 | Børs Aksjelive Fondselgeren Tips oss! E24+ Meny

Ny rapport bekrefter: Norsk laks kan ikke knyttes til avskoging

Leverandører av brasiliansk soya til norsk laksefôr er blitt helt avskogingsfrie i sine verdikjeder, ifølge en ny rapport. – Strålende nyheter, sier Regnskogfondet, og håper andre matprodusenter følger etter.



FÅR GRØNT LYS: En ny rapport slår fast at leverandører av soya til norsk lakseindustri ikke kan knyttes til ulovlig avskoging i Amazonas.
 Ueslei Marcelino / Reuters

Av Lage Bøhren
 Publisert: 3. februar


The Washington Post
 Democracy Dies in Darkness

Climate Solutions

Demand for meat is destroying the Amazon. Smarter choices at the dinner table can go a long way to help.

'We are going to be eating the rainforest in our burgers. This is our moment as Americans to step forward and leverage some pressure to save the world,' one scientist said.

By Richard Schiffman
 March 9, 2022 at 9:15 a.m. EST



Fire consumes land recently deforested by cattle farmers near Novo Progresso, Para state, Brazil, on Aug. 23, 2020.

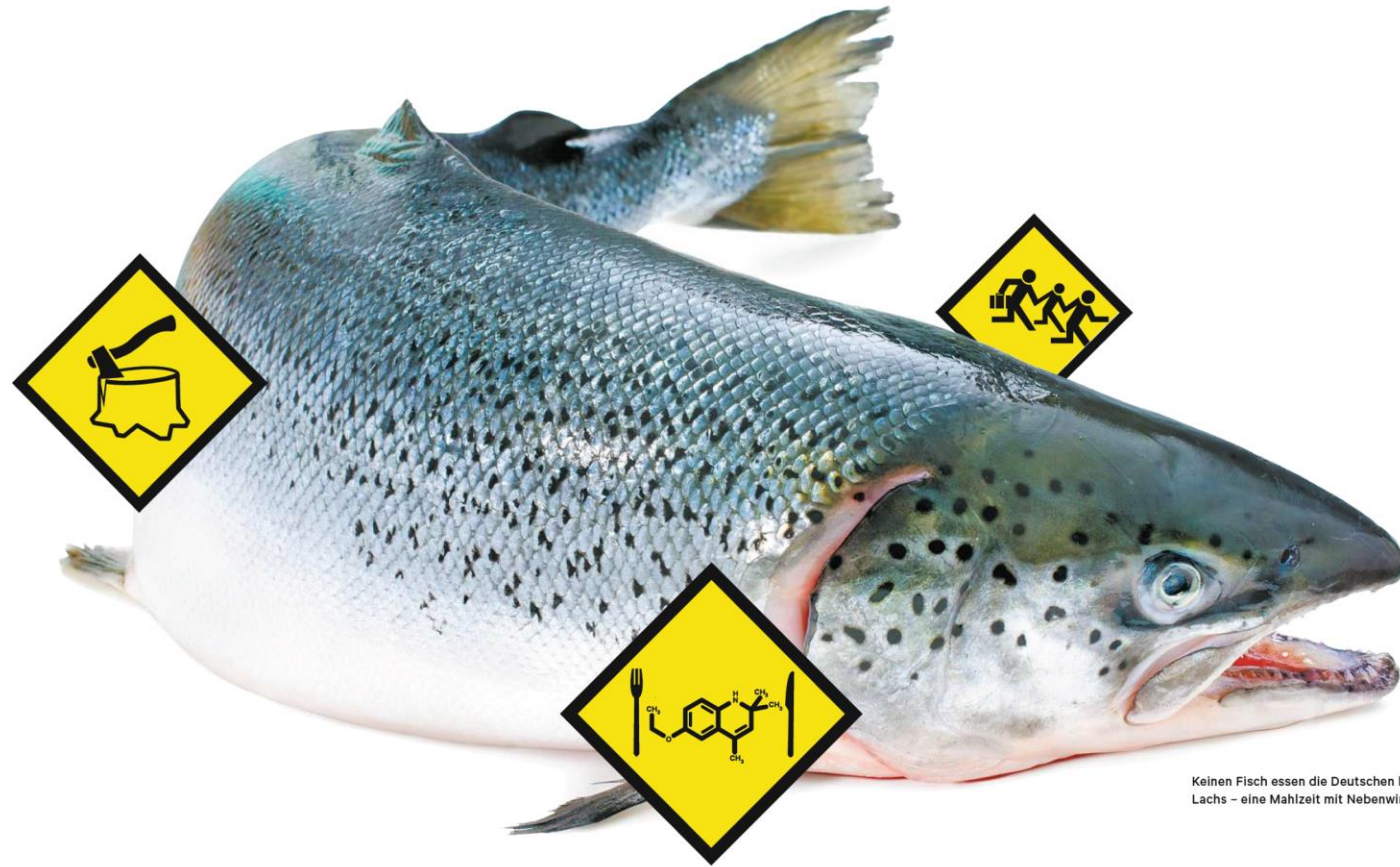
Deforestation in the Amazon can seem like a remote problem over which we have no control — but forest advocates say that's not true. They argue that smarter choices at the dinner table would go a long way toward safeguarding the world's largest rainforest.

In arguably the biggest success to date, “the Norwegian salmon industry, which supplies about half of the world’s farmed salmon, has cut all links to deforestation in their soy supply chains,” said Nils Hermann Ranum, whose Rainforest Foundation Norway helped to broker the deal. (Soy is the main component in fish feed.) “We now have an important producer of protein for human consumption that can claim to be fully deforestation free.”





Gegen Einwanderer,
Juden und Katholiken:
Der Ku-Klux-Klan
der Zwanzigerjahre
Seite 17



Keinen Fisch essen die Deutschen lieber als Lachs – eine Mahlzeit mit Nebenwirkungen

TITELTHEMA

Der gefährlichste Fisch der Welt

Ermordete Bauern in Brasilien, Explosionsgefahr auf Schiffen, Gift im Essen – das alles hat mit unserem Appetit auf Lachs zu tun. Eine Reportage darüber, was passiert, wenn sich die Menschheit eines wilden Tieres bemächtigt VON THOMAS FISCHERMANN, CHRISTIAN FUCHS, ANNE KUNZE, MARIA DA LUZ MIRANDA UND STEFAN WILLEKE



**“BUT WE ARE
BUYING THE
GOOD SOY!”**

Heve- og sukkerstoffer, ammoniumbikarbonat, emulgator (soyatecitin), aromaer.
220 g e Ca 31 Kjeke



Gjende

ORIGINAL

Uten palmeolje





“We see this voluntary sector-wide commitment as a **benchmark** to inspire other global animal protein sectors, as well as other markets linked to the soy supply chain. We celebrate together this relevant private sector led process for the protection of the unique Brazilian Cerrado”

*Maurício Voivodic, Executive Director
WWF Brazil*

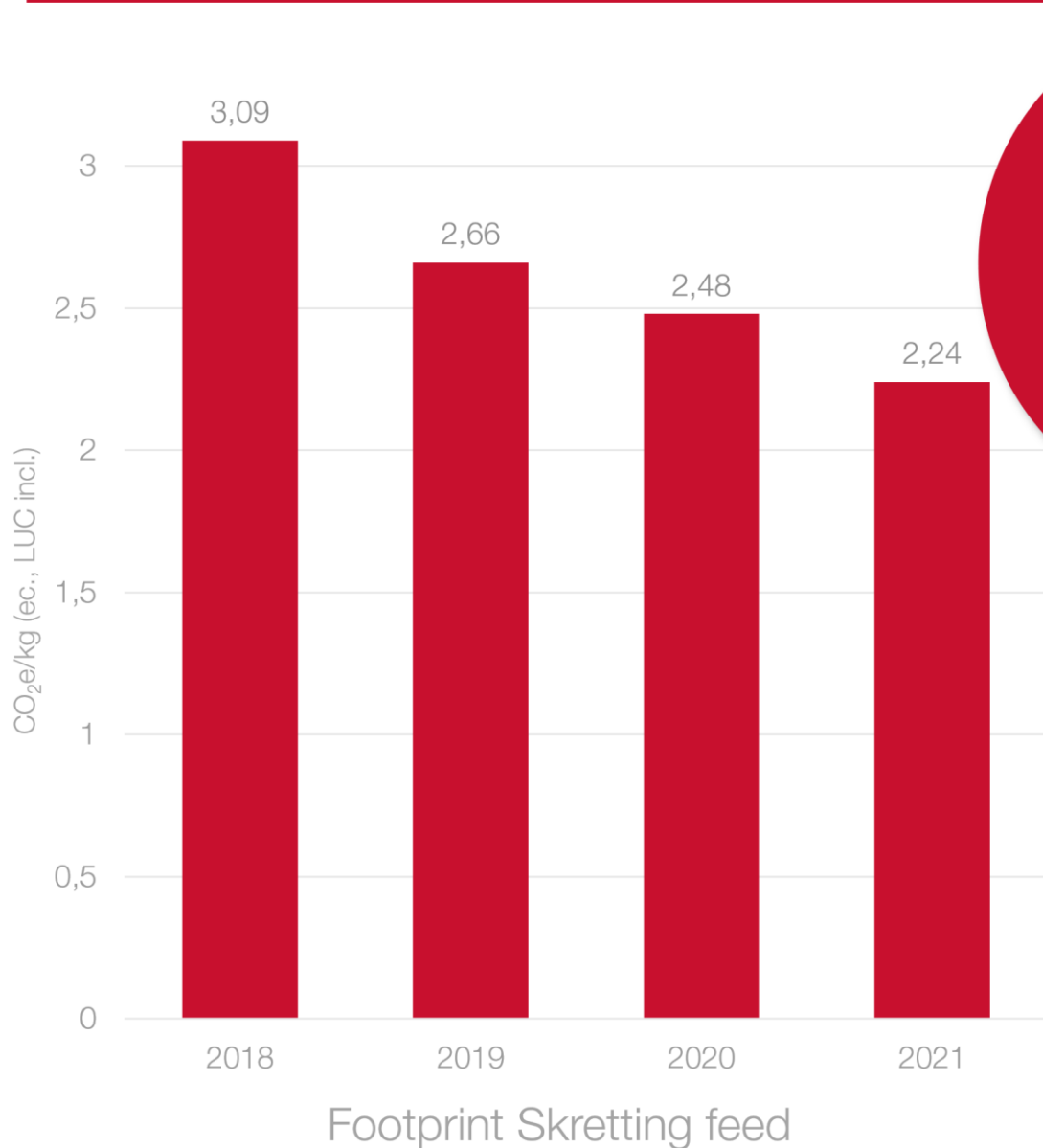
A somewhat late reply to your email below to say many congratulations on the ongoing attention being paid to this all-important salmon feed supply piece.

This is very much appreciated by Aquascot and by Waitrose and one sentence in your missive sticks out for me and that is “This proves that we can do more to protect the environment by working with our partners in Brazil, than walking away and just boycott soy”.

We absolutely agree with this approach so hats off to you and your team.

Waitrose

28 % footprint reduction because of raw materials



- This is mostly related to soy from Brazil – actions and improved data quality
- Also increased use of fishmeal, European soy and guar meal
- We can probably do even better in the future



Norwegian Embassy
Madrid



Innovation
Norway

NORWEGIAN
SEAFOOD COUNCIL



Norway