Impact Report 2023

SKRETTING
a Nutreco company

Chapters

CEO letter

> Switching from a Sustainability Report to an Impact Report is not just a change of name, but an acknowledgement that anything we do has an impact both on the environment and society. And we want to be accountable for that.

Welcome to our first Impact Report, which showcases the most relevant developments on our sustainability journey during 2023! Switching from a Sustainability Report to an Impact Report is not just a change of name, but an acknowledgement that anything we do has an impact both on the environment and society. And we want to be accountable for that.

It was another intense year for us in 2023, particularly as we get closer to 2025, a milestone year for our Sustainability RoadMap and the targets we have set. Although we present detailed descriptions and progress on our most relevant targets throughout this report, I want to reflect on a concrete example that I think illustrates what it takes to achieve these targets and why it's so important that the industry moves in the same direction to do the right thing.

Last year, 77% of the marine ingredients we purchased in our global operations were certified or came from a Fishery Improvement Project (FIP), a decrease from the 84% reported in 2022. While this is not something to be proud of, the volatility of the cost of fish oil, which hit historic high records, inevitably impacted the cost of feed. As a consequence, we saw the willingness to stick to – and pay for – certified ingredients decreased in some markets, which opened space for more ingredients of uncertified origins. Let's make sure 2023 was the exception.

Reaching our target to source 100% of our marine ingredients certified or from an FIP comes at a cost. If we look at the volume of uncertified ingredients in 2023 alone, paying the premium to replace them for certified ingredients would have cost our global operations around €70 million more. How could a business like ours absorb all this on our own? We need the industry to come together and share the responsibility to create a positive environmental and social impact. And we are committed to continuing to do our part by innovating on feed formulation to reduce our dependency on specific ingredients and bringing solutions that are cost-effective, while also looking for alternatives to engage on new FIPs that can expand the availability of certified marine ingredients in the future.

We encourage farmers to remain focused on sustainability standards in feed and help us stick to the ambition. This will also help us better mitigate risks such as Illegal, Unreported and Unregulated (IUU) Fishing, child labour and modern slavery. To make it possible, we need to work together, across the value chain, so that costs are shared by all players.

This is also a call to certification bodies. We invite you to be much stricter during your audits to identify the sources of marine ingredients and leave no room for interpretations about what is and isn't certified. We are happy to work together with you by sharing all our documentation to help you understand the processes and where there could be traceability issues.

This example illustrates just one of the dilemmas we face every day. Our approach is to be fully transparent – therefore, this report is not intended to tell the world how perfect we are, but rather to show our full impact: both what's going well and what needs to be improved.

This is a special report for me as it's the first one since I took over as CEO of Skretting in June 2024. While I'm proud of the work that we've done so far, I look forward to keep embedding sustainability as a fundamental part of our business strategy. I'm also determined to strengthen our collaboration with different stakeholders across the industry because I'm convinced that the only way to accelerate on the progress needed is by working together rather than in isolation.

I hope you enjoy our Impact Report, and I invite you to contact us here with any comments you may have. The feedback and questions we receive from all our stakeholders are incredibly important for helping to make sure we can do better every year as we journey towards an even more sustainable aquaculture industry!

Bastiaan van Tilburg
CEO
Skretting

What is this report about?

In this Impact Report, for the first time ever, we have disclosed the number of cases reported through "Speak Up", our whistleblower and grievance mechanism open to internal and external stakeholders. While this number is small – only ten cases – this doesn't necessarily mean we have no issues to address. It could also reflect a lack of internal and external awareness about the tool – so I highly encourage everyone with a concern about our operations to use it and help us do better!

To further enhance transparency, and in light of the increasing demand to further our life cycle assessment work, we decided to elaborate more widely in this area, disclosing absolute numbers on the scope 1, 2 and 3 and carbon footprint per ton of feed not only for our global operations, but also our different business units and, more particularly, within our BU Salmon, where we see an especially strong focus on our environmental impact. We also provided examples of how the carbon footprint varies per region and species due to variables such as purchasing, regulatory and market conditions and raw material availability and origins. We believe this will help readers to better understand the differences that exist per species and countries.

Since our sustainability story can only be fully explored through interactions with different stakeholders, we include their input throughout the report, in particular, what they find important for the industry to focus on. This feedback helps us to identify what direction we should take.

Another key focus for us in 2023 was to improve visibility and transparency of the sustainability practices within our supply chain. While we acknowledge that we're still far from where we want to be, we're happy to see the progress of our Supplier Sustainability programme through EcoVadis, which helps us to identify areas for improvement and drive positive change throughout our supply chains.

While Skretting Chile's achievement of becoming the first certified salmon feed plant in the world – according to the Aquaculture Stewardship Council (ASC) Feed Standard – came in January 2024, we included it in this report as another example of our commitment to leading on sustainability. The learnings from this experience will inform other of our operations as they perform their audits in 2024.

Lastly, we're convinced that everything we do is about people. Throughout this document, you will see the faces of team members helping us to drive our ambitions – but this is only a small representation of the more than 4,600 Skretting colleagues working across the globe to help us make a positive environmental and social impact. I would like to thank you all for your great efforts and encourage you to keep helping us and pushing us to do better every year!

I understand it's not always possible to read our entire report, so I've included some highlights below that I believe are well worth your time and attention.

Jorge Díaz
Sustainability Manager
Skretting

> Last year, we published what we believed was our most transparent report ever – and this year I believe we even went a step further.

Some highlights from 2023

→
During 2023, at least 17% of our scope 3 emissions were covered by commitments made through the Science Based Targets Initiative.

→
Details of where we use antibiotics and when.

→
92% of our soy was purchased as Class A or B.

→
77% of our marine ingredients were certified or coming from an Fishery Improvement Project (FIP).

→
For the first time ever, we published the total number of Speak Up cases reported – 10 cases.

→
Skretting's absolute carbon footprint rose by 4.1% in scope 1 and 2 from 2018-2023 but decreased by 11.1% in scope 3 during the same period. We explain why.

→
We continue to show our dedication to health, safety and the environment. For the second consecutive year, we achieved a significant reduction in the Total Recordable Case Frequency (TRCF), which decreased by 16% to 1.61 per 200,000 hours worked by the end of 2023.

→
Skretting Chile became the first certified salmon feed plant in the world, according to the Aquaculture Stewardship Council (ASC) Feed Standard.

→
Skretting's carbon footprint per ton of feed produced decreased by 32% globally from 2018-2023.

→
And, finally, I encourage you to read our "Collaboration with stakeholders" section, where we hear directly from them on a variety of important subjects.

Our role in the value chain

What does Skretting do? We innovate on aquaculture nutrition, all over the world. The most important species we make feed for include salmon, trout, shrimp, sea bass, sea bream and tilapia. We are part of a complex value chain, which we have briefly summarised here:

1
Primary producers

Agricultural crops, land farming and wild fisheries produce resources that are directly and indirectly used for food, feed and energy. If not managed properly, primary producers of feed ingredients can contribute to a loss of biodiversity, climate change and human rights violations. We have been actively working to eliminate deforestation in our supply chain and setting up a reduction strategy for scope 3 greenhouse gas (GHG) emissions caused, to a significant extent, by the production of primary raw materials.

2
Feed ingredient manufacturers

Feed ingredients are selected for a variety of reasons, including the nutrients they provide, the absence of anti-nutritional or undesirable substances, economics and sustainability credentials. Despite the challenge of finding the right balance between price and quality, we have been working to increase our use of novel ingredients and innovative feed additives.

3
Skretting

Skretting converts ingredients into innovative fish and shrimp feeds. Our operations are built upon a solid foundation of people provided with good and safe working conditions.

4
Farmers

Farmers feed their fish and shrimp with high-quality, nutritious food. Aquaculture performance is determined by animal health, nutrition and farm management. We actively launch initiatives to help farmers optimise fish and shrimp production and reduce their environmental footprint.

5
Food distributors and retailers

Food distributors have an important role to play in promoting and advancing sustainable consumption and seafood production. We have been actively working on collaborations with these stakeholders to bring more sustainable seafood to the market.

6
Consumers

People purchase and eat high-quality, safe and nutritious seafood products.

About this report

Our approach
Skretting has a longstanding commitment to reporting on the progress we make on our sustainability journey.

We have issued sustainability reports since 1999. Our first reports were compiled by Skretting Norway, and we have also reported on our global business activities since 2013. Our sustainability initiatives are closely linked to our business operations and priorities.

Reporting structure
This global Skretting Impact Report focuses on who we are and what our main sustainability activities were in 2023. It is available to our stakeholders and the public on our website. Our focus is to make it easier for readers to find the information that matters most to them. Local Skretting companies can also choose to publish their own sustainability reports to go more in depth on local challenges and achievements.

Scope of this report
The quantitative data reported here covers the calendar year from January 1 to December 31, 2023, unless otherwise stated. The report covers all companies that are part of Skretting, which represents Nutreco's aquaculture nutrition and service activities. Nutreco is owned by private company SHV, and all public financial information is reported through SHV. This report provides only limited financial information.

Reporting framework
We prepared our report in accordance with the GRI Standards: core option. This report also aligns with the United Nations Sustainable Development Goals (SDGs).

Assuring our disclosures
Skretting does not have external verification of the disclosures made in this report.

External links
Throughout this report, we have included links to a number of external websites to make it easier for the reader to learn more about our projects, partners and goals. These links are for reference only.

Collaboration with stakeholders
Skretting invited our various stakeholders to contribute their own views on relevant topics addressed in this report.

Business Units (BUs)
Nutreco is organised into a number of business units. These BUs are referred to throughout the report as:

Salmon:
Australia, Chile, North America and Norway

Latin America (LatAm):
Ecuador and Honduras

Southern Europe:
France, Italy, Spain and Turkey

Asia:
China, India, Indonesia, Japan and Vietnam

Africa:
Egypt, Nigeria, Middle East & Africa Export and a joint venture with Tunga Nutrition in Kenya

Our impact

In 2023, through our feed, we contributed to the production of more than 26 million portions of seafood meals per day across the globe.

RoadMap 2025

Health and welfare

Focus: Antimicrobial resistance

- Innovating new products and services that will reduce dependency on antibiotic usage in animal husbandry
- Adopting five-step targets that will significantly reduce antibiotic usage by creating business opportunities for clients

Climate and circularity

Focus: Reducing GHG emissions

- Setting science-based targets for reducing emissions through energy efficiency programmes and sustainable ingredient sourcing, incorporating lifecycle assessment methodologies and utilising new ingredients
- Addressing the responsible handling of natural resources, biodiversity and ecosystems

Good citizenship

Focus: Diversity and inclusion

- Building a more diverse and inclusive workforce
- Empowering local communities with best practices and technology to help people raise themselves out of extreme poverty through farming sustainability

1

Chapter 1
Health and welfare

Health and welfare

This pillar of RoadMap 2025 is primarily focused on addressing antimicrobial resistance (AMR) by reducing the need for antibiotics. As mentioned in previous reports, Skretting continues to believe that taking a holistic approach to animal health – preventing challenges through feed, farm and health management – is preferable to focusing on a cure for antibiotic use. This holistic approach can include sharing best practices – for example, on how to improve feeding regimes, install bird nets over ponds, improve biosecurity or support with in-house veterinarians – and is always tailored to the local market.

Not on target · In progress · On track

Our targets	Our 2023 progress
No preventive* usage of antibiotics in our products and services	No use
No use of antibiotics for growth promotion in our products and services.	No use
No use of antibiotics categorised by WHO** as “Critically Important for Human Health” (CIA) in our products and services.	Skretting used 1,987 kg of CIAs as an active ingredient, a decrease of 24% compared to 2021 and an increase of 6% compared to 2022.

* Any order of medicated premix/feed should be accompanied with a valid prescription from an authorised professional.

** As published in “Critically important antimicrobials for human medicine: 6th revision”

Our approach: Nutrition and health diets

Nutrition and health go hand in hand. With the correct nutrition and a proactive health feed to boost immune response, strengthening the gut and skin barriers in challenging periods will prepare fish and shrimp for difficult conditions.

Our approach has not changed over the years, but we did experience new challenges last year:

- Environmental change: In 2023, the summer period lasted longer. Hot summers are leading to increased ocean temperature, and situations in which fish in some areas are out of their optimal temperature range for longer periods of time. Drought conditions are also affecting the fresh water supply at hatcheries and land-based freshwater sites. This requires farmers to adapt feeding strategies and use new feed solutions.
- Temperature-related variations in bacterial load: With higher temperatures, summer bacteria are posing a threat over longer time periods. As a result, we have observed the emergence of new bacteria in some areas.
- Medicine availability: The availability of veterinary medicines, including vaccines, is under pressure. Vaccine companies withdrawing products from the market makes the industry more vulnerable.

We also saw some positive developments in 2023:

- Many countries have reduced their dependence on antibiotics over time.
- Cross-regional transparency has improved with open discussions and knowledge transfer to learn from each other on best practices.
- Our parent company, Nutreco, has invested in Nutreco Exploration's Garden of the Future, our centre for phytogenic solutions. Together, we will develop future-oriented solutions we can bring to the market.
- In 2023, the Skretting Health network (a group comprising veterinarians, health researchers, and marketing and product managers) met again to share updates on local challenges, best practices and the latest research. We discussed recent initiatives and success stories.

> Skretting is a feed company, but to reduce the need for antibiotics, we are embracing collaboration across the value chain to help grow healthy animals and bring nutritious food to consumers' tables.

Anna Hesby Nessa
Global Product Manager Health
Skretting

AMR: Reflections on our progress

Skretting is not the final user of antibiotics. We provide medicated feed to farmers based on prescriptions.

Despite many efforts to reduce antibiotic use, in 2023, veterinarians prescribed a slightly higher number of kilograms (kg) of CIAs compared to 2022 – yet the number was still lower than in 2021 and predominantly involving non-CIAs. Most farmers have reduced their antibiotic use, but last summer was, in general, extremely warm, particularly in Southern Europe, leading to an increase in bacterial issues, which, in turn, increased the use of antibiotics in some areas.

Overall, in 2023, the same health issues stood out as causes of antibiotic usage as in the previous year:

- Photobacteriosis, lactococcosis and furunculosis in Europe
- Bacterial kidney disease in North America
- Salmonid rickettsial septicemia (SRS) in Chile

These diseases are caused by bacteria that are difficult to prevent and control. Some of these bacteria “hide” from the immune system and easily spread throughout fish farms through incoming waters, faecal transmission, the persistent survival of the bacteria in sediment, the introduction of asymptomatic carrier fish and infected dead or dying fish. And when a fish is sick, it has the animal welfare right to receive treatment.

The industry is dependent on effective vaccines to tackle the most difficult diseases. And we are happy to see the progress made by the European Medicine Agency after defining the availability of veterinary medicines as a priority area. The development of new vaccines is expensive, time consuming and risky, so we are dependent on collaboration with the industry and governments to secure accessibility.

Antibiotic feeds as a percentage of total feed: Disclosure per country

	Norway	France	Spain	Italy	North America	Australia	Turkey	Chile	Total Skretting
CIA feed	0.003	0.005	0	0.50	0.03	0.00	0.00	0.001	0.015
Non-CIA	0.05	0.06	0.65	0.40	2.64	0.02	0.36	11.44	1.6
All antibiotics in total	0.05	0.07	0.65	0.90	2.67	0.02	0.36	11.44	1.58

Skretting has undertaken several initiatives to reduce dependency on antibiotics, even in parts of the world where we don’t produce medicated feed. You can read about some highlights here:

Partnering to help trout farmers fight disease in Italy

To help mitigate the major threat that the highly infectious bacterial disease Lactococcosis poses to aquaculture in terms of mortalities and production loss, Skretting Italy and biotech pharmaceutical company HIPRA came together in a new partnership to provide trout farmers with a practical and sustainable solution package focused on limiting the disease's impact.

The new Skretting-HIPRA collaboration followed a workshop addressing Lactococcosis management in trout production that the two companies jointly hosted at the Aquafarm 2023 exhibition in Pordenone, Italy.

To further help producers, the Skretting-HIPRA partnership produced a vaccination checklist that includes best-practice recommendations and sample social media content.

The best-practice manual gave advice for farmers on how to feed fish during challenging conditions and what to do before, during and after the vaccination process.

"This disease is the industry's number one threat, and it is becoming more and more problematic. However, through our commitment to responsible, progressive aquaculture, Skretting and HIPRA are working together to establish a clear pathway that benefits trout farmers – utilising our knowledge, experience and innovation to improve the health and productivity of farms throughout Italy and beyond," said Umberto Luzzana, Marketing Manager at Skretting Italy.

"The workshop we conducted together during Aquafarm 2023 on how to control Lactococcosis in trout farms was a very interesting collaboration. Together, we were able to present a comprehensive approach to addressing the Lactococcosis problem and demonstrate how feeding and vaccination can be utilised as complementary strategies to reduce its effects.The collaboration between Skretting and HIPRA exemplifies how two value chain companies in aquaculture can work together to enhance their customers' results," adds Rosa Merino, Global Technical Manager at HIPRA

Rosa Merino
Global Technical Manager
HIPRA

Empowering African aquaculture to navigate a sustainable future

In Africa, aquaculture holds immense promise for addressing food security challenges and fostering economic growth. However, its long-term success relies on ensuring that sustainable practices are used and emerging threats, such as AMR, are well managed. Sustainable aquaculture involves responsible resource management to ensure environmental, social and economic sustainability.

Together with Blue Planet Academy and other stakeholders, Skretting has developed online trainings for African fish farmers that cover all aspects of tilapia and African catfish farming, with a strong emphasis on sustainable fish farming. To maximise the results, the e-learnings are freely accessible to anyone who is interested. Close to 1,000 farmers have completed the course and the videos on the platform have received more than 22,000 views. By training farmers in efficient feed use, disease prevention and habitat conservation, we can enhance productivity while minimising environmental impact and production costs.

Since AMR poses a significant risk to both human health and aquaculture, the Blue Planet Academy module on sustainability emphasises responsible antimicrobial use, with advice on proper hygiene, disease prevention, and the prudent use of antibiotics under veterinary guidance. This approach helps mitigate the spread of AMR and protects public health.

The e-learning modules allow fish farmers to access training materials at their convenience, so they can balance learning with their daily responsibilities. This flexibility is especially beneficial for small-scale farmers in remote areas who may face logistical challenges attending traditional training sessions. The e-learnings allow us to reach and train African fish farmers continent-wide.

Projects like this, that equip farmers with the necessary skills to farm sustainably and productively, will unlock the full potential of Africa's aquaculture sector while safeguarding public health and the environment.

Scan the QR code and elevate your fish farming knowledge and practices.

Reducing the use of antibiotics through the Pincoy Project in Chile

Led by Skretting Chile, the collaborative Pincoy Project was born approximately seven years ago. Its objective was to find new formulas to reduce the use of antibiotics in salmon farming, by generating base information to help us make the best, most productive decisions.

In 2023, the centres that adopted the combination of factors studied by Pincoy, such as genetic selection, the use of vaccines and the adoption of functional diets, exhibited 46-50% less antibiotic use during the production cycle than the Chilean average reported by the regulatory agency, SERNAPESCA.

For 2024, the Pincoy Project will continue its collaborative work and expects to launch the second part of its Good Practices Manual, an update on the one published in 2020, that includes issues related to environmental challenges.

Chapter 2
Climate and circularity

Climate and circularity

This pillar of RoadMap 2025 is primarily focused on reducing our GHG emissions. To do this, we use science-based targets to set our ambitions for reducing emissions through energy-efficiency programmes and sustainable ingredient sourcing, incorporating lifecycle assessment methodologies and using new ingredients. We also address the responsible management of natural resources, biodiversity and ecosystems in the production of compound feed ingredients. In this section, we will discuss the dilemmas, the opportunities and the partnerships we have in place to ensure we can reach our ambitious targets.

Our targets	Our 2023 progress
Committed, through Science-Based Targets initiative (SBTi), to reduce scope 1 and 2 emissions by 30% compared with 2018 baseline	4.1% increase
Committed, through SBTi, to reduce scope 3 emissions by 39% compared with 2018 baseline	11.1% decrease
Increase renewable energy use in our operations	55.6% of electricity is renewable, up from the 54.7% reported in 2022.

● Not on target ● In progress ● On track

Considering all our impacts

The carbon footprint of aquaculture products is predominantly influenced by the carbon footprint of the feed. This holds true across species, regions and other environmental impacts beyond GHGs.[1] Even when considering the full life cycle, including distribution and consumption, feed remains a significant hotspot in the footprint of aquaculture products.[2]

The net environmental performance of a feed is determined by its footprint and its impact on the economic feed factor (i.e., fish sold/edible product per unit of feed). While the feed is just one of several factors affecting the economic feed factor, it is essential to consider nutritional and welfare properties alongside the feed's environmental footprint.

Skretting is dedicated to reducing GHG emissions in the entire life cycle, in collaboration with suppliers and customers. Only focusing on reducing the footprint of the feed may not help us to take the right decisions when it comes to reducing the carbon footprint of the end product – the farmed fish or shrimp purchased and consumed by the consumer.

Therefore, we should also consider what happens when the feed is used, because, for example, a feed with a higher footprint may lead to a lower feed conversion ratio (FCR) and therefore an end product with a lower total footprint.

Life-cycle mindset
We need to focus on the life cycle of the products and not on a single stage.

[1] Environmental performance of blue foods. Gephart J, Henriksson P, […] Troell M. Nature (2021) 597(7876) 360-365
[2] Marine Fish PEFCR: Screening and recommendations, Hognes E, Stenwig H, Report from the Marine Fish PEFCR pilot, (2016)

On the other hand, it is important to also have a multi-impact approach, which means that we need to quantify all the relevant potential environmental impacts.

Today, the conversation is mainly focused on having products with the lowest carbon footprints, but we also need to think about other impacts, such as water footprint, eutrophication, biodiversity loss, and many others, including all the relevant social impacts across our supply chain.

Adapted from Gephart, J.A., Henriksson, P.J.G., Parker, R.W.R. et al. Environmental performance of blue foods. Nature 597, 360–365 (2021)

Skretting's total carbon footprint

The following figures present the carbon footprint numbers for our scope 1, 2 and 3 GHG emissions from 2018 to 2023. The figures also show the carbon footprint numbers per BU. Looking at our total carbon footprint first, we see that the absolute carbon footprint of scope 1 and 2 (energy, water and waste emissions) has increased by 4.1% from 2018 to 2023. However, our scope 3 emissions (feed raw materials) have decreased by 11.1%. This results in an overall reduction over all three scopes by 10.4% over that same timeframe.

The specific carbon footprint per ton of feed produced has decreased 32% from 2018 to 2023. The long-term trend is positive, due to continuous efficiency improvements, changes in raw material compositions and sourcing. When we examine our business units with the highest production, which are the highest contributors to our carbon footprint, we see a variety of developments, but, overall, a substantial reduction by all BUs over the past two years. The recent reduction is largely explained by our success in improving the data quality (see **Improved soy and palm sourcing information.**).

In addition to disclosing data on our global operations, we present values per BU and more specific data from our Salmon BU, which includes Australia, Chile, North America and Norway.

In our salmon business, we have reduced both the absolute (kton CO_2e) and relative carbon footprints (ton CO_2e/ton feed produced) significantly over all three scopes between 2018 and 2023, despite an increase in scope 1 and 2 emissions from 2022 to 2023 in Norway. This is a very positive direction – and one that we will strive to continue in the years to come. While part of this reduction is due to a slight reduction in volume and changes in formulation, it shows a significant reduction effect, caused, for example, by changes in raw material sourcing (scope 3) and increased energy efficiency (scope 1 and 2). In our BU in Latin America (LatAm), the numbers look different. Due to significant business growth in Ecuador, the feed volumes grew, driving the increase to our absolute carbon footprint numbers from 2018 to 2023.

However, in the last year, we observed a reduction in the absolute carbon footprint of our BU LatAm compared to 2022, due to a significant 24% reduction in scope 3 emissions, despite increasing production volumes. The specific carbon footprint per ton of feed produced there decreased by a total of 29% from 2018 to 2023 thanks to a considerable reduction of 32% last year.

Improved soy and palm sourcing information

In 2023, we made a big step improving the data quality of our footprint calculations. Our Soy and Oil Palm sourcing policy provided the country of cultivation for each soy and oil palm ingredient purchased since 2020. Including the sourcing information for soy and palm ingredients to our footprint calculation structure led to a 12% reduction in our absolute scope 3 emissions, on average, over the past two years. This is mainly due to the overestimated contribution of land use change emissions when the sourcing country is not specified. Also, we obtained lower carbon footprint numbers by using more specific certifier and supplier data, compared to country averages. **We're encouraging our suppliers to commit to further reduce their emissions.** Scope 3 numbers presented in previous sustainability reports will therefore deviate from this report.

We will achieve further reductions by:

1. Reducing land use change impacts

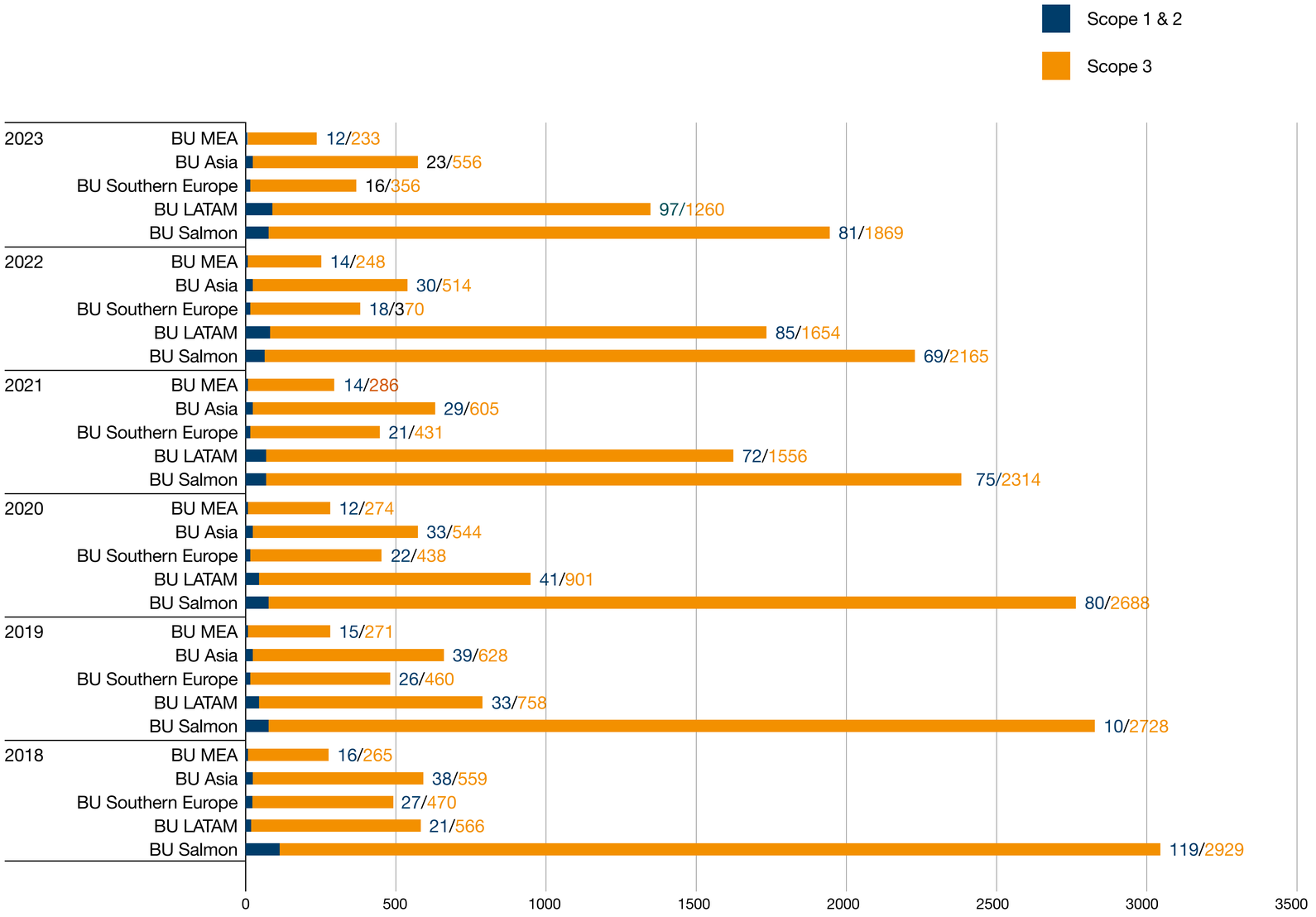
2. Identifying and increasing the share of low-carbon- footprint ingredients, with the following options:
   a. More by-products,
   b. More novel ingredients,
   c. More lower-footprint conventional ingredients

3. Supplier engagement

Global absolute greenhouse gas emissions (kton CO_2eq)

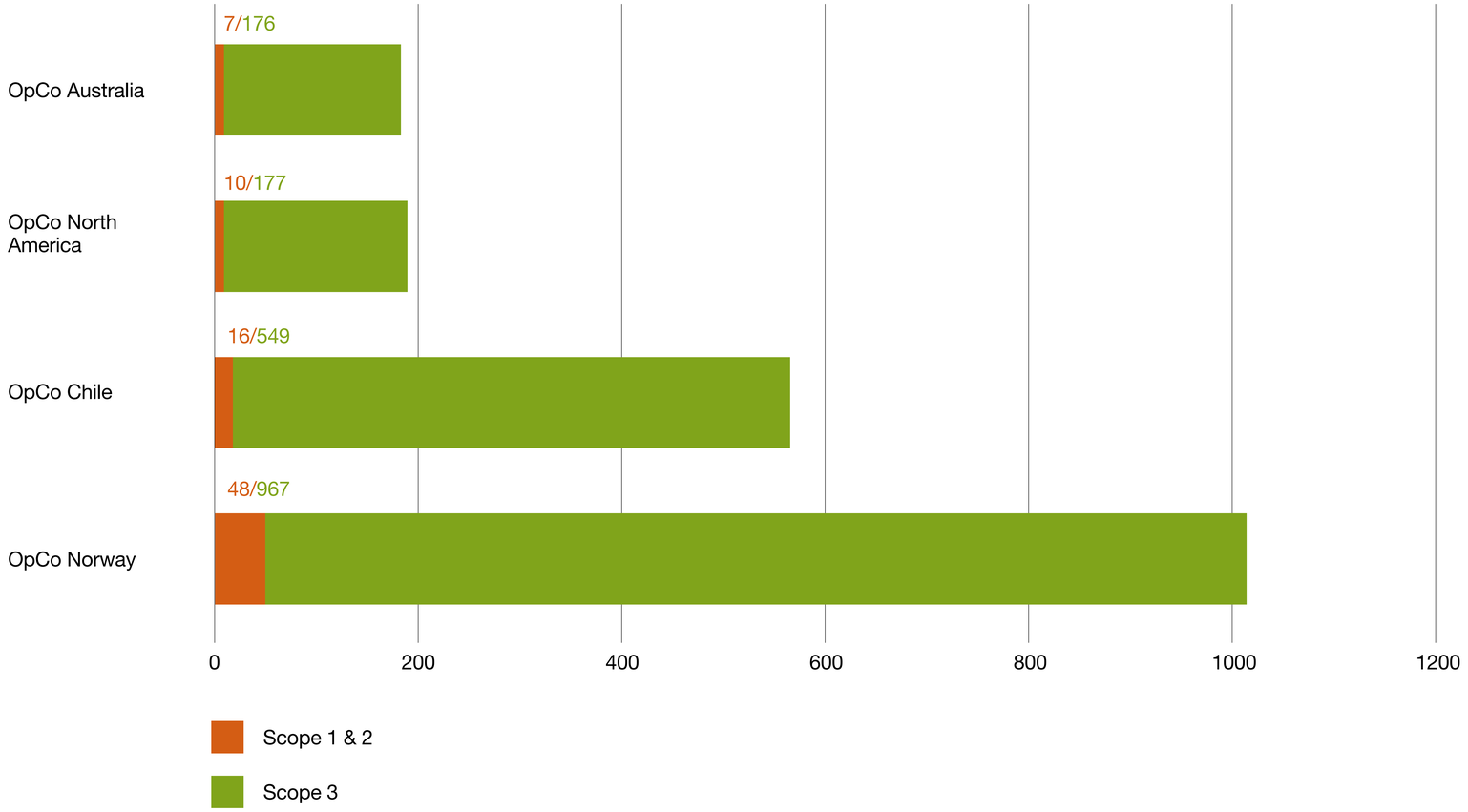
Skretting total	Unit	2018	2019	2020	2021	2022	2023	Change 2018 – 2023	Change 2022 – 2023
Scope 1 and 2 (Manufacturing process)	kton CO_2e	220	217	196	210	216	229	4.1%	6%
Scope 3 (Raw materials)	kton CO_2e	4,806	4,848	4,849	5,194	4,950	4,274	-11.1%	-13.7%
Total	kton CO_2e	5,026	5,065	5,045	5,404	5,166	4,503	-10.4%	-12.8%

Skretting´s absolute carbon footprint per BU at factory gate including scope 1, 2 and 3 from 2018 to 2023 (kton CO_2eq)



Absolute carbon footprint (*kton CO_2e)*	Scope	Change 2018 – 2023 (%)	Change 2022 – 2023 (%)
Global average	Scope 1 and 2	4.1%	6%
	Scope 3	-11.1%	-13.7%
BU Salmon	Scope 1 and 2	-31.8%	17.7%
	Scope 3	-36.2%	-13.7%
BU LatAm	Scope 1 and 2	358%	13.6%
	Scope 3	122%	-23.8%
BU Southern Europe	Scope 1 and 2	-38.9%	-7.7%
	Scope 3	-24.3%	-3.8%
BU Asia	Scope 1 and 2	-38.4%	-23.3%
	Scope 3	-0.5%	8.2%
BU Middle East & Africa (MEA)	Scope 1 and 2	-24.1%	-16.2%
	Scope 3	-12.1%	-6.0%

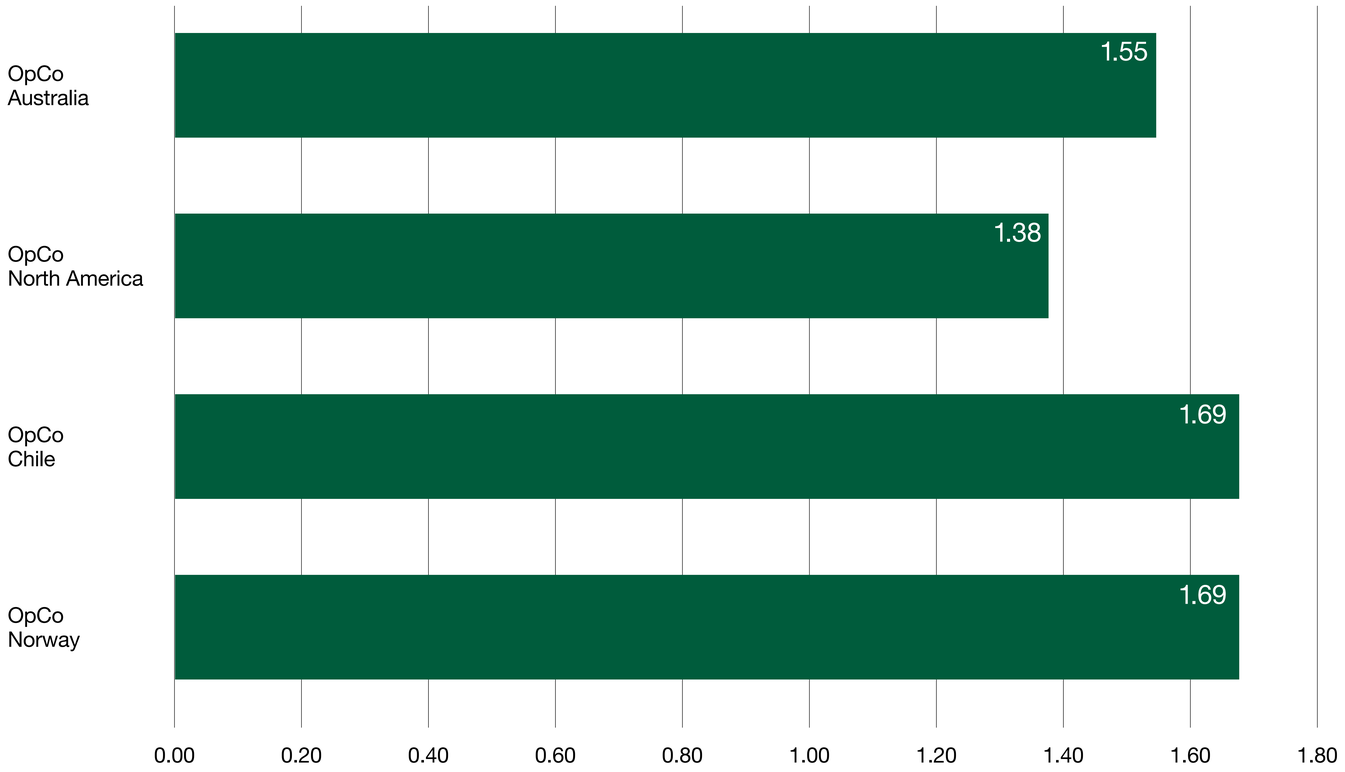
Absolute greenhouse gas emissions of BU Salmon 2023 (kton CO_2e)



Global carbon footprint relative to feed produced from 2018 to 2023 (ton CO_2e/ton feed produced)

Carbon footprint per feed produced	2018	2019	2020	2021	2022	2023	Change 2018 – 2023 (%)	Change 2022 – 2023 (%)
Global average	2.35	2.25	2.17	2.20	1.98	1.60	-32%	-19%
BU Salmon	2.52	2.33	2.25	2.05	1.90	1.64	-35%	-13%
BU LatAm	1.92	2.08	1.83	2.32	2.00	1.37	-29%	-32%
BU Southern Europe	1.66	1.57	1.54	1.45	1.39	1.45	-13%	4.1%
BU Asia	2.44	2.52	2.73	3.18	2.82	1.97	-19%	-30%
BU MEA	3.51	3.81	4.02	3.75	2.98	3.0	-15%	0.6%

Carbon footprint relative to feed produced BU Salmon 2023 (ton CO_2e/ton feed)



Scope 1 and 2: Improving our own operations

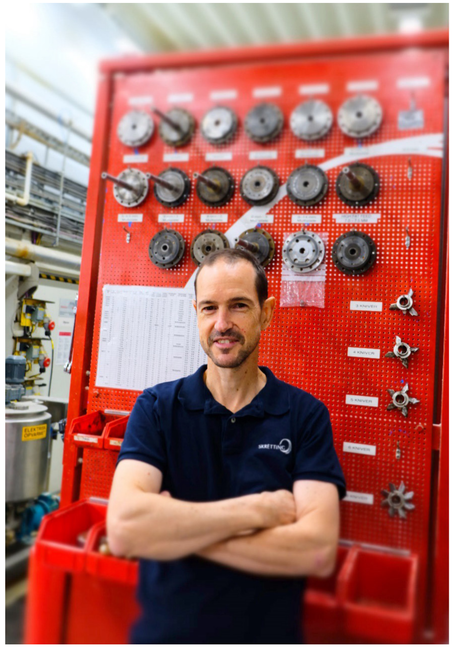
We continue to improve energy efficiency across Skretting globally by implementing many local initiatives. Over the last few years, we have worked hard to document and share energy best practice solutions between our factories. This is now paying off, with a 1.1% global reduction of energy per ton (specific energy). Our Skretting Egypt OpCo made the largest improvement in specific energy in 2023, with a reduction of close to 300 kWh/ton. When it comes to specific energy reduction, some of our factories are already high performers; for this reason, ongoing reduction will be in small steps.

For example, our factories at Skretting Norway, Chile, Spain and Italy are already at world-class level for the types of products they produce. For these advanced factories. The solutions required are more technical and often costly, such as installing new boilers, heat pump technology and heat recovery systems. The large energy reductions in the less mature factories come from easy wins, such as condensate return, steam pressure reduction and dryer optimisation.

Taking the first steps in the energy maturity journey is a big victory. Those first steps set the wheels in motion and, we have learned from experience, that we always see continual improvement from that point forward. We have found that our people are very motivated to work on energy and CO_2 reduction, because it has a tangible, real-world impact.

Having global networks in place to facilitate best practice exchange is another important driver for our success. Representatives from all our plants meet frequently online to exchange ideas and share local experiences. In addition, global support experts visit the plants to look for new opportunities. In 2023, we also received a lot of support from a fellow SHV company, EM3, which specialises in energy and carbon reduction solutions. Their support has helped us to implement many solutions across Nutreco.

> We have found that our people are very motivated to work on energy and CO_2 reduction, because it has a tangible, real-world impact.



Stuart Fyfe
Global Process Excellence Leader
Nutreco

Measuring our production KPIs

Specific energy consumption kWh/ton per BU

	2018	2019	2020	2021	2022	2023	% change from 2018	% change from 2022
Global	315	322	352	358	365	361	14.7	-1.1
BU Salmon	285	279	274	259	268	261	-8.4	-2.6
BU LatAm	351	436	466	477	463	463	32	-0.1
BU Southern Europe	352	349	390	332	340	2023	-3.4	-0.3
BU Asia	436	398	437	422	407	377	-13.6	-7.4
BU MEA[3]	800	800	565	607	582	634	-20.8	9

GHG emissions kg CO_2e/ton per BU

	2018	2019	2020	2021	2022	2023	% change from 2018	% change from 2022
Global	96	91	84	85	83	84	-12.9	1.1
BU Salmon	90.5	85.5	64.9	64	58.5	68.2	-24.6	16.7
BU LatAm	68.9	87	97.1	101.8	97.8	97.5	41.6	-0.4
BU Southern Europe	90.1	85.3	79	67.8	64	63.9	-29.1	-0.2
BU Asia	153.8	145.9	154.4	143.5	156.9	103.4	-32.8	-34.1
BU MEA[4]	200	200	165.3	175.5	165	174.3	-12.9	5.6

[3] 2018 and 2019 MEA data are estimated values
[4] 2018 and 2019 MEA data are estimated values

Measuring our production KPIs

Waste
kg/ton per BU

	2018	2019	2020	2021	2022	2023	% change from 2018	% change from 2022
Global	7.9	7.6	9.6	6.4	6.6	16.4	107	148
BU Salmon	9	9	9	7	6.8	8.6	-5	25.9
BU LatAm	5.8	6.3	14	5.6	6.3	4.3	-27	-32
BU Southern Europe	6	5	6	6	6	6.6	11	10.5
BU Asia	7	6	8	9	9	12	64	28
BU MEA[3]	6	4	3	3	2	5	-24	127.9

Water use
litres/ton per BU

	2018	2019	2020	2021	2022	2023	% change from 2018	% change from 2022
Global	631	637	678	658	626	680	7.7	8.6
BU Salmon	562	533	490	444	459	462	-17.8	0.7
BU LatAm	867	1,004	1,124	1,044	843	970	11.8	15
BU Southern Europe	526	508	595	479	532	597	13.5	6.3
BU Asia	840	766	797	850	864	696	-17.1	-19.4
BU MEA[4]	469	609	614	614	443	508	8.4	14.7

More efficient boilers

Boilers are the biggest consumers of energy in Skretting's operations and, therefore, the largest drivers of CO_2e production. The steam that we produce in our boilers is mostly consumed in the cooking process (during preconditioning and extruding) and, in many plants, is also used to make hot air for use in dryers. In 2023, we made a lot of positive progress around boilers. Skretting's Global Operations team made several onsite visits to support the teams in Ecuador, India and Vietnam with training and best practices for improving boilers and steam systems. These plants have made many improvements in their factories that were essential in reducing Nutreco's global average of specific energy in 2024.

We also made some big changes in boiler installations. In Skretting Norway's Averøy plant, the team installed an electric boiler, enabling them to go CO_2 neutral, pending the purchase of green electricity. The Skretting Chile plant in Pargua installed a new liquified petroleum gas (LPG) boiler to replace the old coal boiler. During the year, Skretting Vietnam also completely replaced their old Long An production site with a brand-new, state-of-the-art facility, switching from coal to biofuel at the same time. These two achievements marked the final removal of coal from Skretting's operations, and will enable us to achieve further reductions in CO_2 in the coming years.

In 2023 we removed coal in all our operations, which will enable us to achieve further reductions in CO_2 emissions in the coming years.

Reducing energy use in plants

Skretting Egypt achieved the largest reduction in energy per ton in all of Nutreco during 2023. They recorded a reduction of 293kWh/t – which is more than some plants consume in total over the course of a year. This equates to an annual savings of 1,500 tons of CO_2. The improvements they made were related to boiler and generator optimisations, and, to some extent, were helped by an increase in volume of feed produced – but the main driver was a motivated and passionate team.

Skretting Vietnam has also been focussed on energy reduction in 2023. The team achieved their lowest energy per ton performance in the last half of 2023, and new record lows are expected to continue in 2024. The Vietnam success once again comes from a team effort in working to understand power and achieve savings on site.

Skretting Ecuador is the largest energy consumer and biggest CO_2 producer in the Skretting group. The team started a project to convert their heavy oil boilers to gas, which will result in large CO_2 reductions expected to be realised in 2024.

Skretting China and solar power

In 2023, Skretting China installed solar panels on their facility's roof by sub-letting the space to an external party willing to invest in strengthening the roof and buying and installing the panels. Then Skretting China purchased the solar energy at an agreed price that is lower than their current electricity price. The saving in energy was 1.77 GWh per year and equates to an annual reduction of 1,035 tons of CO_2.

Challenges our OpCos face in reducing emissions

Investing in new equipment does not always translate to immediate improvements in CO_2 emissions. Our OpCos face many different challenges as they strive to operate more sustainably.

For example, Skretting Chile's Osorno facility experienced a breakdown in the boiler that forced them to rely on a rented boiler with high CO_2 impact, causing their normally exceptional CO_2 performance to spike in the wrong direction.

Skretting Norway produces some particularly challenging products that can require more water to be used in their production. This means that the products require more drying, which is an energy-intensive process.

The business in Norway also had to deal with a recent change from a location-based (local) to a market based-emission factor. We have applied this new emission factor to the OpCo's results for each year since 2018 to ensure consistency with our SBTi targets

The largest challenge our businesses faced was the growth in Ecuador, which increased absolute CO_2 values, despite improvements in CO_2 per ton (efficiency). As mentioned, the planned fuel change will be a significant turning point in this OpCo.

CO_2e mapping to zero

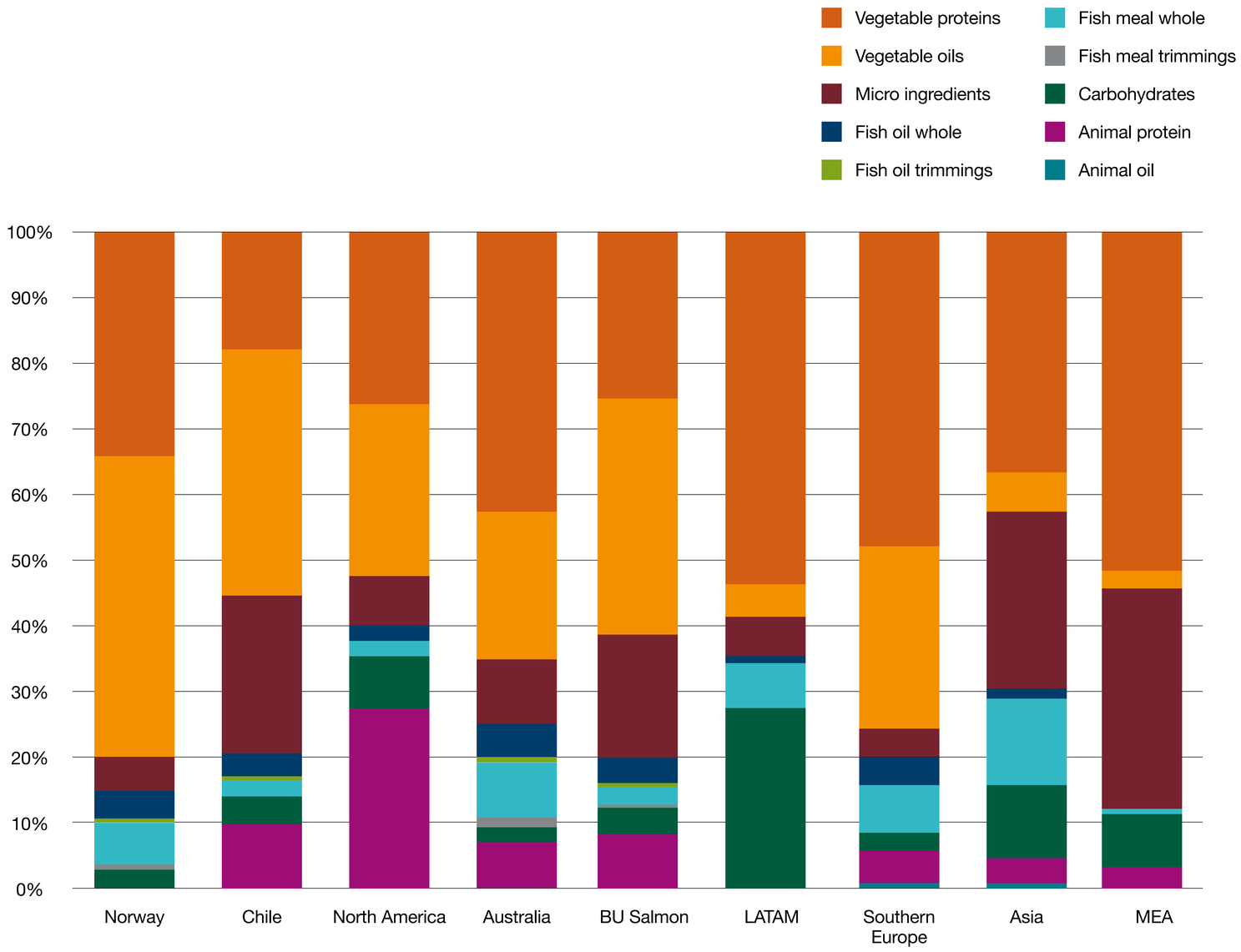
All of Nutreco's BUs participated in workshops in 2023, to assess their gaps to zero CO_2e performance and create action plans to get there. The process of mapping the CO_2e path to zero is an important step, and essential for Nutreco to meet our overall target of 30% reduction of absolute CO_2e by 2030. SHV company EM3 was an important partner in making these assessments in a number of factories.

A typical BU action plan starts with the easy wins, optimising processes and improving boiler efficiency. Later steps of the plan include more complex and costly actions like replacing the boiler, installing heat pumps and, of course, buying greener electricity, if it is not already being done. While there is still a lot of implementation work to be done, all the plans across Nutreco have been defined and evaluated.

Scope 3 emissions: Overview per ingredients and footprint drivers per region

	Norway	Chile	North America	Australia	BU Salmon	BU LatAm	BU Southern Europe	BU Asia	BU MEA
Animal oil	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.7%	0.4%	0.0%
Animal protein	0.0%	9.8%	2.7%	7.1%	7.9%	0.0%	5.0%	4.3%	3.4%
Carbohydrates	2.8%	4.3%	7.6%	2.6%	4.0%	27.4%	2.9%	11.1%	8.0%
Fish meal trimmings	0.7%	0.0%	0.0%	1.3%	0.2%	0.0%	0.0%	0.0%	0.0%
Fish meal whole	6.4%	2.4%	2.5%	8.3%	3.2%	6.8%	7.4%	13.1%	0.7%
Fish oil trimmings	0.7%	0.6%	0.0%	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%
Fish oil whole	4.3%	3.7%	2.5%	5.1%	3.8%	1.4%	4.1%	1.5%	0.1%
Micro ingredients	5.0%	23.8%	7.6%	10.3%	18.7%	5.5%	4.4%	27.0%	33.7%
Vegetable oils	46.1%	37.7%	26.1%	22.4%	36.3%	5.5%	27.9%	6.1%	2.9%
Vegetable proteins	34.0%	18.3%	26.1%	42.3%	25.2%	53.4%	47.7%	36.5%	51.2%
Not identified	0.0%	1.2%	1.7%	1.3%	1.2%	2.7%	0.0%	0.0%	0.0%

Footprint drivers per BU



The main ingredients that drive our BU Salmon's footprint are vegetable protein (mainly soy protein concentrate, wheat gluten vital, maize gluten meal and guar meal) and vegetable oils (mainly crude rapeseed oil). Micro ingredients, such as amino acids and premixes also contribute substantially. Fishmeal and animal protein (mainly poultry meal) contribute in a more minor way. Carbohydrates are even less important contributors to the footprint.

There are large differences between the different OpCos that are part of our BU Salmon. For example, animal protein is not used in Norway, but is an important source in North America and also used in Chile and Australia. There is a larger share of vegetable oils in Chile, while vegetable proteins are more dominant in Australia, and Norway has a large share of both. The use of micro ingredients is also highly varied, mainly due to variations in the use of amino acids and premixes.

The main footprint driver for our BU LatAm, which produces shrimp feed, is vegetable protein (mainly soybean meal and maize distillery dry grain soluble (DDGS)), followed by carbohydrates (wheat), vegetable oils (soybean oil and lecithin) and fish meal. Animal protein (porcine blood haemoglobin) makes a smaller contribution to the BU LatAm footprint. Amino acids and other micro ingredients, such as magnesium oxides, also make a small contribution.

The main footprint driver for our BU Southern Europe is vegetable protein (mainly soy protein concentrate, wheat gluten vital, maize gluten meal and guar meal), followed by vegetable oils (mainly rapeseed oil) and fish meal. Animal protein (poultry meal) makes a smaller contribution in the BU Southern Europe. Carbohydrates are even less important contributors to the footprint. Micro ingredients also make a small contribution.

The main footprint driver for the BU Asia is vegetable protein (mainly soybean meal), followed by micro ingredients. Fish meal and carbohydrates both contribute about 10%. Fish oil and vegetable oil make a small contribution.

The main footprint drivers for the BU MEA are vegetable protein (mainly soybean meal). Micro ingredients – mixes of organic acids – salts and/or preservatives, but also amino acids make a relatively large contribution compared to other BUs. Carbohydrates such as maize grains make a smaller contribution to the footprint.

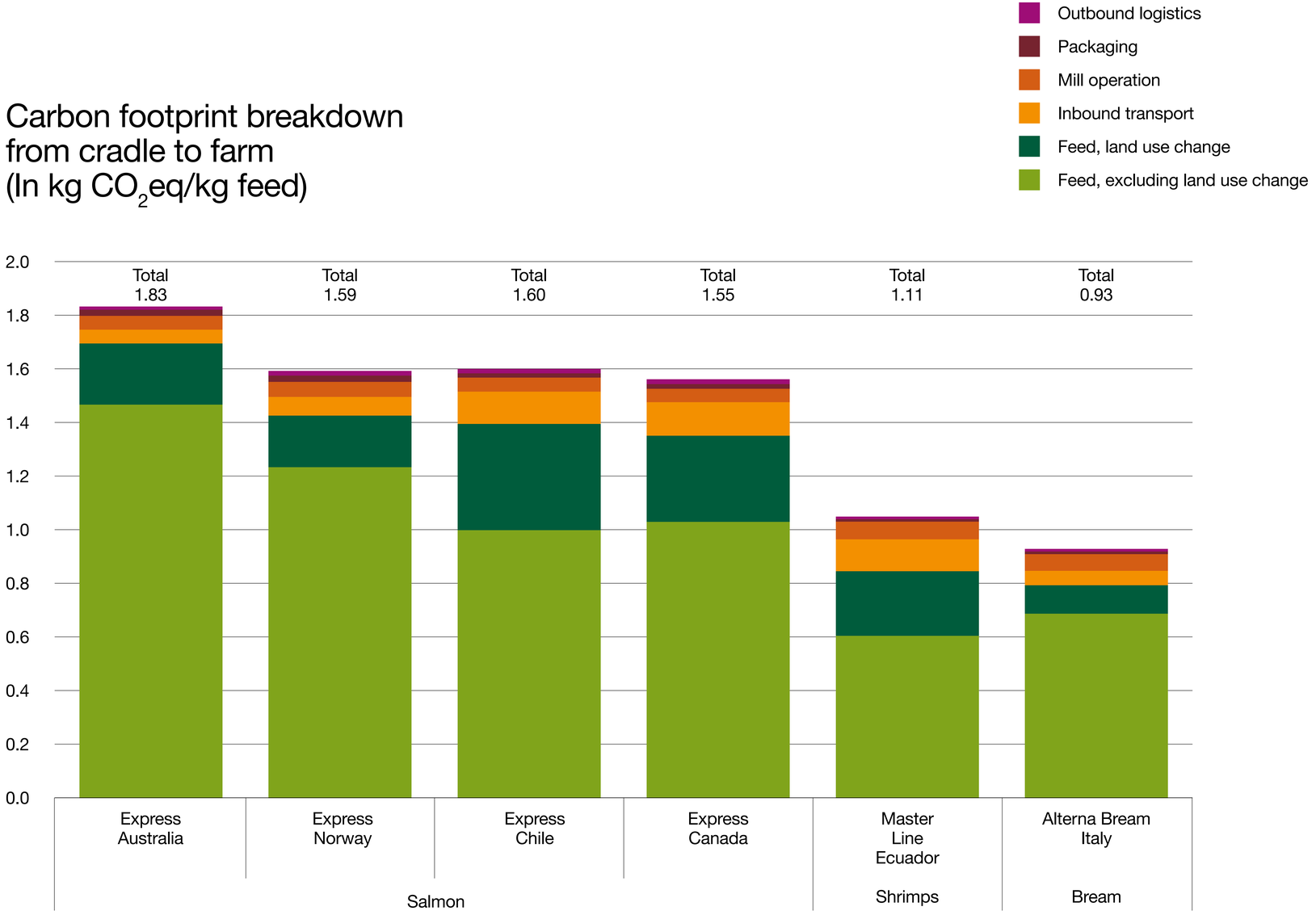
Carbon footprint across countries and species

The carbon footprint of our feed can differ significantly, depending on the species but also on the regions and markets where it is produced and sold.

Differences based on species can be due to the diverse nutritional requirements within their specific environments, which influence the types of ingredients that are needed in the feed. The biophysical characteristics of the feed itself also have an impact, for example, in reducing feed loss and optimising feed uptake, which can further reduce the footprints of the final consumer products.

Purchasing and regulatory and market conditions can also be quite different in the various regions and countries of the world. This impacts the feed composition, raw material availability and origins, and, subsequently, the feed footprint. To provide further insights into these differences and the main causes, see *Carbon footprint breakdown from cradle to farm.*

Carbon footprint breakdown from cradle to farm (In kg CO_2eq/kg feed)



Our ingredient scope 3 approach

By engaging with suppliers, requesting LCA data and supporting SBTi commitments, we ensure that sustainability is integrated into our supply chain's daily operations.

Skretting aims to foster a collaborative approach to reducing the impact of the aquaculture industry by actively involving our partners in the discussion. Our ingredient scope 3 approach was set up together with our parent company Nutreco and has enabled us to take significant steps in 2023 to engage suppliers on our journey to reduce our environmental impact. We proactively reached out to our supply chain partners, prioritising those with the highest contributions to our Scope 3 emissions. Through these discussions, we sought to gain an understanding of the suppliers' GHG-reduction commitments and plans.

As part of the engagement process, Skretting requested life cycle assessment (LCA) data from its suppliers. During this process, our aim is to not only understand the emissions associated with the products supplied but also to assist suppliers in comprehending the requirements and implications of the Product Environmental Footprint Category Rules (PEFCR) Feed standard. Adhering to these requirements is important, as any data that does not comply cannot be used for product footprinting and, therefore, does not support our customers in making sound and sustainable choices.

In 2023, we were able to discuss the LCA data and commitment requests with suppliers contributing to 42% of our total scope 3 emissions. We have observed that at least 17% of Skretting's scope 3 emissions are covered by commitments made through the SBTi, demonstrating our supply chain's dedication to setting ambitious emissions reduction goals.

These achievements underscore Skretting's commitment to sustainability and its proactive approach to addressing scope 3 emissions. By engaging with suppliers, requesting LCA data and supporting SBTi commitments, we ensure that sustainability is integrated into our supply chain's daily operations. As we continue to collaborate with suppliers and pursue ambitious reduction targets, it remains at the forefront of driving positive change within the aquaculture industry and advancing towards a more sustainable future.

Engaging our supply chain for scope 3 reductions

	Engaged	SBTI committed
Salmon	59%	12%
LatAm	33%	28%
Southern Europe	30%	11%
Asia	11%	20%
MEA	2%	4%
Grand total	42%	17%

Our LCA Journey: Main progress in 2023

In the dynamic landscape of 2023, we put a strong focus on automating and digitising our LCA solutions to enable fast, reliable and auditable footprint calculations.

We also updated our internal LCA database, aligning it with the latest industry data and relevant standards. At the same time, we streamlined processes for requesting and validating consistent supplier footprint data.

Key activities in 2023:

1
Digital transformation of our internal LCA database
- We transitioned our internal LCA database to a cloud-based, API-ready solution, to enhance accessibility, scalability and real-time collaboration.
- We made significant steps in integrating LCA data with internal data systems to enable automated batch-level carbon footprint calculations and reporting.

2
Data excellence: updates and quality assurance
- We updated our LCA database with the newest versions of secondary LCA data.
- We defined stringent quality criteria for supplier LCA data, enabling approved supplier data to now seamlessly integrate into our assessment processes.

3
Enhancements to corporate carbon footprint visibility
- We introduced traceability data for soy ingredients, enhancing transparency and accountability.

4
Certification and verification milestones
- We achieved certification for our Skretting Italy carbon footprint solution against the PEFCR feed standard. Simultaneously, we initiated the verification process for our global LCA system with an external party.

5
Risk assessment and new metrics
- We put in place new metrics, including Forest, Land and Agriculture (FLAG) and non-FLAG indicators, peat oxidation assessments, and a semi-quantitative error indicator, to enrich our analytical toolkit.
- We assessed water risks associated with our operations.

6
Collaborative leadership
- We actively participated in industry forums, joining the Global Feed LCA Institute (GFLI) Technical Management Committee and the IDH Aquaculture Working Group and Biodiversity Committee, with the goal to drive standardisation and pioneer impactful metrics.

We faced the challenge of scaling up our LCA calculations to meet the growing demands of our stakeholders, such as customers, who are increasingly demanding footprint reporting on product level, and regulators, who, through the Corporate Sustainability Reporting Directive (CSRD), are requiring us to report on our environmental impacts. Doing this manually with Excel spreadsheets is becoming less feasible and reliable, so we needed to automate and digitise our LCA processes to ensure data quality and consistency and enable us to react to changes in leading standards and guidelines and developments in LCA databases – and explain how these affect our footprint calculations.

We started by migrating our LCA database from Excel to a cloud-based platform, to enable us to maintain control over the data and its mapping, while using a coded, secure back end. In the near future, this will also enable us to provide live access to updated central footprint information for raw materials to all our LCA applications. It also reduces the potential for calculation errors and assures the quality of the emissions data and the selection of emissions factors.

Next, Sustainability, IT, Formulation and other teams across the business worked together to integrate the back-end data with our other reporting systems, so that we could use the same level of detail for footprint calculations as we do for other types of reporting. Working on a common sustainability goal helped us to break down silos, share knowledge and improve efficiency. People across Nutreco are motivated by working on sustainability projects, which can have positive spillover effects on other aspects of our business, creating value beyond core sustainability issues.

One technical benefit of smart digital solutions is that they can improve the quality, speed and security of footprint calculation, ensuring that the calculations are accurate and aligned with standards. We have asked Kiwa, an independent third-party certification body and part of the SHV family, to verify our solution, helping us identify our strengths and weaknesses and set our priorities for 2024.

Marcel Görmer
Technical Lead Sustainability Metrics
Nutreco

PwC names Skretting a climate leader in Norway

Among Norway's 100 largest companies, only nine are successfully reducing house gas emissions as mandated, and four of them – Skretting and three salmon producers – are from the aquaculture sector.

PwC's Norwegian Climate Index, an annual overview of the climate impact of large companies, only names entities that meet the Paris Agreement's baseline emission cut requirements – averaging at least 7% annually over the past three years – at the top of their ranking.

Aquaculture industry ranks high in 2023

The report spotlighted Norway's aquaculture industry as having a particularly strong performance. It highlighted three salmon producers, Lerøy, Mowi and SalMar, for reducing emissions by at least 7%. Hanne Løvstad, Partner and Head of Sustainability and Climate Services at PwC, gave Skretting credit for helping the industry achieve its climate objectives, given that feed contributes significantly to salmon's carbon footprint.

"This underscores our recent successes, and it's impressive to witness the aquaculture sector leading Norway's climate efforts," says Leif Kjetil Skjæveland, Sustainability and Public Relations Manager at Skretting Norway. Skretting Norway's climate footprint last year stood at 1.77 CO_2e per kilogram of fish feed produced, a remarkable 46% decrease from the 2018 baseline.

Science-based targets and enhanced sustainability

Håvard Walde, General Manager of Skretting Norway, said this is the result of a collective effort from the entire organisation and was helped significantly by the dedicated sustainability officers across most departments at Skretting Norway and the impact of Nutreco committing early to the SBTi. "We are immensely gratified to receive this affirmation of the effectiveness of our environmental initiatives. Simultaneously, we feel a heightened responsibility to do even more, collaborating with customers and suppliers to drive forward. The recent heatwaves, forest fires, floods, and extreme weather events remind us of the urgent need for climate action. We are committed to ensuring that Norway's aquaculture industry continues to lead in the development of resource-efficient and sustainable food production," said Walde.

The abacus represents the nine climate winners of Norway's 100 largest companies. "The progress is too slow! While 22 out of 100 companies exhibit emission cuts in their operations and value chains, only nine of these align with the Paris Agreement," says Hanne Løvstad, PwC Partner and Head of Sustainability and Climate Services, pictured here with Leif Kjetil Skjæveland (to the right), Manager for Sustainability and Public Relations, who accepted the award on behalf of Skretting Norway.

Skretting Italy is the first Nutreco OpCo to certify MyFeedPrint

> We saw great opportunities in certifying the system used to calculate product CFP instead of the values for a limited range of products. It enables us to provide our customers with certified CFP values for any product, with the flexibility to keep the values updated following any change or optimisation in formulation.

Skretting Italy has upgraded the Carbon Footprint of Products (CFP) Systematic Approach they have used for carbon footprinting since 2020 to the MyFeedPrint system, Nutreco's solution to provide customers with robust and accurate values for product CFP.

The upgrade to MyFeedPrint is the last step of a journey the team started in 2020 with the adoption of the CFP Systematic Approach. They were able to get this approach certified to ISO 14067, a leading ISO standard for carbon footprinting, in 2021. Then, earlier this year, they achieved full alignment with MyFeedPrint.

Umberto Luzzana
Marketing Manager
Skretting Italy

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Chapter 3
Good citizenship

Good citizenship

This pillar of RoadMap 2025 is primarily focused on diversity and inclusion (D&I), which we strive towards by empowering local communities with best practices and technology to ensure that aquaculture offers a sustainable path to healthy living. In addition, we work to be a diverse and inclusive employer, aiming for our teams to reflect the diverse and global society we live and work in, and to be the change we want to see.

We want everyone to thrive in an environment where we feel valued and respected, in a culture that brings out the best in all of us. To help us succeed in Feeding the Future, we welcome everyone as valued members of our family, with equal opportunities to be the best we can. We respect people for who they are and embrace diversity, listening to and learning from each other's unique perspectives.

Our targets	Our 2023 progress
One out of three hires are female	20% of our hires were female
30% women in senior leadership by 2025	27% women in leadership
Implement the Taking the Stage programme	23 Skretting women leaders took part in Taking the Stage

● Not on target ● In progress ● On track

Progress towards our goals

During 2023, we continued to focus on our three key D&I areas:

Balanced gender representation: Our goal is to have 30% representation of women in leadership positions by 2025. We are currently at 27%, which means we will need to accelerate this progress to reach our ambition. We have specific recruitment targets aimed at improving female representation and we review them as part of our internal reporting and audit process. We also put special focus on improving gender representation in our talent pipeline.

During 2023, the number of nationalities represented across our Skretting business reached 77 and the average age of our employees was 39.3.

Skretting's total number of employees

Business unit	Number of employees	% Female hired	% Female in senior leadership	Number of nationalities	Average age
Salmon	979	19	23	37	42
LatAm	927	14	29	10	36.5
Southern Europe	407	31	21	17	43.5
Asia	1,633	20	25	23	38.5
MEA	517	27	17	30	38.5
Corporate	147	38	46	30	41.6
Global	4,610	20	27	77	39.3

The Norwegian Transparency Act mandates full disclosure of social risks in the value chain

Norwegian legislation has put a special focus on human and workers' rights across Norwegian companies' complete value chain. This sparked a thorough due diligence around key goods and services sourced for Norwegian aquaculture and other industries.

The Norwegian Transparency Act mandates that large Norwegian companies must carry out and report on due diligence assessments of their complete supply chain and own operations in relation to human rights and workers' rights. In 2023, Skretting Norway was required for the first time to publicly file a report covering how the due diligence was carried out, what the findings were and how to mitigate the identified risks.

A complex value chain that may be exposed to violations

Skretting Norway, like the other Nutreco businesses, has long demanded that our suppliers must follow the requirements set out in our Code of Conduct for Business Partners. But the new legislation demands continuous monitoring more deeply into our value chain.

Most of Skretting Norway's raw materials are imported from abroad; the value chain is complex and includes raw materials that may be exposed to violations of human and workers' rights, as well as the risks of negative impact on people, animals and the environment.

"When our producers can be anything from large international companies to small-scale farmers and fishermen, it is difficult to capture every deviation and breach. This is something we must continue to work on, to ensure we continue to make real improvements for people in our own business and supply chain," says Leif Kjetil Skjæveland, Sustainability and Public Relations Manager at Skretting Norway.

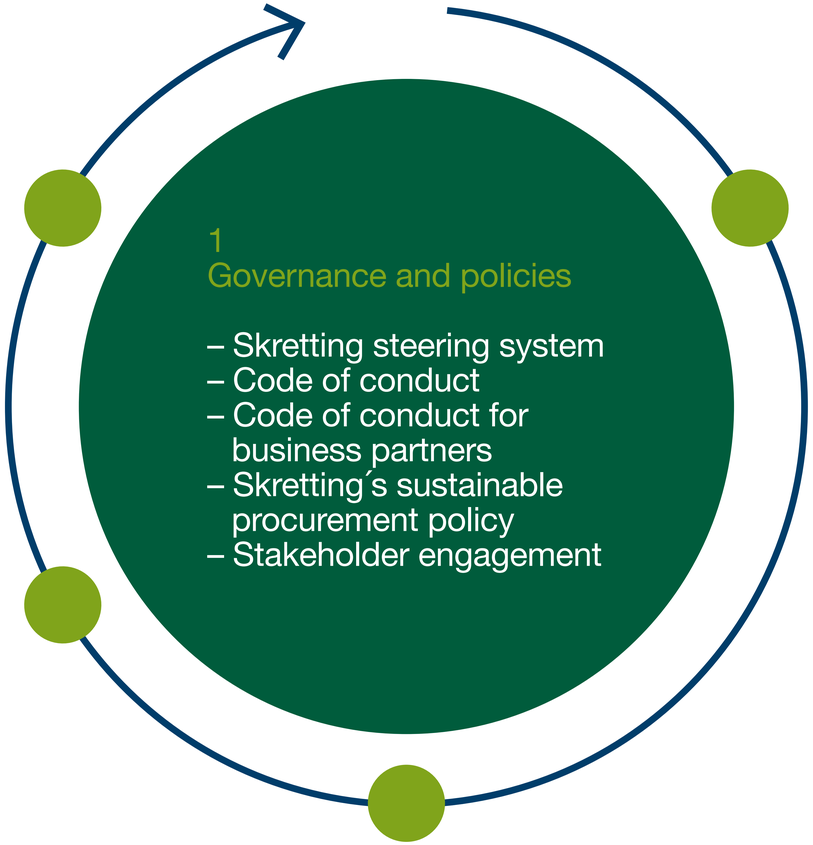
A total of 16 suppliers flagged as high risk

During the 2023 risk assessment, we have improved our risk assessment and found that 16 of the assessed suppliers were flagged as high risk, mainly because they operate in countries or industries – such as the agricultural and fisheries sectors – that are typically designated as high risk. Since Skretting's largest purchases consist of vegetable and marine raw materials, it was expected that some of the suppliers and their value chain would be flagged as high risk.

"So far, we have evaluated four of the 16 suppliers in the high risk group, and they scored satisfactorily. We are currently actively checking three other suppliers and will follow up with the remaining nine shortly. We have seen good cooperation from our suppliers so far and expect the same with our remaining high-risk business partners moving forward," says Job van Mil, Nutreco's Supplier Sustainability Manager, who leads the due diligence.

Skretting Norway´s approach to human rights and working conditions

Skretting's work with human rights and working conditions uses the OECD's model and its six recommended steps for due diligence assessments for a responsible business community.



2
Impact identification
We assess adverse impacts through human rights impact assessments, integrity due diligence (IDD) checks, and risk assessment of suppliers, manufactors and raw materials.

6
Remediation
Negative impacts are remediated as far as reasonably possible, given our level of impact and influence.

3
Mitigation of impacts
We mitigate potential and actual adverse impacts through appropriate measures.

4
Monitoring
We track implementations measures and results.

5
Communicating outcomes
We communicate how impacts are adressed in our sustainbility reporting and on our website.

Spend risk per category	High	Medium	Low	Unknown
Norway	73%	23%	3%	1%

Cleaning plastics from the oceans

It is estimated that eight million tons of plastic pollution enters the oceans every year, and that marine plastic pollution costs up to $2.5 trillion per year, globally. Plastic in the oceans can take up to 450 years to degrade, it absorbs and transports chemical pollutants and it can cause toxic effects when digested by animals.

With the aim to promote actions that reduce plastic pollution in the ocean, and as part of SeaBOS's transformation efforts for a healthy ocean, Skretting participated in a coastal clean-up for marine plastics. This initiative helped remove some plastics while, at the same time, highlighting the challenges that ocean plastics present for the marine environment, and showing that individual actions can have impact. Nearly 250 colleagues in Norway, Australia, Chile, Canada, Vietnam, Indonesia, Italy and Japan joined the initiative and collected approximately 1,400 kilograms of waste – more than two times the amount collected in 2021!

In addition, our teams in Indonesia have participated in community projects, starting in 2022 and continuing through 2023, to clean up local coastlines and plant mangrove trees. Mangrove forests are highly effective at sequestering and storing carbon dioxide from the atmosphere and serve as incredibly biodiverse ecosystems that support a wide range of plant and animal species.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Chapter 4
Ingredient deep dive

Feed ingredients

Finding the most sustainable and cost-efficient raw materials

The production of fish and shrimp feed is very complex, with strict criteria regulating the physical quality of the pellets, and sophisticated equipment needed to process the feed. One of the biggest cost drivers in feed production is raw material procurement. For this reason, we devote a lot of our research to increasing raw material flexibility and functionality. We produce more than three million tons of feed each year, which means that even small improvements in product technology can add up to big improvements in quality, efficiency and sustainability.

Our targets	Our 2023 progress
Obtain 100% of marine ingredients from sources audited and certified by MarinTrust or MSC, or engaged in an FIP	77% of our whole fish and trimmings are certified MarinTrust or MSC or from an FIP, a decrease compared to the 84% reported in 2022 (reflections and reasons for this decline are shared later in this chapter).
Ensure all purchased soy is deforestation-free by 2025	92% of our purchased soy is in class A or B according to our sourcing policy, with a significant decrease in uncertified, high-risk products.
Ensure that by 2022, all agricultural vegetable products are traced back to the country where they were cultivated, to use in a risk filter and for footprinting requirements	We have traceability for soy and palm ingredients to the country where they are cultivated. Unfortunately, we have not yet successfully implemented a traceability system for other vegetable ingredients, due to the complexity of supply chains and the significant increase in administration that comes with it, both for us and our suppliers. This is a task that we will explore further in 2024.
5-10% of feed ingredients come from alternative novel sources	We reached 0.99% in Skretting, an increase compared to the 0.79% in 2022, but still far from our target.

Not on target · In progress · On track

Progress on the composition of feed

> The blueprint we have developed to screen raw materials and understand what every ingredient brings to the table and how to handle them helps us make the right choices going forward.

Samuel Eggington
Global Formulation Manager
Skretting

In our 2022 Sustainability Report, we detailed how we have been adapting to the most recent challenges in raw material availability and price caused by a combination of global events, many of which are still ongoing and beyond our control. This has only increased our focus on finding alternative ingredients to ensure a continued supply of high-quality feeds as cost effectively as possible. While every year comes with improvements and developments, it is important to look back and see just how far we have come in terms of expanding our raw material basket.

Three decades ago, fish feeds commonly comprised just three ingredients: fish meal, fish oil and wheat. These were, and remain, nutritionally valuable ingredients. However, if this diet composition was still the same today, we would be totally exposed to the volatility of the marine market, which can see availability plummet and prices spike when environmental conditions change, for example, during the El Niño climate pattern of 2023 and 2024. More importantly, we have a responsibility to protect wild marine stocks for future generations. So, the journey began to look for alternatives.

The early 1990s saw major breakthroughs in salmon feed, with the successful introduction of corn, wheat and soy-based proteins. This was closely followed by the first use of land animal protein sources and vegetable-based oils, the latter allowing us to start reducing fish oil as well as protein. Equally important was the introduction of micro ingredients such as amino acids, vitamins and minerals. Here, small inclusions of these much more concentrated sources can result in significant reductions in the need for materials such as fish meal.

Through decades of trials evaluating new raw materials to understand aspects such as acceptability, digestibility, maximum doses and functional properties, we have been able to expand our raw material basket. Today, individual feeds regularly include 20-30 different ingredients, many of which are combinations of interchangeable protein, starch and oil sources, allowing for endless combinations for the best balance in price, availability and quality at any given time.

We have made huge leaps, such as applying research to translate the nutritional composition of marine proteins and oils into actual nutrient requirements for fish and shrimp, allowing us to produce diets today that contain zero fishmeal and oil for some species. We have also taken smaller steps, such as testing the digestibility of over 60 protein sources, covering different specifications, temperatures, target species, suppliers and production methods, to understand how to effectively replace one protein with another when the price or availability becomes less favourable. There have also been some forced learnings along the way, highlighting the importance of combining our knowledge of macro and micro ingredients with our understanding of the nutrient requirements of fish. A perfect example is when blood meal products were removed from diets in the mid-1990s following concerns around the BSE (“mad cow disease”) outbreak, resulting in a large increase in the incidences of cataracts in Atlantic salmon. From this, we learned the important function of the amino acid histidine and were able to add this directly to feeds to mitigate the problem in the future.

Beyond knowing how ingredients work nutritionally, we have also had to learn how they work in terms of processing and handling. The introduction of the extrusion process for aquafeed has been industry changing and is now standard practice for some species and increasingly important in others. This allows us to handle a much wider range of raw materials. Additionally, the push for high-energy feeds has given us years of experience in dealing with how to cope with high levels of a variety of oil sources, right from production to onsite storage.

Over time, a range of ingredients have become well-established staples in our feeds. However, at the same time, new micro and macro ingredients have appeared on the horizon and will continue to do so. The blueprint we have developed to screen raw materials and understand what every ingredient brings to the table and how to handle them helps us make the right choices going forward.

Inclusion of different nutrients in Skretting feed

[1] The use of land animal by-products will depend upon market acceptance and legislation.
[2] The level of starch raw materials will be different in extruded and pelleted feed.

	Primary raw material	Ingredient group	Typical examples	Salmon	Sea bass and sea breem	Shrimp[2]	Tilapia	Average Skretting
				average% inclusion in feed				
Protein	Wild capture and farmed fish and crustaceans	Marine proteins	Fish meal Crustacean meal	12.5	17.8	10.2	1.7	11.9
	By-products from farmed land animals	Land animal proteins[1]	Poultry meal	10.0	19.2	4.9	9.1	9.2
	Agricultural crops	Vegetable proteins	Wheat gluten, Corn gluten Soybean Meal, Soy protein concentrate, Rapeseed meal Sunflower meal, Lupin, Faba	36.2	30.5	45.4	38.4	37.9
Fat	Wild capture, algae, farmed fish and crustaceans	Fish oil Algal oil	Fish oil Algal oil	10.3	7.9	1.4	0.2	5.5
	Agricultural crops	Vegetable oils	Rapeseed oil Soybean oil Camelina oil	19.7	5.7	2.5	0.2	9.1
	By-products from farmed land animals	Land animal oils[1]	Poultry oil	0.9				0.7
Carbohydrates	Agricultural crops	Starch raw materials	Wheat	7.5	16.9	28.6	44.4	18.7
Micronutrients		Vitamins Minerals Pigments	Vitamin Premixes Mineral Premixes Pigments	2.9	2.0	7.0	6.0	7.0

Reflections from Nutreco's new Sustainability Director

In 2023, we have made our sustainability actions more transparent and more action oriented and have been able to really increase the number of people in the organisation involved in sustainability, through three main focus areas:

Robert van den Breemer
Sustainability and Procurement Director
Nutreco

Being open and transparent:

- Delivering on the Corporate Sustainability Reporting Directive (CSRD); defining our material topics, the required reporting and the necessary governance, policies and KPIs.
- Starting to think about the EU Deforestation Regulation (EUDR), the impact of the required administration and the potential impact on our procurement of raw materials. Concrete action will need to take place on this in 2024.

Acting NOW:

- Especially when it comes to carbon footprints, actual reduction hasn't been the key focus in the past, with measuring and reporting at the forefront of our attention – but this has changed in 2023. We have developed clear action plans for scope 1 and 2 and set KPIs per business. This improved measurement of energy use sets Skretting up for structural footprint reduction in the coming years.
- On scope 3, our understanding of the origins of our carbon footprint has improved. We have found that around 40% is with Tier-1 suppliers, approximately 50% is related to non-FLAG (e.g., fossil fuel) emissions in our value chain and around 33% relates to land use change (e.g., deforestation and conversion) emissions. Yet we are still developing a clear action plan that is financially viable, and have not found many clear short-term actions that would make reductions possible. We are engaged in several value chain initiatives, but we are not yet satisfied with the scope and speed of progress.

Empowering our colleagues and stakeholders

- The community of people within Nutreco actively involved in helping us achieve our sustainability agenda is growing. Clearly our purpose of Feeding the Future has meaning for people – and they also want to give it meaning themselves. As a sustainability team, we help them do this through webinars and trainings.

All in all, 2023 has been a year during which we have really made a step up in our actions. Although we don't see this back in all of our KPIs, we hope to see it reflected in our results in 2024.

Supplier sustainability: Progress in 2023

At Skretting, supplier sustainability is a fundamental pillar of our commitment to driving positive change within the aquaculture industry. We recognise that our suppliers play a crucial role in facilitating the production of sustainable seafood, and we are dedicated to using our position in the supply chain to drive continuous improvement.

To assess and monitor the sustainability performance of our suppliers, we have partnered with EcoVadis, a globally recognised sustainability rating platform. EcoVadis assesses suppliers based on four key categories: environment, labour and human rights, ethics and sustainable procurement.

By utilising EcoVadis, we gain valuable insights into our suppliers' sustainability practices and can benchmark their performance against industry standards. This enables us to identify areas for improvement and drive positive change throughout our supply chains.

Percentage of spend classified by risk categories per BU.

* For "in progress" suppliers, we are still working to align the risk assessment with the correct entities.

Risk assessment	Low risk	Medium risk	High risk	In progress*
Asia	3%	43%	12%	41%
LatAm	1%	59%	15%	25%
MEA	3%	50%	4%	42%
Salmon	3%	30%	59%	8%
Southern Europe	5%	61%	18%	16%
Total	3%	41%	39%	17%

We prioritise engagement with high-risk suppliers, who are operating in regions or industries where sustainability risks are more prevalent. We are requesting that these high-risk suppliers perform an EcoVadis Ratings questionnaire, to show which steps they are taking to mitigate any risks found during the risk assessment.

Overall, EcoVadis Ratings enabled us to prioritise high-risk suppliers, to gain insights into their sustainability performance and drive continuous improvement throughout their supply chains. By utilising this platform, we can strengthen our commitment to sustainability and make more informed decisions on sustainable suppliers.

We are also excited to share that our parent company, Nutreco, has been honoured with the prestigious Silver Medal for Sustainability Performance by EcoVadis. This accolade showcases Nutreco's dedication to making a positive environmental and societal impact. By receiving this award, we demonstrate not only our demand for transparency from suppliers but also our own commitment to sustainable practices. Winning the EcoVadis Silver award recognises our ongoing efforts and solidifies our position as a responsible and sustainable business.

Due diligence engagement across our supply chain

	Rating performed	% of high risk
Asia	12%	1%
LatAm	32%	0%
MEA	17%	24%
Salmon	13%	13%
Southern Europe	4%	2%
Total	16%	11%

Job van Mil
Supplier Sustainability Manager
Nutreco

Soy Ingredients

Our approach and progress

Soy production is a cornerstone of many parts of our global food production system, including aquaculture feed. Unfortunately, soy is also known to drive deforestation, which leads to negative impacts on climate and biodiversity. Deforestation-free soy is crucial for tackling climate change and protecting our planet's ecosystems. By promoting sustainable practices and choosing deforestation-free soy, we can mitigate environmental damage, preserve carbon sinks and safeguard endangered species. At Skretting, we feel it is our collective responsibility to demand and support deforestation-free soy to create a sustainable future for generations to come.

The Nutreco Soy and Oil Palm Sourcing Policy is a set of guidelines to ensure that all Nutreco companies, including Skretting, source these ingredients responsibly, without contributing to deforestation. It categorises ingredients based on the deforestation risk associated with the country where the soy is cultivated and promotes the use of adequate certification in the case of high deforestation risks.

To ensure transparency and accountability, our policy categorises soy and palm ingredients into four distinct classes based on their deforestation risks. By identifying these risks, we can better understand the steps needed to mitigate them. It also provides clear guidelines on which sustainability certificates can be utilised to safeguard our supply chains.

We are encouraged by the European Union's proactive stance on deforestation. Their ruling, set to take effect in 2025, mandates due diligence on select imported commodities, including soy. This will undoubtedly push the industry towards the creation of 100%-traceable, deforestation-free supply chains. Our hope is that these sustainable supply chains will not only benefit our EU-based companies but also extend to our global operations.

We have taken proactive measures to support farmers who prioritise deforestation-free practices. In 2023, 8% of our total soy purchases were untraceable or originated from high-risk regions without any certification, falling short of our sourcing policy's goals. Despite this shortfall, we are proud to report that 92% of our soy purchases in 2023 were compliant with our intermediate goals, showcasing a significant decrease in uncertified, high-risk products.

Creating a deforestation-free supply chain isn't easy, and cannot be done without our supply chain partners, but we're determined to overcome challenges. We're fully committed to making a lasting impact on our environment and securing a better future for generations to come.

Skretting's purchases of soy according to our Sourcing Policy

	Class A	Class B	Class C	Class D	Unknown origin
Asia	36%	38%	3%	23%	0%
LatAm	57%	39%	0%	4%	0%
MEA	55%	0%	0%	0%	0%
Salmon	74%	26%	0%	0%	0%
Southern Europe	57%	19%	0%	4%	1%
Total	58%	34%	0%	7%	1%

Sustainability claims per class

Class A	Nutreco's soy and oil palm ingredients are deforestation-free.
Class B	Nutreco supports the production of deforestation-free feed ingredients from soy and oil palm.
Class C	The soy ingredient meets the FEFAC soy sourcing guidelines, e.g., no illegal deforestation has occurred. In this defined class, there are no acceptable programmes for oil palm ingredients, therefore no claims can be made.
Class D	The soy and ingredient(s) can be traced back to their country-of-cultivation.

Reflections from soy supplier Bunge

At Bunge, we believe that the future of the agriculture industry is about supporting decarbonisation by embracing low-carbon solutions. That is why we strive to be the preferred sustainable solutions partner in oilseeds, related commodities and ingredients for both farmers and customers.

The urgent need for decarbonisation is opening new market opportunities for low-carbon-intensity solutions and is placing agriculture at the centre. We are working to empower farmers to take advantage of this growing market while helping our customers to meet their own sustainability commitments.

One of the ways we do this is through our regenerative agriculture programme. Today, we are mapping existing practices taking place on farms, working collaboratively to identify corrective or additional measures, and providing support for their implementation, including financial incentives. We believe the transformation that is needed for a decarbonised future is only possible when we act together.

We also recognise the relevance of certifications to provide additional assurances to our customers. Indeed, we are one of the largest providers of non-deforestation certified soybeans in the world. Our broad certification portfolio includes Proterra, an important standard for the aquaculture sector. For this sector, we also coordinated the Taskforce on Nature-related Financial Disclosures (TNFD) guidance, together with the food and agriculture approach, supporting transparency and accountability when it comes to nature.

Our commitment to deforestation- and conversion-free supply chains is also a crucial driver of our own science-based greenhouse gas emissions goals. It is anchored by a leading origination footprint and strong relationships with farmers. It also leverages our reference scores on traceability and monitoring system of direct and indirect grain sources in areas facing a higher risk of deforestation in South America, covering more than 16 thousand farms across nearly 20 million hectares. We are well positioned to connect sustainable products to the markets where the demand for them is increasing.

Michel Santos
Sr. Director, Global Sustainability
Bunge

Marine ingredients

Fishmeal and fish oil originating from the different FAO fishing areas

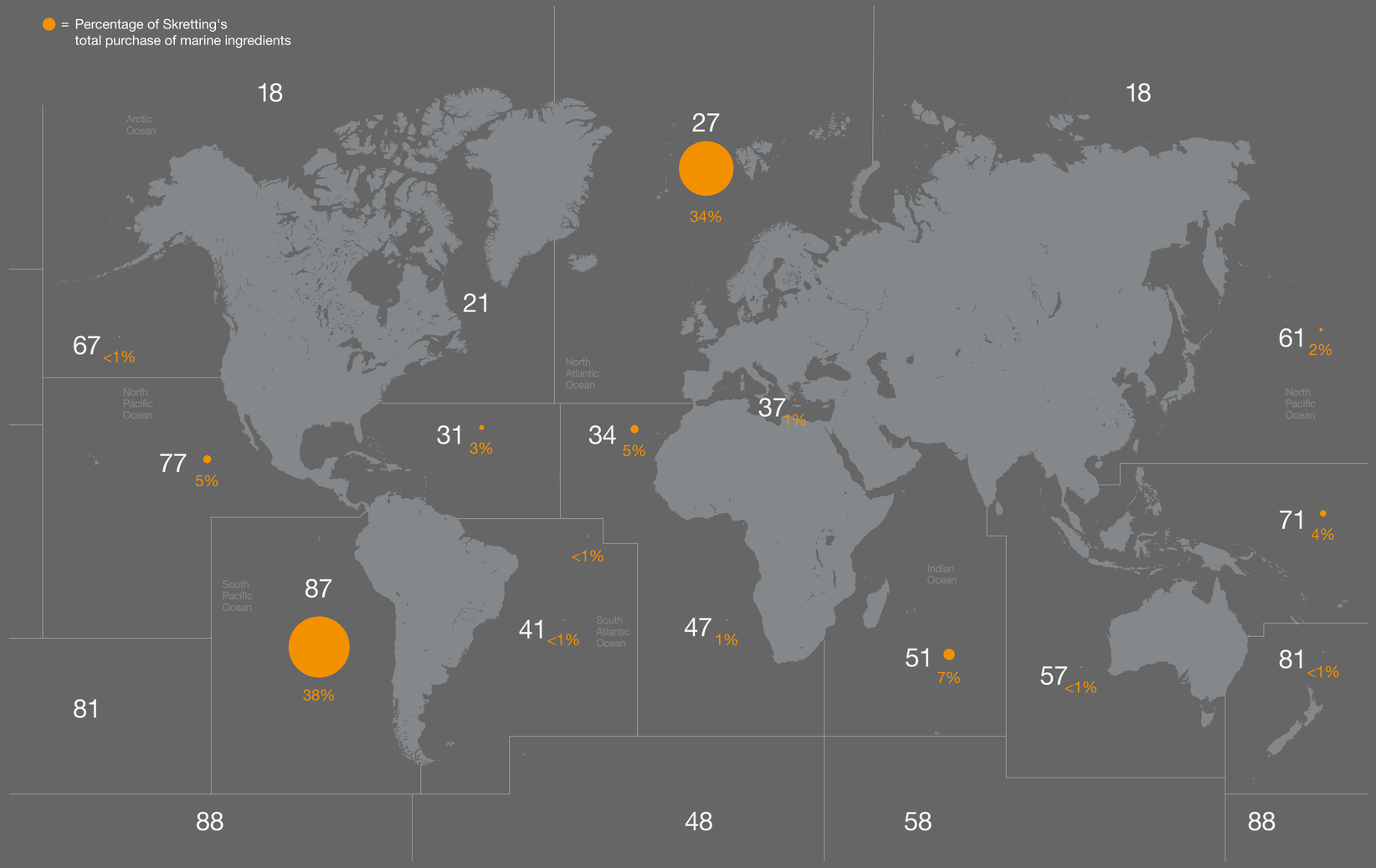
The Food and Agriculture Organization (FAO) has identified several main fishing areas around the world (listed in table), divided into statistical areas and sub-areas for the purpose of data collection and management. These main fishing areas cover a large portion of the world's oceans and are important for global fisheries' management and conservation efforts.

The most important fishing areas for Skretting based on origin of marine ingredients are:

- Pacific Southeast (38%), which includes countries such as Ecuador, Peru and Chile
- Atlantic Northeast (34%), which includes countries such as Iceland, Norway, UK and many EU countries

Other important areas are:

- Western Indian Ocean, which includes countries such as India, Oman and Mauritius
- Pacific, Eastern Central, which includes the Pacific coast of Latin America and Atlantic, Western Central, which represents countries in Northwest Africa, such as Mauritania and Morocco



FAO fishing area	Code	%						
Pacific, Southeast	87	38%	Atlantic, Southeast	47	1%	Atlantic, Antarctic	48	-
Atlantic, Northeast	27	34%	Mediterranean and Black Sea	37	1%	Indian Ocean, Antarctic	58	-
Indian Ocean, Western	51	7%	Indian Ocean, Eastern	57	<1%	Pacific, Antarctic	88	-
Pacific, Eastern Central	77	5%	Pacific, Northeast	67	<1%	Arctic Sea	18	-
Atlantic, Western Central	31	3%	Atlantic, Southwest	41	<1%	Atlantic, Northwest	21	-
Pacific, Northwest	61	2%	Pacific, Southwest	81	<1%			

Fisheries of origin for whole fish

A total of 25 species made up 95% of Skretting's purchases of marine ingredients in 2023 originating from whole fish. The most important species are small pelagic fishes from the Pacific Southeast, Atlantic Northeast and Atlantic Eastern Central fishing areas. Small pelagic fisheries are the most important source for both fishmeal and fish oil.

The remaining 5% originates from an additional 49 species. There are several reasons for the relatively large number of species registered. In all fisheries, there will be a certain amount of by-catch. When the by-catch is at low levels it will be part of the legal fishery. In some areas, the manufacturers of marine ingredients are instructed by law to register all by-catch. This means that when Skretting receives a consignment of marine ingredients, more than 10 species will be declared that might only constitute a few percentages of the delivery.

Another factor is that many fisheries are multi-species fisheries, especially in more tropical areas where we find large species diversity and where single-species fisheries are not common.

It can also be a challenge to identify all fisheries in a detailed and correct way. Our suppliers often can declare that the origin of a marine ingredient is anchovy or sardine. However, there are many different anchovy and sardine species, which can make it challenging to identify the specific fishery. This is something we want to address through new pilot initiatives, including our engagement with the Global Dialogue on Seafood Traceability (GDST).

Overview of origin of marine ingredients from whole fish

Species	Latin name	Fishmeal	Fish oil	FAO fishing area
Blue whiting	*Micromesistius poutassou*	15.9%	3.7%	27
Sardine	*Sardinella spp*	12.9%	17.2%	87, 51, 61, 34, 77, 31, 34, 47, 57
Anchovy	*Engraulidae ssp*	10.5%	9.5%	87, 61, 34, 31,77, 47, 57, 37, 51
Peruvian anchoveta	*Engraulis ringens*	9.0%	5.9%	87
Chub mackerel	*Scomber japonicus*	7.4%	4.1%	87
Baltic sprat	*Sprattus sprattus*		3.6%	27
Sprat	*Sprattus sprattus*	6.3%	5.2%	27
Largehead hairtail	*Trichiurus lepturus*	4.5%		87
Sandeel	*Ammodytes tobianus*	4.0%	2.4%	27
Shortfin scad	*Decapterus macrosoma*	2.6%		87
Atlantic salmon	*Salmo salar*		3.7%	Farmed
Krill	*Euphausiacea spp*	2.5%		58, 88, 48
Gulf menhaden	*Brevoortia patronus*		0.7%	31
Menhaden	*Brevoortia spp*	2.4%		31
Herring	*Clupea spp*	2.2%	7.5%	27
Pacific anchoveta	*Cetengraulis mysticetus*	2.0%	3.3%	87
Pacific thread herring	*Opisthonema libertate*	1.7%	2.3%	87
Capelin	*Mallotus villosus*	1.6%	2.3%	27
Jackmackerel	*Trachurus symmetricus*	1.4%	2.4%	87
Araucanian herring	*Strangomera bentincki*	1.3%	6.0%	87
European pilchard	*Sardina pilchardus*	1.2%		34
North Sea herring	*Clupea harengus*	1.2%	0.9%	27
Common searobin	*Prionotus carolinus*	1.1%		87
Other		1.0%	12.2%	
Frigate tuna	*Auxis thazard*	0.9%		87, 34
Norway pout	*Trisopterus esmarkii*	0.9%	0.9%	27
Mackerel	*Scombridae spp*	0.8%	2.7%	27
Boarfish	*Capros aper*	0.6%		27
Miscellaneous		4.2%	3.6%	

Fisheries of origin for by-products (trimmings)

A total of 38 species made up 95% of Skretting's purchases of marine ingredients in 2023 originating from by-products (trimmings). In addition, 24 more species of fish are registered as the origin of fishmeal and fish oil from by-products (trimmings), but then in low volumes (< 5%). Marine ingredients from different tuna species are common, due to the tuna canning industry.

The species registered as origin of marine ingredients from trimmings reflect fisheries important in human consumption. Hake, cod, pollock and different mackerel species are all important. We also see trimmings from small pelagic fishes including anchovy, sardines and sprat. Marine ingredients from farmed species such as Atlantic salmon are also becoming important. In 2023, Atlantic salmon was the most important source of fish oil originating from trimmings.

We cannot establish with 100% certainty the FAO fishing area for these species because the country of processing (country of origin) might be different from where the original catch was landed.

Overview of marine ingredients from trimmings (by-products)

Species	Latin name	Fishmeal	Fish oil	FAO fishing area
Blue whiting	*Micromesistius poutassou*	15.89%		27
Sardine	*Sardinella spp*	12.9%	17.2%	87, 51, 61, 34, 77, 31, 34, 47, 57
Anchovy	*Engraulidae ssp*	10.5%	9.5%	87, 61, 34, 31,77, 47, 57, 37, 51
Peruvian anchoveta	*Engraulis ringens*	9.0%	5.9%	87
Chub mackerel	*Scomber japonicus*	7.4%	4.1%	87
Sprat	*Sprattus sprattus*		3.6%	27
Largehead hairtail	*Trichiurus lepturus*	4.51%		87
Sandeel	*Ammodytes tobianus*	3.99%		27
Shortfin scad	*Decapterus macrosoma*	2.58%	0.65%	87
Krill	*Euphausiacea spp*	2.48%		58, 88, 48
Menhaden	*Brevoortia spp*	2.44%		31
Herring	*Clupea spp*	2.15%	16.85%	27
Pacific anchoveta	*Cetengraulis mysticetus*	2.03%		87
Pacific thread herring	*Opisthonema libertate*	1.71%		87
Capelin	*Mallotus villosus*	1.62%	1.82%	27
Jackmackerel	*Trachurus symmetricus*	1.45%	8.05%	87
Araucanian herring	*Strangomera bentincki*	1.27%		87
European pilchard	*Sardina pilchardus*	1.25%	0.59%	34
North Sea herring	*Clupea harengus*	1.18%	2.28%	27
Common searobin	*Prionotus carolinus*	1.07%		87
Other		0.97%	5.56%	
Frigate tuna	*Auxis thazard*	0.87%		87, 34
Albacore	*Thunnus alalunga*		0.47%	
Norway pout	*Trisopterus esmarkii*	0.85%		27
Mackerel	*Scombridae spp*	0.77%	13.66%	27
Boarfish	*Capros aper*	0.65%		27
Atlantic salmon	*Salmo salar*		16.05%	Farmed
Baltic sprat	*Sprattus sprattus*		0.65%	
Capelin	*Mallotus villosus*		1.82%	27
Catfish	*Silurus spp*		0.73%	27
Cod	*Cod Gadus morhua*		1.84%	27
Coho salmon	*Oncorhynchus kisutch*		2.73%	
European pilchard	*Sardina pilchardus*		0.59%	
Pollock	*Pollachius virens*		2.65%	27
Rainbow trout	*Oncorhynchus mykiss*		1.78%	Farmed
Yellowfin tuna	*Thunnus albacares*		4.00%	
Tuna	*Thunnini spp*		0.57%	
Miscellaneous		4.19%	5.23%	

Disclosure of forage fish dependency ratio (FFDR)

Fishmeal and fish oil from wild fish are both finite resources that are shared across a range of users with increasing demands, from direct human consumption to aquaculture to pig and poultry production. We promote the efficient use of these resources, producing increasing amounts of farmed fish and crustacean from a given input of fishmeal and fish oil.

The use of wild fish in aquaculture is commonly expressed as the FFDR. It is calculated based on the use of fishmeal and fish oil originating from wild fish. Marine ingredients originating from trimmings are not considered. The FFDR is the amount of wild-caught fish used to produce the amounts of fishmeal and fish oil required to produce one kilogram of farmed fish.

The exact FFDR will be dependent on the amount of marine ingredients in the feed, the amount of marine ingredients originating from trimmings and the economic feed conversion factor (FCRe).

We have also included the calculation of fish in fish out (FIFO) as defined by Jackson (2009). Jackson argues that the FIFO calculation gives a more accurate number when taking into account the total usage of fishmeal and fish oil.

Estimated global FFDR averages for Atlantic salmon, sea bass and sea bream, shrimp and tilapia

Skretting global averages	Salmon			Sea bass and sea bream			Shrimp				Tilapia		
Year	2021	2022	2023	2021	2022	2023	2021	2022	2023 Asia	2023 LatAm	2021	2022	2023
Forage fish dependency ratio: Fishmeal (FFDRm)	0.37	0.40	0.38	0.46	0.54	0.46	0.23	0.24	0.4	0.23	0.04	0.01	0.03
Forage fish dependency ratio: Fish oil (FFDRo)	1.46	0.40	1.59	0.54	0.19	0.71	0.03	0.00	0.0	0.25	0.05	0.00	0.01
Global FCRe	1.3	1.3	1.3	1.8	1.8	1.8	1.5	1.5	1.5	1.5	2.0	2.0	2.0
FFDRm fish	0.48	0.52	0.49	0.81	0.95	0.81	0.35	0.36	0.65	0.35	0.08	0.02	0.06
FFDRo fish	1.90	1.82	2.06	0.94	0.32	1.24	0.05	0.00	0.00	0.38	0.10	0.00	0.02
FIFO	0.56	0.58	0.58	0.47	0.48	0.50	0.04	0.04	0.03	0.21	0.20	0.23	0.36

Estimated averages for FFDR for Atlantic salmon farmed in Norway and Chile

Country specific averages Atlantic salmon	Norway Feed			Norway Salmon		Chile Feed			Chile Salmon	
	FFDR Meal	FFDR Oil	FCRe	FFDR Meal	FFDR Oil	FFDR Meal	FFDR Oil	FCRe	FFDR Meal	FFDR Oil
2023	0.51	1.03	1.30	0.66	1.34	0.25	1.56	1.30	0.33	2.03
2022	0.42	0.96	1.30	0.55	1.25	0.26	1.48	1.30	0.34	1.92
2021	0.43	1.09	1.30	0.56	1.42	0.25	1.46	1.30	0.33	1.90
2020	0.44	1.39	1.30	0.57	1.81	0.19	1.57	1.30	0.25	2.04
2019	0.35	1.52	1.30	0.46	1.98	0.27	1.46	1.30	0.35	1.90
2018	0.42	1.24	1.30	0.55	1.61	0.34	1.41	1.30	0.44	1.83

Calculation:

FFDRm = (forage fishmeal in feed % * eFCR) / 24%
FFDRo = (forage fish oil in feed % * eFCR) / 5%
FIFO Ratio = (forage fishmeal in feed % + forage fish oil in feed %)/ (Yield of fishmeal from wild fish + Yield of fish oil from wild fish) * eFCR

Status of marine ingredients: challenges and opportunities

Our ambition is to ensure that, by 2025, all fishmeal and fish oil we use originates from fisheries that are managed according to the FAO Code of Conduct for Responsible Fisheries.

This means that our suppliers must be able to demonstrate that the fishmeal and fish oil is certified according to the Marine Stewardship Council (MSC) or MarinTrust standards or be participating in an FIP with the aim of achieving certification.

In addition to the progress we communicate about in our sustainability reports, and aiming to bring more transparency, Skretting commits to publish the origin and environmental sustainability of wild-caught and farmed seafood sourced by our global operations through the Ocean Disclosure Project.

MSC-certified material has the highest share in the salmon-producing countries, while MarinTrust-certified material is the most important in all regions and constitutes nearly half of all certified material. Material from FIPs is most important in the salmon segment and in Asia and Africa. Please note that the number for certification details cannot be directly compared with Skretting's previous year's reporting; the numbers used in this Impact Report are the percentages of total material of marine ingredients, while in previous reports we used percentages within each certification category.

Skretting's salmon-producing countries have the highest share of certified marine ingredients and have seen an increase in certified materials compared to 2022, in line with increasing customer demands. This segment is also influenced by feed certification standards, which demand a high share of certified marine ingredients.

Latin America showed a significant decrease in the amount of certified material because of great sourcing challenges in Q1 20233, due to supply and commercial conditions. Southern Europe also showed a slight decrease.

Both Asia and Africa increased the amount of certified material they use. It should be noted that Africa produces feed for tilapia, which already has very low inclusion levels of marine ingredients.

For Skretting in total, we see a decrease in certified material compared to 2022. This is mainly due to the conditions in Latin America, as this feed segment represents relatively large feed volumes and impact for Skretting in total. In addition, we see several challenges in increasing the amount of certified material:

- Several fisheries have lost their certification.
- Few fisheries are entering FIPs with the ambition of being certified.
- Existing FIPs could potentially not reach certification and be delisted as improvement projects.
- The fishing quota in Peru led to a lower amount of certified ingredients.
- Market conditions and the historically high cost of fish oil in 2023 had an impact on the total cost of feed and, therefore, on farming operations. We see this as a dilemma and recognise that the only way to move further on our sustainability ambition is through value chain collaboration and commitment, ensuring that the costs can be absorbed and shared across different players (suppliers, feed producers, farmers and retailers) as no one single player can absorb these costs on its own.

Overview of certification status (%) of marine ingredients in Skretting

Certified or in an FIP	Skretting total	BU Salmon	BU Southern Europe	BU Asia	BU Latin America	BU MEA
Total	77	91	73	67	63	78
Whole fish	52	70	39	24	41	20
Trimmings	25	21	34	43	22	58

Certification details (of total)

MSC certified						
Total	14	28	3	2	<1	6
Whole fish	9	18	3	2	<1	2
Trimmings	5	10	<1	<1		4
MarinTrust certified						
Total	44	44	65	43	35	73
Whole fish	25	33	33	11	14	18
Trimmings	19	11	32	32	21	55
MarinTrust FIP						
Total	17	16	4	22	23	
Whole fish	16	16	3	12	23	
Trimmings	1	<1	2	10	<1	
Comprehensive FIP[1]						
Total	3	2	<1	<1	5	
Whole fish	2	2	<1		5	
Trimmings	<1	<1	55	<1	<1	
ITM (FIP)[2]						
Total	<1	<1	<1		<1	

[1] Comprehensive FIPs aim to achieve a level of performance consistent with the MSC Fisheries Standard.
[2] In Transition to Marine Stewardship Council (MSC), operated by MSC

Marine ingredients originating from trimmings (by-products)

In addition to the use of wild-caught fish, the processing of fish for human consumption gives rise to a by-product that is not used in the final seafood product. These offcuts generated after processing are valuable as a raw material from which fishmeal and fish oil are often produced. It is estimated that roughly one third of fishmeal produced is made from seafood by-products from fish for human consumption. The use of by-products is increasing as more whole fish are used for direct human consumption, and society becomes more successful at collecting the material and fuelling the bioeconomy.

We have mapped the origin of marine ingredients in Skretting that come from by-products. In 2023, it was 31%, and the average over the last six years was 34%. Also, by-products originating from aquaculture are becoming an important source used for marine ingredient production.

Percentage of marine ingredients in Skretting originating from trimmings, including from aquaculture

Year	Whole fish	Trimmings
2018	74	26
2019	71	29
2020	57	43
2021	63	37
2022	61	39
2023	66	31
Average	65	34

Our progress on the Marine Ingredients Responsible Sourcing Policy

To protect the ocean and ensuring that fish stocks caught for direct or indirect human consumption are fished within clearly defined, sustainable limits, Nutreco and Skretting published in 2022 a Marine Ingredients Responsible Sourcing Policy.

In line with our Sustainability RoadMap 2025, we strive to ensure that our marine feed ingredients come from sustainable sources in the short- and long-term and that all the fishmeal and fish oil that we use originates from fisheries that are managed according to the FAO Code of Conduct for Responsible Fisheries. In practical terms, we have defined different sustainability classes for the main groups of marine ingredients (whole fish, by-products from wild fish and by-products from aquaculture). For details on the different sustainability classes, please consult our sourcing policy.

In 2023, 52% of whole fish originated from MarinTrust programme or Marine Stewardship Council certification. This is a decrease from last year, mainly due to the full impact of several important fisheries losing their MSC certification (blue whiting, Atlantic herring and Atlantic mackerel). The share originating from FIPs has increased to 24%. This is partly due to the fact that such an important fishery, Blue whiting, has changed its status from a certified fishery to enter into an FIP. We are not seeing other fisheries that are able to complete the improvement project and enter certification. For trimmings from wild fish, we see a reduction in the share of certified material for the same reasons we've seen for whole fish.

As a result of all these developments, we are experiencing challenges in reaching our targets. Certification of local fisheries is lacking in the areas where Skretting operate, especially in Latin America, Asia and Africa. This can be because certification programmes are not well known in these areas and there is less pressure from the markets to certify these fisheries. Fisheries in more tropical areas are more complex to manage; they are often multi-species fisheries where it is resource-intensive to gather scientific data and not always possible to use the same principles used to manage single species fisheries. This makes certification more difficult and demanding.

We are well on track to meet our targets on by-products from wild fish and by-products from aquacultures. The main challenge in this area is that information on origin can be missing or of poor quality.

Progress against our Marine Ingredients Responsible Sourcing Policy compared to target in 2025.

Marine ingredient type	Whole fish		
	Target	2023	2022
Sustainability class A+ and A	85%	52%	68%
Sustainability class A-	Maximum 15%	24%	16%
Sustainability class B[1]		24%	24%
Sustainability class C[1]		16%	16%

[1] Includes also where data on origin is missing.

Marine ingredient type	By-products wild fish		
	Target	2023	2022
Sustainability class A+ and A	50%	72%	81%
Sustainability class A-	50%	5%	4%
Sustainability class B[1]		22%	15%

Marine ingredient type	By-products aquaculture		
	Target	2023	2022
Sustainability class A+ and A	50%	89%	78%
Sustainability class A-			
Information lacking		11%	22%

[1] Includes also where data on origin is missing.

Important raw materials for salmon threatened by failure to agree on fishing quotas

Blue whiting is an important part of salmon's diet in Europe, but Skretting and other feed companies are ready to walk away from the fishery if an allocation agreement cannot be reached before the fishery's current time-bound FIP expires next year.
Coastal nations with claims to the Northeast Atlantic blue whiting fishery seemingly cannot or will not come to multilateral quota agreements, after two decades of failed negotiations. This has resulted in the overexploitation of the species because the total catch is not in line with scientific advice. The MSC certification was pulled in 2019 due to poor management, and the world's only known "political" FIP was established shortly after.

Blue whiting might be lost for salmon feed
Blue whiting (Micromesistius poutassou) is a pelagic species primarily harvested as a raw material for the fishmeal markets and is in great demand by Europe's leading salmon farmers.

Skretting Norway has clearly said for several years that we will only buy marine raw materials from whole fish from certified fisheries, or fisheries involved in a verified FIP. We didn't think we'd see this problem in fisheries in our own backyard. We're frustrated that nations in the North Atlantic cannot agree on the distribution of the quota. While all agree on the total quota, everyone demands pieces of the cake that, when totalled, are bigger than the cake itself.

NAPA fights for sustainable fisheries of mackerel, herring and blue whiting
The North Atlantic Pelagic Advocacy Group (NAPA), is a market-led approach to improve North Atlantic pelagic fisheries management and comprises all the major fish feed companies plus large retailers, such as Young's, Tesco, Sainsbury's, Aldi and Waitrose, who all condemn the collective failure to ensure the sustainability of these species.

Blue whiting is not the only problem. Norway, Iceland, the Faroe Islands, Greenland, the European Union and the United Kingdom have all failed repeatedly to ensure the total catch of mackerel, herring and blue whiting in the north-east Atlantic is in line with scientific advice.
NAPA aims to drive sustainability in these fisheries by securing an agreement on total allowable catches (TACs) in line with scientific advice, as well as long-term, science-based fisheries management strategies. These stocks are data rich and well understood, meaning that coastal states simply need to collaborate and agree on sustainable quota shares to manage them sustainably.

Three years wasted, one last chance to make a difference
The group is tackling these issues through the establishment of two FIPs – one for mackerel and herring, and one for blue whiting. The FIPs serve to drive political will for sustainable management while holding key actors and decision-makers to account. Given the commercial importance of these decisions, NAPA believes that the voice of the supply chain should be a key input into these discussions. The three-year FIP for mackerel and herring ends in April 2024 and for blue whiting in October 2024.

The market will act if governments do not
With a self-imposed deadline on the horizon, and many retailers and all the major feed companies saying they will no longer purchase these stocks from the region unless a sustainable sharing agreement can be reached, NAPA urges the coastal states to act in accordance with their commitment to follow the science and reach a sharing agreement as soon as possible.

The clock is ticking, and it is a paradox that the best ocean managers in the world can't come to an agreement. Blue whiting is a fantastic ingredient — it's sustainable if well managed, and it's here now. It would be a tragedy if we should fumble and lose this ingredient just because our governments can't get their acts together.

Leif Kjetil Skjæveland
Sustainability and Public Affairs Manager
Skretting Norway

Novel ingredients

Against the backdrop of a growing world population and a large projected increase in aquaculture production, the aquafeed domain needs to embrace novel ingredients.

At Skretting, we have successfully used a handful of them – such as algal oils, insects and single cell proteins – in our commercial feed. But for every success story, the truth is that there are many other ingredients that have been tried, tested and then ruled out for reasons ranging from regulatory issues to poor economics. In fact, we have evaluated over 200 ingredient combinations to date, and many have not made the grade.

In 2023, our usage of novel ingredients grew to 0.99[1]% from 0.79% in 2022. Clearly, we have noticed several novel ingredients becoming more mature and have witnessed step-ups in volumes and professionalism. At the same time, the overall available volumes are small compared to that of traditional ingredients. Scaling up novel ingredients is a costly and time-consuming affair, especially with interest rates having risen over the course of 2023. However, we aim to grow our usage of novel ingredients, though we realise that the 5-10% target we set across Nutreco will be too ambitious, as volumes are not there at the right prices to achieve the inclusion levels needed for the target we have set.

In 2023, we put a clear focus on omega-3 replacement products. Given high fish oil prices, 2023 was a year in which three or four times the current amount of omega-3 alternatives could have been purchased if those volumes were available. With continued volatility in the fish oil market, we clearly want to reduce our dependency on this product.

While no new product categories have surfaced in 2023, we do note more players entering the omega-3 replacement, insect meal and single cell protein (SCP) market. This clearly indicates the potential for these products, and Skretting is ready to take more of these ingredients on board in the coming years.

[1] This is a correction from the 1% published in our 2022 Sustainability Report

Sustainable product launches

During 2023, we launched five feed solutions for five different species, that are supporting our ambition to drive sustainable growth in aquaculture. Here are some highlights:

Nutra Terra

Reducing phosphorus discharge is a priority for the Norwegian salmon industry as well as the country's authorities. Research and development results have shown that Nutra Terra, our latest salmon fry feed, reduces the amount of phosphorous and zinc in faeces by 30%.

Elevia

Thanks to the inclusion of encapsulated omega-3 fatty acids, this hatchery solution for shrimp reduces the leaching of lipids into the production system, ensuring cleaner and uncompromised water quality. Feed particles remain stable for extended periods, minimising the need for frequent water replacement.

CLEAN Labrus

CLEAN Labrus was specifically developed for Ballan wrasse, a growing aquaculture species. The easily digestible diet meets the species' nutritional requirements with precision, supporting fish robustness and welfare.

Optiline Catfish

Catfish is a species of increasing importance in the African market and represents a crucial source of protein and livelihood security. Optiline Catfish enables farmers to efficiently meet the nutritional needs of catfish in a cost-effective manner.

Cosmos

Cosmos is our new premium feed specifically developed for barramundi. Research and development and validation trial results have shown reductions of up to 9% in FCR and up to 10% faster growth.

Chapter 5
Collaboration with stakeholders

Creating a sustainable future through dedication, innovation and transparency: Cermaq

> Sustainability is a journey that requires dedication, innovation and transparency.

Cermaq Group AS is a leading global producer of aquaculture salmonids and is committed to promoting responsible aquaculture practices and technological innovations to enable the shift to more sustainable food systems globally. Sustainability is not just a buzzword for us; it's an ongoing commitment that guides every aspect of our salmon farming practices. While reducing our carbon footprint is crucial, sustainability encompasses a broader spectrum of responsibilities, driving us to ensure responsible stewardship of our resources.

Innovation serves as the engine for sustainable growth in the aquaculture industry. By continuously exploring new technologies and alternative feed ingredients, we can minimise our environmental impact, improve efficiency and enhance the nutritional quality of our salmon feed.

However, one of the significant obstacles hindering progress in sustainability is the lack of transparency in global animal feed supply chains. The opacity of these supply chains exposes the sector to unforeseen risks and vulnerabilities, making it imperative to prioritise transparency and traceability initiatives. Recognising the importance of transparency, we are committed to improving the visibility and traceability of our supply chains. Not only does this provide us with valuable insights into sourcing practices, but it also allows us to offer assurances to our stakeholders – including customers, regulators, communities and investors – that we prioritise responsible and sustainable sourcing.

Sustainability is paramount for the future of salmon feed aquaculture. By diversifying the raw material basket and fostering stakeholder partnerships, the industry can address its Achilles' heel of raw material dependency and pave the way for a more resilient, competitive and environmentally sustainable future. A consistent approach to engaging with our feed suppliers is essential for driving meaningful improvements in sustainability. By focusing on key areas such as biodiversity, climate impact, resource use and human rights, we can ensure that our supply chain partners share our commitment to responsible practices.

Moreover, urgent action is needed to address significant gaps in animal welfare and ethical considerations within the aquafeed industry. As stewards of the environment and guardians of animal welfare, we must prioritise the well-being of both our salmon and the ecosystems they inhabit.

In other words, sustainability is a journey that requires dedication, innovation and transparency. By embracing these principles and fostering collaboration across the aquaculture value chain, we can create a more sustainable future for salmon farming – one that prioritises environmental responsibility, ethical practices and long-term viability.

Tibiábin Benítez-Santana
Global Feed and Nutrition Manager
Cermaq Group

Finding success in changing times with a focus on sustainability: Cofimar

Peter Grunaer
Commercial Coordinator
Cofimar

COFIMAR S.A. was established in Ecuador in 1995. It has a long family legacy in the shrimp industry – its founder, Alfonso Grunauer, has been one of the pioneers of the shrimp farming industry in Ecuador since 1967.

In the past, the shrimp farming industry grew by increasing production rates, supported by the development of China as its main market. However, in recent years, COFIMAR has seen the focus shifting towards adopting more sustainability practices and standards to participate in the European market.

COFIMAR also started out with a focus on increasing production and expanding, but when we wanted to enter traditional markets, we faced aggressive competition from companies operating out of Ecuador and abroad.

We realized that we had to comply with different approaches in the market, and this is when we understood that we had to take steps first to prepare for such a big challenge. So, our immediate action point was to switch to value-added products that would enable us to expand our production lines and access different markets.

We wanted to move towards more sustainability practices, and knew we had to set ourselves new challenges, including taking a different look at developing a sustainable, world-class product. And that is how our path began.

We started working towards Aquaculture Stewardship Council (ASC) and Best Aquaculture Practices (BAP) certifications, to promote best practices internally, and then moved on to develop a sustainability programme. At first there were doubts and concerns within the team. However, because it was something totally new and it aligned with our vision, we managed to change this way of thinking by communicating about the challenges facing us – and also the honour of being chosen as a key part of a sustainability opportunity by the best retailer in the Netherlands.

The story started when COFIMAR met Klaas Puul one of the leading producers of fresh fish products in Europe, at a trade show in Guayaquil, Ecuador. We always try to make our partners feel at home in our facilities. When the Klaas Puul team met the Grunauer family, COFIMAR's owners, everything just clicked. They said, "we want to grow with you." They told us they supply one of the biggest retailers in the Netherlands, Albert Heijn, and wanted to know if we would be willing to try a sustainable soldier fly feed programme. From that point on, the rest is history.

Thanks to Skretting's management – who gave us all the guidelines we needed at the beginning and said if we wanted to be a part of this challenge, they would join us – we agreed to embark on this journey.

COFIMAR has invested in technology, special feed and specific production lines with traceability throughout the whole project – all the way from hatcheries with non-ablated females to packaging control. This means that, in the end, we can provide clear traceability, along with the freshest shrimp, always!

As part of the sustainability programme, we put in place a policy stating that, starting in 2024, we will transfer use non-ablated females from the hatcheries at all our ASC and BAP-certified farms. Working step by step, we expect to finalize this sustainability protocol in 2025.

Through the soldier fly programme, we realised that it is possible to switch from one feed protein source to another and still perform well in the field. Skretting was a key part of opening up this sustainability programme for us.

Now, we want to start increasing our line of value-added products – not only cooked, but also marinated products – different lines that allow us to offer diverse items and compete with other countries that have already reached this step in their supply chains. We know it costs money and effort to obtain certifications, but it is the only way Ecuador can expand in value-added products.

We are always eager and curious to learn what other steps we can take. The key to our success is our staff – we have an excellent team with vast experience and the constant commitment to always delivering the freshest shrimp.."

A responsible value chain for fish feed

> At FF Skagen, we steadfastly uphold our commitment to responsible practices, underpinned by scientific research and adherence to national and international legislation and standards.

Johannes Palsson
CEO
FF Skagen

At FF Skagen, a leading European producer of fishmeal and fish oil, we are committed to upholding responsible production and sourcing practices. Over the past decade, we have invested in advanced traceability systems to ensure transparency and accountability across the supply chain. We have implemented independently certified, fully documented weighing and bycatch control systems and source our fish from responsibly managed fisheries in the Northeast Atlantic region. Our subsidiary, Scandic Pelagic, ensures a sustainable supply of herring trimmings. Our commitment to responsible production is underscored by certifications from standards such as ISO 9000, ISO 14000, FEMAS, MarinTrust, MSC Chain of Custody, Naturland and Soil Association.

Recently, some certification operators have revoked certifications for fisheries based on political disagreements rather than scientific evidence. While these decisions may reflect differing interpretations of responsibility, they risk undermining the integrity of the certification process and the credibility of the certification standards and sustainable fisheries management efforts. For the value chain, this is concerning.

The development of the blue whiting stock highlights the effectiveness of a precautionary approach and responsible management. Despite the absence of a political agreement between coastal states, the recommended total allowable catch has increased significantly in recent years, from 752,736 tons in 2022 to 1,529,754 tons in 2024: a 103% increase in availability over three years, underscoring the success of measures aimed at ensuring the sustainability of the stock.

At FF Skagen, we steadfastly uphold our commitment to responsible practices, underpinned by scientific research and adherence to national and international legislation and standards. We fully endorse the efforts of organisations such as the International Council for the Exploration of the Sea (ICES) in providing evidence-based recommendations for the management of fisheries in the Northeast Atlantic region.

Despite the lack of certifications of some of our raw materials, justified by the certification operators as political disagreements, sustainable management of the fish stocks is an overarching goal.

As responsible stakeholders in the value chain, we must agree that the scientific documentation and well-documented legal landings of different fish species are sufficient to allow the North Atlantic fish stocks to be used as a feed ingredient in fish feed. And we must continue to advocate for responsible fisheries management and production practices.

Since we cannot dictate policy decisions, we continue to operate responsibly and educate consumers about the realities of sustainable seafood sourcing as a vital part of securing healthy food for the growing population.

Partnering for sustainable growth with natural marine algae from Veramaris

Veramaris is the producer of the world's first ASC- and MSC-certified algal oil, a sustainable and reliable alternative source of omega-3 EPA and DHA fatty acids that are essential for fish health and welfare and help to control the nutritional quality of farm-raised seafood for consumers too.

Meeting global demand
As aquaculture grows globally, and with an increasing awareness of the benefits of these essential fatty acids for people and animals, Veramaris is supporting the sustainable growth of the industry by adding to the supply of omega-3 EPA and DHA. Recent fish oil disruptions, particularly in Peru, have shown the risks of relying solely on traditional sources of omega-3. Veramaris, with its documented safety and performance and its established commercial-scale production, has been instrumental in mitigating the impact of the supply crisis.

Veramaris' algal oil also helps to reduce the marine footprint of farm-raised seafood, allowing aquaculture to continue to grow without increasing pressure on limited supplies of certified forage fish oil as a source of omega-3 EPA and DHA.

Driving change through partnerships
Partnerships have been crucial to Veramaris' success. With allies like Skretting, Veramaris has evolved into a trusted omega-3 EPA and DHA provider. Skretting recognised the need for alternative omega-3 sources early on and has been integral in working with Veramaris to develop this product, from assisting with product trials to educating customers about the advantages of the company's algal oil.

Veramaris' partnership with Skretting and other stakeholders is paving the way for a sustainable future for aquaculture, ensuring a steady supply of healthy seafood. The inclusion of algal oil as an alternative source of omega-3 EPA and DHA in aquafeed is no longer just an option but a necessity for the industry to grow. We're happy to see fish farmers committing to algal oil as a reliable, sustainable alternative source of omega-3 EPA and DHA, by changing their feed specifications.

Gertjan de Koning
CEO
Veramaris

Value chain collaboration to supply sustainable shrimp from Ecuador to European supermarkets

> The commitment of each of the consortium partners was crucial to make this project successful and jointly deliver a sustainable product to Albert Heijn's consumers.

Willem van der Pijl
Owner
Shrimp Insights

Since 2022, I have had the pleasure of contributing to establishing a partnership between Albert Heijn, a major Dutch retailer, and Klaas Puul, its most significant supplier of chilled tropical shrimp. Early conversations with Albert Heijn showed that tropical shrimp was viewed as a high-risk product. The team responsible for the category had many issues on their radar that would have to be dealt with over the next few years. One of the topics was related to the sustainability of shrimp feed. The Albert Heijn team had concerns about the sustainability of marine and plant-based ingredients and the overall impact of feed formulation on the carbon footprint of shrimp it sells to customers.

At this time, Albert Heijn was also actively approached by Skretting and ingredient suppliers such as Veramaris (algae oil) and Protix (insect protein), who encouraged the retailer to take steps towards a more sustainable shrimp product.

It was my role to bring all these different stakeholders together and define a proposition that was economically and technically possible and, at the same time, impactful in terms of sustainability. It took us multiple years to agree on what such a proposition could look like. Eventually, we decided on a feed formulation in which part of the fishmeal is replaced with insect meal, part of the fish oil with algae oil, all remaining marine ingredients are sourced from MarineTrust-certified fisheries, and all soy comes from land conversion and deforestation-free origins. After a long trajectory of negotiations, the contract with Albert Heijn was signed, and all other stakeholders could also sign their contracts. We ended up with the best possible outcome: Albert Heijn decided not just to offer a few SKUs from our project but also to include the whole chilled assortment and put in place an expansion plan for ready meals and frozen assortments.

This was not a straightforward trajectory. Possibly the most challenging was finding a supplier in Ecuador who could produce this product for Albert Heijn at a competitive price. This producer had to dedicate ponds to this project and change its usual working method. It had to take the risk of working with the new feed and with new post-larvae (because Albert Heijn requires post-larvae to come from non-ablated broodstock). This would never have succeeded without the close cooperation and continuous conversations within the consortium. The commitment of each of the consortium partners was crucial to make this project successful and jointly deliver a sustainable product to Albert Heijn's consumers. Since April 2024, the product has been for sale in Albert Heijn's shops in the Netherlands.

Global Salmon Initiative

Sophie Ryan
CEO
Global Salmon Initiative

> The risks we face are too grave to face alone and we need to work together, to learn from one another, if we are to build resiliency at the speed and scale needed.

Last September, we marked the GSI's 10th anniversary: a decade of companies working together with the aim of driving measurable improvements in the sustainability performance of the global salmon farming sector, and, more importantly, demonstrating progress as highlighted by the GSI's Sustainability Report in areas such as ASC certification, fish welfare and feed ingredients. And while this milestone was an opportunity to look back on the advancements the group has made over the past 10 years, more importantly, it highlighted the need for continued collaboration and adaption for the next 10 years.

The world faces many risks in the coming decade – a changing climate, for one, poses multiple risks to our planet, supply chains and operations, and we know change is needed at a faster pace than it is currently progressing. The risks we face are too grave to face alone and we need to work together, to learn from one another, if we are to build resiliency at the speed and scale needed. This collaboration will need to expand beyond industry, and incorporate all stakeholders – from academia and public policy to the value chain and customers – if we are to see real, long-term change.

Which is why at our 10th anniversary, we set out our evolved GSI vision for the future. This includes how we intend to use the learnings of the last decade to inform and motivate continued improvements in the sustainability performance of the sector and how GSI members and our supply chain partners will continue to pool their knowledge and expertise to accelerate advancements in three key areas: climate action, nature and biodiversity, and supporting more sustainable food systems globally.

We have some big projects underway this year, from the launch of the ESG Feed Risk Assessment Tool, our GHG Climate Action report and our continued work in improving fish welfare. We recognise that we cannot slow down, but, in fact, must double down in our efforts to farm salmon that's raised to be better for people and planet.

GSI's Three Pillars

SeaBOS

It is increasingly acknowledged that collaboration is the way forward to reach the SDGs. Since 2016, SeaBOS has developed a unique, science-business model to co-develop solutions for ocean stewardship with the support of Skretting, a founding member of the initiative.

In 2023, we marked several important milestones for SeaBOS. Throughout the year, SeaBOS members reaffirmed their commitment to drive transparency and sustainable practices in the seafood industry by publishing our first Impact Report. Key achievements as of 2023 included:

- **IUU fishing and modern slavery:** We conducted risk assessments to identify and mitigate risks associated with forced labour and IUU fishing across member companies' operations and supply chains.
- **Biodiversity and ecosystems:** We launched initiatives to evaluate and manage biodiversity risks and impacts, including advancing the protection of endangered species.
- **Anti-microbial resistance:** We implemented a roadmap to reduce antibiotic use in seafood operations and enhance transparency in measurement and reporting.
- **Climate resilience:** All SeaBOS companies set ambitious emissions reduction targets with public reporting on scope 1, 2 and 3 emissions.
- **Ocean plastic reduction:** We executed a global ocean clean-up campaign that led to the recovery of 25 tons of oceanic plastic, complemented by measures to reduce plastic usage and assess packaging footprints in operations.

In 2023, SeaBOS CEOs also approved an exciting new phase with the initiation of two regional Keystone Projects. These will be co-developed by the SeaBOS science and industry members with the aim to apply the measures and tools developed in these projects to other regions, if successful. The projects will benefit from Skretting´s experience and contributions in the coming year, including as co-lead of the West Coast Africa Keystone Project.

West Coast Africa Keystone Project: structured to address IUU fishing and labour abuse in seafood operations in Mauritania, Morocco and Senegal, specifically in octopus, small pelagics and tuna fisheries in the region.

Antimicrobial Resistance Keystone Project: aimed at developing protocols for understanding the presence of antimicrobial resistant genes in aquaculture production, with the first phase involving sampling and testing of farmed shrimp in Thailand, connecting SeaBOS science experts, company members, aquaculture suppliers and other partners.

Skretting has also been leading the SeaBOS Task Force on Biodiversity and Ecosystems, which has been of great value for the partnership. By sharing best practices and experiences, Skretting has effectively contributed to developing the joint efforts of SeaBOS to deliver on its mission to lead a global transformation towards sustainable seafood production and a healthy ocean. While much has been achieved by the nine SeaBOS member companies, the work will continue to strengthen ocean stewardship in seafood operations and supply chains through collaborative efforts to move forward faster, with more impact.

Wenche Grønbrekk
Director of Strategy, Partnership and External Relations
SeaBOS

IFFO - The Marine Ingredients Organisation

> Marine ingredients are uniquely positioned to meet existing and upcoming requirements.

After a volatile 2023, with weather conditions and geopolitics impacting the availability and prices of commodities, the aquafeed industry is, rightly, looking at the factors it knows will underpin progress for 2024 and the years ahead. Sustainability of feed ingredients is set to remain high on the agenda, based on socially and environmentally responsible sourcing requirements and standards for responsible production. Their environmental impacts are bound to decrease while feed palatability and health benefits stabilise at the most adequate levels.

Marine ingredients are uniquely positioned to meet existing and upcoming requirements: IFFO's members have been conducting thorough LCA work for the production of marine ingredients, which will guide further action plans at factory and company levels, but also provide updated data to the public GFLI database. Furthermore, IFFO has been involved in a due diligence approach, looking at the impacts of the value chain through a human rights lens. This approach complements the already well-established third-party certification process that MarinTrust implemented on a voluntary basis more than a decade ago. As for fish health, palatability and carbon footprint, marine ingredients production relies on decades of science. At key stages of a fish's life, marine ingredients are an absolute requisite because of their unmatched nutritional profile.

Petter Martin Johanessen
Director General
IFFO

Global Roundtable on Marine Ingredients

Árni M Mathiesen
Independent Chair
Global Roundtable on
Marine Ingredients

The Global Roundtable on Marine Ingredients was initiated in 2021. Three years on, and we have expanded our membership so it forms a powerful coalition of marine ingredients value chain stakeholders, among which Skretting has been pro-active and supportive. This membership provides a robust foundation for undertaking long-term projects that contribute to increasing the sustainability of key small pelagics fisheries globally and the availability of responsibly sourced raw materials.

In October 2023, we decided to publish the Track the Fish report in its entirety: we commissioned Partner Africa, a third-party NGO, to prepare this study, that looked into the industry's impacts in Mauritania and Senegal through the United Nations' human rights framework. We believe that this bold action, combined with focus groups and workshops, such as the one we co-organised with the FAO in Ghana in December 2023, will drive positive change in these countries and position the industry at the forefront of the sustainable management of natural resources and dialogue with local communities. This is just the start of the journey. Only through collaboration and global market pressure can we champion best practices.

> Only through collaboration and global market pressure can we champion best practices.

Making progress on the FIP in Mauritania

Jo Gascoigne
FIP Coordinator

In 2023, the main activities of the FIP in Mauritania focused on sampling and monitoring, to improve the data available for stock assessment and management. During the year, 550 samples were taken from factories, covering 65,000 tons of landings, and meeting FAO minimum sampling requirements. In addition, 32,821 individual fish were measured. The backlog of data entry has been cleared and a preliminary data analysis conducted. The first robust stock assessment for the two sardinella stocks was peer reviewed and published in January 2024, thanks to these data. This has been integrated into scientific advice on a national and regional level.

2023 was year one for the implementation of the small pelagic management plan (PAP-PP). Since our workplan is aligned with its objectives, our work supports the plan's implementation in general terms, but we also supported it through a student thesis considering the appropriate number of vessels and factories for sustainable exploitation of the resource.

We have made progress on the ecosystem element of the FIP workplan this year with support from MSC. This involved observer deployments on board the fishing vessels and the analysis of discards and interactions with protected species. In 2023, there were nine observer trips in total. Bycatch of non-target species varied from around 2-10%, depending on the season. The bycatch consisted of common fish, such as breams, grunts and jacks. No vulnerable or protected species were identified in the bycatch. Nothing was discarded – the bycatch was either frozen for human consumption or incorporated into the fishmeal.

In 2023, outside experts Partner Africa conducted a social audit of the FIP, supported by the IFFO/ SFP Global Roundtable for Marine Ingredients. We have obtained funding from the Sustainable Fisheries Fund to convert this audit report into a social workplan for the FIP.

Launch of the Fisheries Improvement Fund

> The FIF is an innovative financing model aiming to reverse the global trend of fisheries decline through the implementation of FIPs.

Elizabeth Beal
Managing Director
Finance Earth

In April 2023, Finance Earth, in collaboration with World Wildlife Fund (WWF) and leading industry partners, launched the Fisheries Improvement Fund (FIF): a new funding mechanism to finance the transition to more sustainable fisheries worldwide, with the ambition to catalyse $100 million in investment in fisheries improvement by 2030.

The FIF is an innovative financing model aiming to reverse the global trend of fisheries decline through the implementation of FIPs. FIPs are multi-stakeholder initiatives enacted worldwide to improve fishing practices and management to benefit both marine ecosystems and the people that live and work in and around them.

The FIF aims to accelerate the rollout and completion of FIPs by providing a stable flow of funding to enable full delivery of FIP activities and objectives. The FIF achieves this by combining an equitable and transparent volume-based payment mechanism for supply chain engagement with an innovative use of investment to ensure that funding for FIP delivery covers the full cost of activities needed. Key benefits of the approach include:

- FIPs fully funded to completion
- A range of supply chain participation options, including an equitable volume-based fee mechanism
- Impact assurance for funders
- Impact investment to cover up-front FIP costs
- Sustainability built into product cost
- Finance unlocked at scale for fisheries transition

The first FIP to be supported through the FIF will be in the central-southern region of Chile. Skretting is a key financial supporter of the fund and this project, and has signed one of the first volume-based fee agreements to provide funding through the FIF mechanism. By contributing to this project, Skretting is helping to support the transition to more sustainable marine ingredients in one of the world's most ecologically essential seascapes.

The FIF's approach is based on the business case for companies to invest in the long-term viability of their seafood supplies, reducing supply chain volatility and risk, while enhancing business value and protecting reputations. It allows capital to be channelled at scale and at pace towards addressing ecological and social issues in target fisheries, ensuring that fish stocks and fishing communities can reap the benefits of sustainable fishing into the future.

Aquaculture Stewardship Council (ASC)

There is no responsible seafood farming without responsible feed. The ASC Feed Standard represents a pivotal step towards greater sustainability and responsibility in aquaculture, and in 2023, Skretting became one of the first feed companies to enter the certification process.

The ASC Feed Standard:

- Requires feed mills to conduct due diligence on key human rights and environmental risks in feed ingredient supply chains, including at the source farm/fishery
- Tackles both illegal and legal deforestation and land conversion risks of all crops used in feed, not just soy and palm oil
- Introduces a unique improvement model to increase the use of certified marine ingredients
- Champions transparency through public reporting

Alongside Skretting, numerous other feed companies have already undertaken the rigorous audit process. From their experiences, we have seen some consistent challenges, as well as opportunities for further strengthening the Standard's positive impact.

It's clear that traceability of ingredients continues to be a major challenge for companies undertaking due diligence across their supply chains. While technology can help here, it requires collaboration across the supply chain to share information necessary to assess risk.

Collaboration is also needed to support the transition to better practices at the fishery and farm level. FIPs cannot adhere to their timelines – and deforestation/conversion target dates will not be met without feed companies and other supply chain actors working together to provide funding, create market demand and take accountability.

While navigating the ASC Feed Standard presents challenges, it also offers invaluable opportunities for Skretting and other feed companies to drive positive environmental and social change, enhance competitiveness and demonstrate leadership in more sustainable aquafeed production. Certification serves as a powerful differentiator in the market.

Skretting is in the leading pack of trailblazers who have embraced this revolutionary approach, with operations in Chile obtaining ASC Feed Standard certification in January 2024 – and more in progress globally.

As worldwide demand for farmed seafood continues to grow, it is vital that the entire aquaculture supply chain transforms towards more environmental and social responsibility – the ASC Feed Standard is a significant step in the right direction.

Alexandra Warrington
Senior Coordinator
Feed Standard
ASC

Skretting Chile became the first salmon feed mill in the world to obtain ASC Feed certification

The milestone was reached one year before the deadline established by the ASC and reinforces our company's commitment to supporting Chilean salmon producers. This demanding standard considers productive, environmental and social factors and guarantees the transparency of all our processes, visualising through public documents the progress that the company is making towards the sustainability of the aquaculture industry.

Much of the work was based on the origin of the ingredients and on being able to determine which ones are eligible. In addition, this certification has a social component that requires a policy of permanent linkage with our neighbouring communities.

> We are very proud of having been the first to reach this milestone. It was a tremendous teamwork that required the commitment from all areas of the company, and we are willing to share our experience with the other Skretting business units.

Juan Manuel Leiva
Quality Assurance Manager
Skretting Chile

MarinTrust

The year 2024 will be pivotal for the aquafeed sector. Demand for seafood keeps growing, and so do the prices of feed ingredients. In a fluctuating environment marked by extreme weather conditions and political tensions, feed producers, farmers, retailers and the end consumer face the contradiction: should inflation drive us all away from responsible sourcing?

Continuous improvement is MarinTrust's approach to the sourcing and production of marine ingredients. Therefore, we set the standard that serves as a benchmark for certification bodies to grant a certificate of responsible supply at the production factory level or as an assurance of an unbroken chain throughout the ingredients' journey. We also offer a pathway to those factories not meeting the standard's requirements, so they improve over time and are encouraged to sustain their efforts in the long term: this is the aim of the MarinTrust Improver Programme.

A short-term commitment is not an option: our requirements keep developing to reflect international guidelines and consumers' expectations. The new version (Version 3) of the MarinTrust Factory Standard becomes applicable in 2024. We are proud to keep increasing the robustness of our standard and be recognised in Skretting's sourcing policy. Collaboration with other standards, sitting at other stages of the supply chain, is critical to us as it helps streamline the efforts and make our programme more accessible.

With feed producers having a seat on MarinTrust's Governing Body Committee, we ensure that our programme remains fit for purpose and that the credentials of the ingredients used in feeds are well understood and represented.

Libby Woodhatch
Executive Chair
MarinTrust

Marine Stewardship Council (MSC)

Camiel Derichs
Program Development Director
Marine Stewardship Council

Marine ingredients are a crucial component of aquaculture feed. Notwithstanding possibilities to substitute fishmeal and oil with alternative ingredients in feed, it is likely that the continued growth of the aquaculture industry in decades ahead will further increase dependency on marine ingredients. However, there is considerable uncertainty about the long-term supply of marine ingredients, and about the attractiveness of these ingredients for feed production.

There are several reasons for this. Firstly, poor fisheries management, which, combined with the accelerating impacts of climate change, results in over-exploitation and degradation of renewable resources that provide the raw materials for marine ingredient production. This implies supply insecurity, or lower volumes of fishmeal and fish oil, and associated price pressure. Secondly, reputational and legal risks associated with marine ingredient production are high for feed producers. These risks grow as the state of resources erodes, as environmental, social and governance (ESG) regulation increases, and as communities depending on these resources become more impacted. Third, the rise of alternative ingredients at scale makes those ingredients more competitive and less risky compared to fishmeal and fish oil.

To control costs, reduce long-term supply insecurity, credibly mitigate reputational risks, and demonstrate high ESG performance – e.g., to meet legal requirements or expectations from (capital) markets – the aquaculture and feed industries have a major need and responsibility to help turn the tide.

Industry leaders like Skretting know this. ESG policies and associated sustainable sourcing policies are in place, and aim to drive improvements in fisheries management, credible independent verification and documentation of high ESG performance through (eventually) MSC certification of all marine ingredients.

> We look forward to supporting Skretting in this effort, to help deliver performance outcomes aligned with targets under the SDGs and towards agenda 2030.

Global Seafood Alliance

Get the recipe right and feed companies can help catalyse the global transition to low-impact feeds and food.

As we gradually transition to foods with a smaller impact on the environment, feed companies can play a pivotal role because the formula for a sustainable feed encapsulates the formula for a sustainable planet: feed formulation can act as the clearing house for balancing nutritional and environmental imperatives.

Consider that the world already produces enough food to feed everyone, but people still suffer from malnutrition because of inefficiencies: massive amounts of agriculture are diverted to biofuels and many animal production systems are wasteful. This is where the feed companies need to act, helping to direct the world's limited feed resources to where they have the greatest positive impact on our nutrition, for example, by helping to expand the availability of healthy products from fast-evolving, new production systems such as aquaculture.

Take salmon farming as an example. At a global level, many of us need to transition to a more vegetarian diet or at least to eat a greater proportion of meat derived from efficient systems. Feed companies have already worked a kind of magic by optimising diets for farmed salmon, gradually increasing the inclusion of processed by-products and plant-based ingredients and simultaneously reducing the inclusion of fishmeal and fish oil, thereby converting a carnivorous fish to an omnivore (while maintaining health and welfare). At the same time, this allows the world's limited supplies of fishmeal and fish oil to realise their full potential, as strategic nutritional ingredients rather than bulk components, and keep fuelling a steadily expanding aquaculture sector. It's amazing to consider that fishmeal was once wasted as fertiliser!

All the same, much more work still needs to be done to enhance the sustainability and traceability of aquafeed ingredients.

> Feed companies and standard setters will need to cooperate closely to get the recipe right for a sustainable planet.

Dan Lee
Technical and Projects Advisor
Global Seafood Alliance

Efforts to address the continued connection between irreplaceable ecosystems and the global food system have taken a significant step forward in 2023. A part of that was also the launch of a revised sector-level independent verification standard Skretting supported from the very beginning in 2019. The revised monitoring system, named ProTerra Monitoring and Verification Standard, is the first sector-wide system that has been collectively developed, monitored and reported with producers, shippers, feed manufacturers, livestock producers and civil society to provide a credible solution to addressing deforestation and land conversion.

Such systems are needed at a time when all supply chain actors in Europe need to demonstrate that there is a negligible risk of deforestation in their soy supply chains as part of the recently adopted EUDR. This legislation will enter into force on December 30, 2024, leaving less than one year for companies to provide evidence needed to satisfy this new market requirement.

Clear mechanisms are needed for going beyond the legal minimum requirements of the European regulation by ensuring that supply chains are not only free from deforestation, but also that all ecosystems are protected, as the participating companies have committed to avoid sourcing from any land connected to deforestation and conversion, and their performance is verified. Key features of a system that enable these outcomes include company-wide commitments, changes in company procurement and independent verification.

The current changes at a legal level worldwide strengthen global efforts to transparently deliver deforestation- and conversion-free supply chains.

Certification schemes can be a tool to support the implementation of the legislation. These should include robust assurance mechanisms that provide validation and oversight of compliance determinations.

However, with the EUDR, our work is not done. It is crucial to not only focus on compliance but keep a holistic approach to sustainability. Robust certification and verification schemes help companies reduce the use of pesticides, improve waste and water management, reduce emissions, improve agricultural practices, strengthen workers, and ensure a transparent and timely assessment of complaints and grievances, just to mention a few examples.

Emese van Maanen
Managing Director
Proterra Foundation

IDH

Sustainably produced aquaculture is vital for healthy, high-quality food with limited environmental impact, but farmers are rarely rewarded or incentivised to produce in a way that benefits the environment.

IDH brings companies together to set sector-wide initiatives and drive action towards reducing the environmental footprint of aquaculture products through the Aquaculture Working Group on Environmental Footprint.

The Working Group consists of frontrunners in the aquaculture industry, from aquafeed companies to retailers. One of its aims is to better understand the footprint of aquaculture products, such as carbon emissions, freshwater use and water quality, so that hotspots where the negative environmental impacts are highest can be identified along the value chain, and better targeted.

If we are to meet global environmental targets, action must be taken now and requires collaboration across the entire value chain. The Working Group supports companies and their value chains with this process: by working together, companies can co-develop, test and scale solutions and business models that they could not achieve on their own. The added benefit is that results will be comparable between aquaculture products.

If we take land use change as an example of a hotspot, the Working Group will look to see what can be done across the entire value chain to incentivise the producer to pay a higher cost for environmentally friendly feeds. It will also consider what we can learn from other sectors that are already further along in this journey. It's about finding the balance too: installing solar panels may make economic sense, but if we want to really reduce the carbon footprint, then perhaps our focus should be directed towards deforestation instead.

In short, closer collaboration both within and beyond the value chain will lead us to reaching our carbon targets sooner. We are happy that Skretting is joining us on this journey.

Lisa van Wageningen
Program Manager Aquaculture
IDH

6

Chapter 6
Our house in order

Double materiality as the basis for sustainability reporting progress

In anticipation of the sustainability reporting requirements outlined in the Corporate Sustainability Reporting Directive (CSRD), which will be in force for disclosures related to 2025, Nutreco decided to already move forward in 2022 to perform a materiality assessment that took into account the double materiality principle. In 2023, we revised this double materiality assessment on the basis of the latest developments in the CSRD and the feedback of our assurance provider. With that, we are able to share a preliminary double materiality assessment in this Impact Report, which we are using to prepare for the CSRD.

Double materiality in reporting accounts not only for how a company affects the environment and society but also how the environment and society impact the company's financial value. A sustainability topic meets the criteria of double materiality if it is material both from the impact perspective (inside-out) and from the financial perspective (outside-in). We identified key internal and external stakeholders to engage in the different phases of the assessment. We considered a broad representation across geography, business lines and relationships with Nutreco in order to reflect diverse internal and stakeholder perspectives through the process. We gathered input from these internal and external stakeholders about their prioritisation of sustainability topics through in-depth interviews and workshops. We also aligned the financial materiality with our Enterprise Risk Management assessment.

Material topics
This process enabled us to identify two topics that can clearly be considered double material for Nutreco: climate change mitigation and occupational health and safety.

2 double material topics

Climate change mitigation

Occupational Health & Safety

We identified 14 material topics in total, including the two double material topics (priority 1) and six that are building blocks for Nutreco's sustainability strategy (priority 2). The two identified double material topics form the basis of Nutreco's integrated strategy and the topics addressed in this Impact Report.

Priority	Material topics
1	Climate change mitigation Occupational health and safety
2	Animal health and AMR Extraction and use of marine resources Biodiversity degradation through land-use change Equal treatment and opportunities for all – Training and skills development Equal treatment and opportunities for all – Diversity Prevention and detection of corruption and bribery
3	Water consumption in the supply chain Circular raw materials Circular nutrient flows Child labour in the value chain Forced labour in the value chain Animal welfare

Stakeholder engagement

We believe that engaging with internal and external stakeholders is key to ensuring we invest the right focus and effort in continuous improvement and in dealing with the complex issues that face the future of sustainable food. By having active conversations with several stakeholder groups, we benefit from their diverse perspectives as we explore our solutions. We identify our stakeholders as any group or individual that Nutreco and Skretting affects through our activities, products and services who, in turn, may affect our ability to achieve our goals.

Using this definition, we recognise six main stakeholder groups: Employees, government, external platforms for specific sustainability topics, food retail and services, academia and non-governmental organisations (NGOs).

Stakeholder group	Concerns and expectations	How we engage and how often
Employees	What is the company strategy? What is our financial performance? What is the company going to do around cost cutting? Do we need to close our factory? How can I make a (international) career at Nutreco?	Regular (local) town hall meetings Monthly broadcast interviews with leadership Nutranet (intranet) announcements Divisional strategy updates (annual or bi-annual) Annual European Works Council Regular local Works Council
Government	Protection of consumer and animal health	Showing leadership through continuous organisation of and participation in relevant stakeholder platforms, focusing on solutions Launching nutritional solutions
Platforms for specific sustainability topics	Deforestation for commodity production	Developing Soy and Oil Palm Sourcing Policy in alignment with RoadMap 2025
Food retail and foodservice	GHGs and novel ingredients	Engaging with supply chain to increase novel ingredients
Non-governmental organisations (NGOs)	Overfishing ocean species for marine ingredients supply Deforestation for soy commodity production	Engaging in FIPs Collaborating on platforms that address specific concerns
Academia	R&D collaboration and validation of animal performance on circularity, health (AMR reduction) and welfare, and emissions reduction	Setting up or intensifying collaborative projects Engaging with over 80 academic institutions around the world

Global stakeholder platforms

MarinTrust
MarinTrust has become the leading independent business-to-business certification programme for the production of marine ingredients. Skretting is a member of the MarinTrust governance board. The main purpose of the standard is:

- To ensure that whole fish used come from fisheries managed according to the FAO Code of Conduct for Responsible Fisheries
- To ensure no IUU fishery raw materials are used
- To ensure pure and safe products are produced under a recognised Quality Management System, thereby demonstrating freedom from potentially unsafe and illegal materials
- To ensure full traceability throughout production and the supply chain

Sustainable Fisheries Partnership
Skretting is a sponsor of the Sustainable Fisheries Partnership (SFP). This non-profit organisation fills a specific gap between industry and the marine conservation community, utilising the power of the private sector to help less well-managed fisheries meet the environmental requirements of major markets. Their work is organised around two main principles: making available up-to-date information on fisheries for the benefit of major buyers and other fisheries stakeholders, and using that information to engage all stakeholders along the supply chain in fisheries improvements and moving toward sustainability.

Global Salmon Initiative
An important way in which Skretting is helping advance the salmon sector is through its role as an Associate Member of the Global Salmon Initiative (GSI). GSI salmon farmers and feed companies have committed to working pre-competitively together to accelerate progress towards ever-increasing standards of sustainability for the farmed salmon industry, and to driving progressive innovation in the feed sector. Skretting is a proud Associate Member of GSI. Both Skretting and GSI have a shared interest in the continued growth and prosperity of the farmed salmon industry and a shared commitment to improving the sustainability of the sector.

Associate Members work closely with the GSI members on specific projects where shared knowledge and collaborative working will support accelerated progress.

ProTerra Foundation
Skretting is member of the ProTerra Foundation, a not-for-profit organisation that advances and promotes sustainability at all levels of the feed and food production system. A commitment to full transparency and traceability throughout the supply chain and concern for corporate social responsibility and the potential detrimental impact of herbicide-resistant, genetically modified crops on ecosystems and biodiversity is at the heart of everything we do at Skretting. Independent third-party certification is central to the Proterra Foundation. ProTerra certification ensures that high-quality supplies of crops, food, and feed are independently certified and produced with improved sustainability.

Seafood Business for Ocean Stewardship (SeaBOS)
In 2023, Skretting continued to be a key contributor to the Seafood Business for Ocean Stewardship (SeaBOS) initiative. CEOs from the nine largest global seafood companies have joined forces through SeaBOS to create transformative change. The work is divided into five task forces: (1) IUU Fishing & Modern Slavery, (2) Transparency and Traceability, (3) Improving Regulations, (4) Internal Governance and (5) Innovation.

Roundtable on Responsible Soy
Nutreco is a member of the Round Table on Responsible Soy (RTRS), a civil organisation that promotes responsible production, processing and trading of soy on a global level. RTRS encourages the current and future production of soybeans to take place in a responsible manner to reduce social and environmental impacts while maintaining or improving producers' economic status through the development, implementation and verification of a global standard.

Roundtable on Sustainable Palm Oil
Nutreco has been a member in good standing of the Roundtable on Sustainable Palm Oil (RSPO) nearly since its inception. Committed to this multistakeholder platform, we purchase green palm certificates for all our palm oil products, excluding kernel oil.

Global Aquaculture Alliance
Skretting is a member of the Global Aquaculture Alliance (GAA), an international non-profit organisation that promotes responsible aquaculture practices through education, advocacy and demonstration. For over 20 years, the GAA has demonstrated a commitment to feeding the world through responsible and sustainable aquaculture.

It does this by providing resources to individuals and businesses associated with aquaculture and seafood worldwide. They improve production practices through partnerships with countries, communities and companies, as well as through online learning and journalism that has an active readership in every country of the world.

Aquaculture Stewardship Council
Established in 2010, the ASC is a robust and credible environmental/social standard in the farmed seafood sector. Over 1.6 million tons of farmed seafood are currently independently certified according to and compliant with the standard. Nutreco's Sustainability Director sits on the Supervisory Board of the ASC. Skretting is currently a member of the steering committee, overseeing the work related to developing an ASC Feed Standard.

Sustainable Shrimp Partnership
Skretting is a founding member of the Sustainable Shrimp Partnership (SSP), a group of leading companies that share one mission: to make shrimp aquaculture a clean, stable and successful practice for the world. In order to reach that goal, the leaders have set a clear and ambitious plan to elevate the whole sector to the next level.

GlobalGAP
Skretting is member of GlobalGAP, an organisation that has developed criteria for food safety, sustainable production methods, worker and animal welfare, and responsible use of water, compound feed and plant propagation materials. Skretting is also a member of the technical committee that oversees the GlobalGAP aquaculture standard.

European Feed Manufacturers' Federation
Nutreco is a member of the European Feed Manufacturers' Federation (FEFAC) Sustainability Committee, which meets two or three times each year in Brussels, Belgium, to address sustainability initiatives associated with the European feed industry. A positive outcome of this committee was the rollout of the FEFAC Soy Sourcing Guidelines, which outline the minimum criteria that purchasing feed mills could incorporate when making their soybean, soybean meal and soy concentrate purchases.

The North Atlantic Pelagic Advocacy Group
The North Atlantic Pelagic Advocacy Group (NAPA) was created as a sector-wide, multi-stakeholder initiative of partners to build a shared, global and non-competitive solution to complex sustainability issues in the Northeast Atlantic Pelagic fisheries.

NAPA represents retailers, foodservice companies and suppliers from EU and non-EU countries with the shared aim of sourcing sustainable and certified seafood in order to supply a growing demand for eco-labelled fish products.

To achieve this, NAPA is seeking an agreement on total allowable catches for Northeast Atlantic Pelagic fisheries in line with scientific advice, and for a long-term science-based management agreement.

The Global Roundtable on Marine Ingredients
Skretting is a member of the Global Roundtable on Marine Ingredients, founded in 2021. The initiative aims at taking action based around the framework of the UN Sustainable Development Goals. In addition, it works to provide a single value chain contact point to contribute to existing platforms aimed at ensuring sustainable management of fisheries providing marine ingredients. The Roundtable will foster and support precompetitive efforts by members to:

- Identify and agree on ways to further improve the availability of sustainable marine ingredient materials
- Investigate the potential of new raw material sources, such as mesopelagic species and others
- Catalyse and support existing and new FIPs
- Understand and address urgent social issues and enhance social responsibility in key fisheries and regions
- Maintain a global overview of the state of the resources and industry

The first priority for the Roundtable is West Africa, where the production of marine ingredients (both direct and through by-products) has grown dramatically over the last decade, and a number of economic and social challenges have been identified. Southeast Asia is another geographic priority, where multispecies fisheries pose unique management challenges, and some fisheries are tainted by human rights and labour abuse. The Roundtable will also address other important topics, such as LCAs and potential new raw material sources.

IDH – the Sustainable Trade Initiative
IDH catalyses positive change by bringing together committed stakeholders from across global markets to create better jobs, better incomes, a better environment and gender equality for all. Through its approach of convening, co-creating and co-financing, IDH addresses critical challenges in value chains, such as deforestation, working conditions and wages, value distribution and climate change.

IDH facilitates a pre-competitive Aquaculture Working Group, consisting of companies that can prioritise issues, start projects, create a methodology, start reduction projects and learn together. The aim of the group is to better measure and reduce the environmental footprint of aquaculture. By working together, companies can co-develop, test and scale solutions that they could not achieve on their own, with the added benefit that results will be comparable with other supply chains, aquaculture products and proteins.

Health, safety and environment (HSE)

At Skretting and our parent company Nutreco, our unwavering commitment to the well-being of our employees, contractors, visitors and the communities we serve stands at the heart of everything we do. This dedication not only reflects our core values but also our relentless pursuit of a culture where safety and security are paramount. In the past year, we have not only maintained but intensified our focus on creating a safe working environment characterised by continuous improvement, trust and collaborative effort. Placing health and safety at the core of our business operations and decision-making processes has yielded significant advancements, notably in the reduction of workplace accidents and the enhancement of our workforce's safety competencies.

Skretting's key HSE achievements in 2023:

Building on the solid foundation laid in 2022, our initiatives in 2023 have included:

1
Structural enhancement of HSE organisation: We have successfully finalised the HSE organisational structure, ensuring direct reporting lines to the heads of each entity for 100% of our HSE personnel. This change underscores our commitment to integrating health, safety and environmental considerations at the highest levels of decision-making.

2
Lifesaving rules awareness: We ran a comprehensive campaign to raise awareness among all employees about the critical importance of adhering to life saving rules, reinforcing our commitment to safeguarding lives.

3
Hazard reduction focus: Across all our operations, we have championed a hazard reduction initiative, aiming to proactively identify and mitigate potential safety risks, ensuring a safer working environment for everyone.

4
Operational and HSE alignment: Our efforts to synchronise operational practices with HSE initiatives have fostered a more integrated and cohesive approach to safety and environmental management.

5
Dust explosion risk reduction: Recognising the significant risk posed by dust explosions, we have formulated and begun implementing a comprehensive three-year plan to mitigate this hazard and ensure full compliance with safety standards.

6
Lifesaving rules programme rollout: Preparation is underway for the launch of a two-year programme to roll out our lifesaving rules, marking a major step forward in our journey towards achieving exemplary safety standards.

Skretting HSE in numbers:

- Accident reduction:
  For the second consecutive year, we have achieved a significant reduction in the Total Recordable Case Frequency (TRCF), which decreased by 16% to 1.61 per 200,000 hours worked by the end of 2023. This milestone reflects our collective efforts to protect our workforce and create a safer work environment.
- Skill enhancement:
  45 HSE specialists were empowered through training to obtain the National Examination Board in Occupational Safety and Health International Certificate and 107 plant managers, maintenance managers and operational managers passed the Institution of Occupational Safety and Health Certification, elevating our collective expertise in health and safety management.
- Training success:
  Our ambitious plan encompassed 8,025 HSE training sessions, achieving an impressive 99.5% completion rate, which speaks volumes about our commitment to continuous learning and development.
- Audit compliance:
  We successfully closed 70% of HSE audit compliance gaps on time by year-end, with only 14 overdue out of 51 identified gaps, demonstrating our dedication to maintaining high standards of safety and compliance.

Alexandre Bolay
HSE Director
Nutreco

Building a safer warehouse at Skretting Spain

Skretting Spain has built an efficient and secure warehouse, allowing people to carry out their work in an environment where risks are eliminated or minimised as much as possible, using the most innovative technologies available.

A semi-automatic storage rack system that uses motorised shuttles to transport the load autonomously inside the racking improves operator safety, greatly optimises storage, and improves productivity.

The forklift fleet is equipped with some innovative improvements, such as the pedestrian alert system, which warns pedestrians and forklift drivers when it detects pedestrians at a two-meter distance, and the low-speed area system, which automatically limits the speed at which forklifts circulate in different areas, such as loading docks.

Warehouse safety also includes advanced automatic fire extinguishing systems, such as an aspirating smoke detection system, automatic fire doors, and an automatic smoke and heat extraction system that allows extractions to be opened automatically when smoke is detected.

Beyond technical measures, we are working on the team's safety behaviours and culture through training, regular inspections and gemba walks, to ensure we're successful in this very important focus area.

Alberto Martínez de Pedro
HSE Responsible
Skretting Spain

Ethics and Compliance

While business results are crucial to us, the means by which we achieve those results are equally significant. We have a zero-tolerance policy for behaviour that contradicts our values, legal requirements, and company policies.

In 2023, trade sanctions further increased in response to the Russian war against Ukraine. As early as 2022, we had ceased selling products to Russia, and in 2023, Skretting continued to uphold this policy.

Skretting continued to prioritise creating awareness of ethics and compliance (E&C) topics. This ensured that employees possessed the necessary knowledge to perform their roles ethically and in alignment with regulations. By year-end, approximately 98% of the Skretting target audience had received training on our Code of Conduct. We also conducted risk assessments and training activities, focusing on areas covered by our Competition Law Compliance and Anti-Bribery and Corruption policies.

Collaborating with Shift, a leading centre of expertise on the UN Guiding Principles on Business and Human Rights, we assessed the salient human rights issues related to our company. The results of this assessment inform our ongoing efforts to enhance human rights risk management. Furthermore, our E&C and Sustainability departments jointly supported Skretting Chile in achieving certification under the demanding ASC Feed standard for aquaculture. This standard considers productivity, environmental impact and social factors. Our support included updating the Code of Conduct for Business Partners and expanding the Skretting website to include a detailed explanation of Speak Up, our company's whistleblower and grievance mechanism, which is open to internal and external stakeholders.

Throughout our various business units and at our head office, we remained committed to enforcing the right behaviour. In 2023, this commitment involved investigating ten Speak Up cases at Skretting and taking appropriate action.

Johan Gerrits
Ethics & Compliance Director
Nutreco

> We have a zero-tolerance policy for behaviour that contradicts our values, legal requirements, and company policies.


SKRETTING
a Nutreco company

Chapter 7
About Skretting

About Skretting

The vision that inspires us

Together with our customers, suppliers and partners, we lead innovation to ensure access to more sustainable, healthier and safer seafood for the world's growing population.

Our purpose

Feeding the Future continues to be a meaningful purpose for us at Skretting. We hope that you see why after reading this report!

The values we live by

We updated our company-wide values in 2022. The new values of trust, inclusivity, curiosity, integrity and passion reflect our purpose of Feeding the Future and underpin our fundamental beliefs and the guiding principles of how we do business.

Our people

The collective experience, knowledge and talents of our people have helped us achieve considerable success while also progressing the aquaculture industry on a global scale. We strive to be the company where the best people in the industry want to work. We are an equal opportunity employer; people are considered for all roles without regard to race, colour, religious creed, gender identity, nationality, citizenship status, age, physical or mental disability, sexual orientation, marital, parental or military status, or any other status protected by applicable local law.

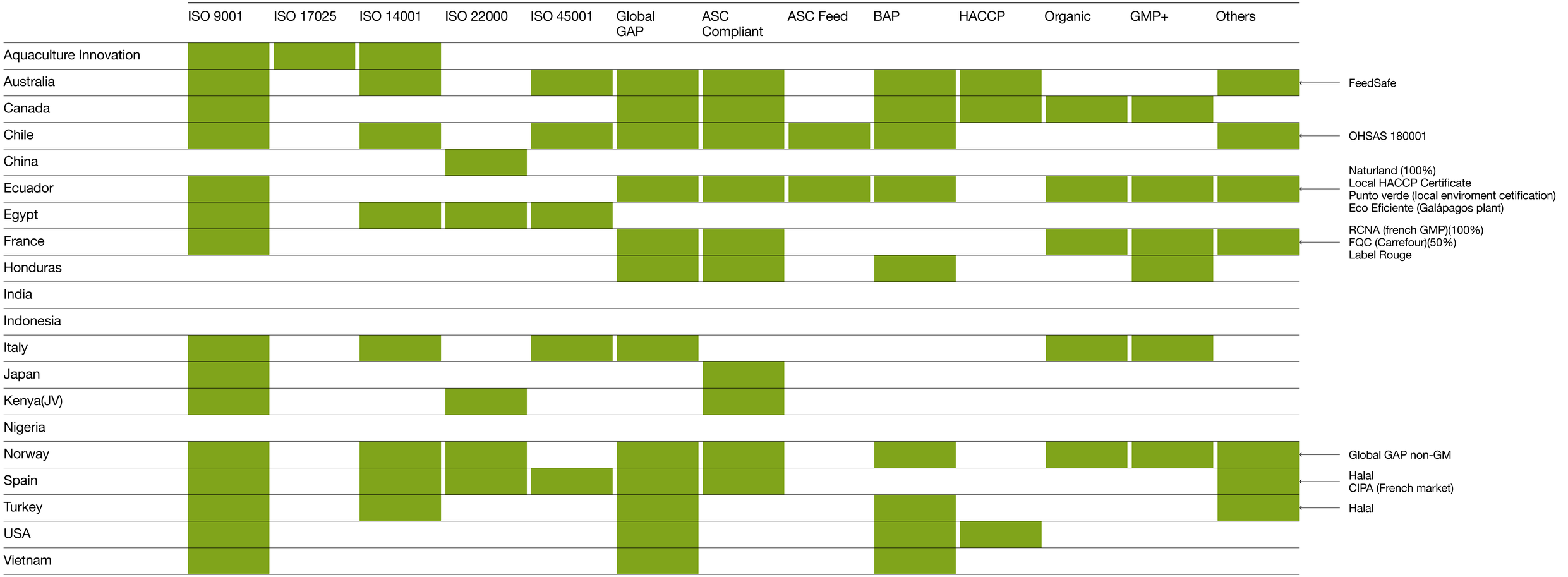
Governance

Nutreco's Sustainability function is led by the company's CEO. In 2023, Nutreco appointed a new Corporate Sustainability Director reporting to the Chief Supply Chain Officer, who represents sustainability on the Management Board.

Nutreco's Sustainability Director chairs the Nutreco Sustainability Platform (NSP), which is where the sustainability aspects of our strategy are developed, and where sustainability issues are addressed. It is made up of five individuals, three of whom represent the businesses. The functional directors within the Trouw Nutrition and Skretting business lines are responsible for the implementation of sustainability activities aimed at achieving the targets set out in RoadMap 2025, working with teams in our businesses throughout the world.

Nutreco Corporate Sustainability Governance

Our certifications



Our global operations

01
Netherlands

P.O. Box 234,
5830 AE Boxmeer,
The Netherlands

02
Australia

26 Maxwells Road,
Cambridge
Tasmania, 7170

03
Canada,
St. Andrews

St. Andrews 48
Moore Clark Dr,
St. Andrews, NB,
Canada

04
Canada,
Vancouver

Vancouver 1370
East Kent Ave S,
Vancouver,
V5X 2Y2

05
Chile

Camino a Pargua
1001 Puerto Montt,
Casilla 201,
Chile

06
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No. 2016
Huangyang
Avenue, Longshan
Industrial Park,
Doumen District,
Zhuhai Guangdong
China

07
Ecuador

Km. 6.5 vía Durán-
Tambo, Durán
Ecuador

08
Egypt

Plot 170, 10th of
Ramadan Rd.,
Belbis, Sharkia
Egypt

09
France

24, Le Pont de
Pierre 02140
Fontaine les
Vervins, France

10
Vietnam

Tan Tao Industrial
park, Lot 22A,
Road # 1 Binh
Chanh District
Ho Chi Minh City,
Vietnam

11
India

Unit No: L4 04, SLN
Terminus, Survey No.
133, Beside Botanical
Gardens, Gachibowli,
Hyderabad – 500032
India

12
Indonesia

PT Trouw Nutrition
Trading Indonesia
MM2100 Industrial
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A3-2, Cikarang Barat,
Bekasi 17530,
Indonesia

13
Italy

Frazione San Zeno
37060 Mozzecane
(Verona), Italy

14
Japan

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Hakataeki-Higashi
Chome Fukuoka,
812-0013, Japan

15
Nigeria

KM6 Old Lagos Road,
New Garage, Ibadan
Nigeria

16
Norway

Sjøhagen 6,
4016 Stavanger
Norway

17
Spain

Cojobar, Burgos,
09620 Spain

18
Turkey

Ekinanbarı Mah.
Kocakısla Sokak No:5
Güllük-Milas, 48670
Mugla, Turkey

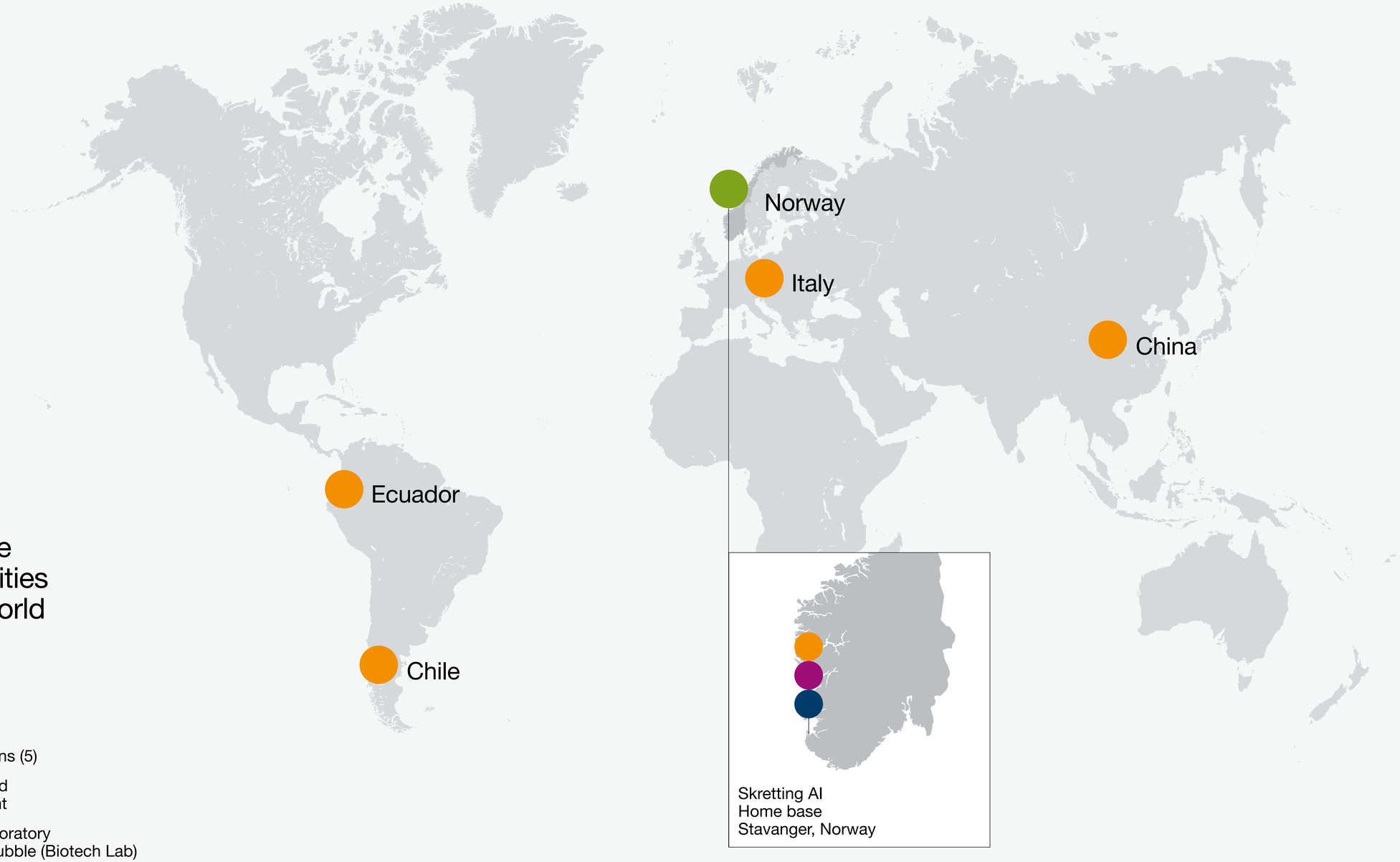
19
USA

Salt Lake City 720
East 2400 North,
Tooele, Utah
84074-3476, USA

20
Honduras

San Francisco de Yojoa,
Cortés

Our global validation stations



Main in-house research facilities around the world

- Skretting AI Head Office
- Skretting AI Research Stations (5)
- Skretting AI Feed Technology Plant
- Skretting AI Laboratory and Skretting Bubble (Biotech Lab)

skretting.com

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