



2022 Green Bond Impact Report

April 2024

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Green Bond Impact Report

In accordance with the SpareBank 1 Nord-Norge (“SNN”) Green Finance Framework 2021, this document provides:

- 1 A description of Green Loans
- 2 The breakdown of Green Loans by nature of what is being financed
- 3 Metrics regarding Green Loans’ environmental impacts

1 Description of Green Loans

SNN intends to allocate the net proceeds of the green finance instruments to a portfolio of new and existing loans in the following categories:

- **Green Buildings**
- **Renewable Energy**
- **Clean Transportation**
- **Environmentally Sustainable Management of Living Natural Resources and Land Use**

Eligibility Criteria to select the Eligible Green Loan Portfolio are set out in the SNN Green Finance Framework¹. Such Eligibility Criteria are aligned on a best-efforts basis with the criteria in the EU Taxonomy Climate Delegated Act² for relevant sectors.

SNN has relied on the support of an external consultant (Multiconsult ASA) to provide the impact calculations and output for the following categories: Green Buildings, Renewable Energy and Clean Transportation.

2 Breakdown of Green Loans by nature of what is being financed

100% Financial Assets

3 Metrics regarding Loans’ environmental impacts

Portfolio-based reporting is prepared taking into account the ICMA Handbook Harmonized Framework for Impact Reporting (version June 2023)³.

¹ See [here](#) for 2021 SNN Green Finance Framework

² To be found [here](#)

³ To be found [here](#)

Impact overview

Portfolio date: 31 December 2022

Eligible Project Category	Eligible Project Subcategory	Eligible portfolio (NOK m)	Share of Total Financing	Eligibility for Green Bonds	Estimated reduced energy (in GWh/year)	Expected renewable energy produced (GWh/year)	Direct emissions avoided vs baseline in tons of CO ₂ /year (Scope 1)	Indirect emissions avoided vs baseline in tons of CO ₂ /year (Scope 2) ⁴	Estimated annual reduced emissions (tons of CO ₂ /year)	% of fishery stocks with biomass at or above sustainable levels	Other qualitative relevant KPIs
a/	b/	c/	d/	e/	f/	f/	f/	f/	f/	f/	f/
Green Buildings	Residential	6,786	42.7%	100%	59.5 ⁵	/			6,830 ⁵	-	-
	Commercial	3,188	20.1%	100%	51.4 ⁶	/			5,906 ⁶	-	-
Renewable Energy	-	1,325	8.3%	100%	/	860	/	/	108,944	-	-
Clean Transportation	-	936	5.9%	100%	/	/	2,202	-901	1,301	-	-
Environmentally Sustainable Management Of Living Natural Resources And Land Use	Fisheries (MSC Certification)	857	5.4%	100%	/	/	/	/	N/A	+ 22.0% vs Norway	See appendix
	Aquaculture (ASC Certification and GlobalG.A.P.)	2,797	17.6%	100%	/	/	/	/	0.28 (vs chicken) 0.7 (vs Pork) 5.32 (vs beef) ⁷	-	See appendix
Total		15,890	100%	100%	110,8	860	2,202	-901	122,981⁸	+ 22.0% vs Norway	

Portfolio based Green Bond report prepared taking into account the ICMA Handbook Harmonized Framework for Impact Reporting (version June 2023)

a/ Eligible category under the ICMA Green Bond Principles and LMA Green Loan Principles

b/ Eligible sub-category

c/ Signed amount represents the amount legally committed by the issuer for the portfolio or portfolio components eligible for Green Bond financing, a portfolio of projects or component that is/are eligible for green bond financing

d/ This is the share of the total portfolio that is financed by the issuer

e/ This is the share of the total portfolio costs that is Green Bond eligible

f/ Impact indicators:

- Estimated reduced energy (in GWh/year)
- Estimated renewable energy produced (GWh/year)
- Direct and indirect emissions avoided in tons of CO₂/year (Clean Transportation only)
- Estimated annual reduced emissions in tons of CO₂/year
- % of fishery stocks with biomass at or above sustainable levels

Note: for certification schemes, the impact is shown at certification level rather than SNN portfolio level due to data availability

⁴ Indirect emissions avoided are based on EU power production mix as a baseline. This is a more conservative approach than Norwegian power production mix as a baseline, which is also reported in Multiconsult's impact report

⁵ Reduced energy scaled by bank's engagement is 26.5GWh/year, Reduced CO₂ emissions scaled by bank's engagement equates to 3,043 tons CO₂/year

⁶ Reduced energy scaled by bank's engagement is 28.5GWh/year. Reduced CO₂ emissions scaled by bank's engagement equates to 3,268 tons CO₂/year

⁷ CO₂ intensity avoided for fish farming compared to other protein sources (g CO₂eq per typical serving (40g))

⁸ Value does not include CO₂ intensity avoided for fish farming compared to other animal protein sources

i. Green Buildings

Methodology note

Energy efficiency of this part of the portfolio is estimated based on calculated energy demand dependent on building code and EPC labels.

To calculate the impact on climate gas emissions, the decreasing trajectory toward 2050 is applied to all electricity consumption in all buildings. Electricity is the dominant energy carrier to Norwegian buildings, but the energy mix also includes bio energy and district heating, resulting in a total specific emission factor of 115 gCO₂eq/kWh. A proportional relationship is expected between energy consumption and emissions.




All buildings-related impact figures have been calculated by specialist consultant Multiconsult – see SNN's Green Bond website for the full methodology report, [available here](#).

Green Residential Buildings

Impact is calculated based on the following number of objects and total area:

Category	Number of units	Area qualifying buildings in portfolio [m ²]
Apartments	1,756	131,303
Small residential houses	1,778	309,473
Total	3,534	440,776

The table below indicates how much more energy efficient the eligible part of the portfolio is compared to the average residential Norwegian building stock. It also presents how much the calculated reduction in energy demand constitutes in CO₂-emissions:




Category	Area total [m ²]	Reduced energy vs baseline	Reduced CO ₂ emissions	Contribution to SDG
Eligible portfolio of residential buildings	440,776	59.5 GWh/year	6,830 tons/year	  

Green Commercial Buildings

Impact is calculated based on the following number of objects and total area:

Category	Area total [m ²]
Office buildings	35,090
Retail/commercial buildings	179,054
Hotel and restaurant buildings	23,878
Industry and small warehouse buildings	183,872
Total	421,893

The table below indicates how much more energy efficient the eligible part of the portfolio is compared to the average commercial Norwegian building stock. It also presents how much the calculated reduction in energy demand constitutes in CO₂ emissions:

Category	Area total [m ²]	Reduced energy vs baseline	Reduced CO ₂ emissions	Contribution to SDG
Eligible portfolio of commercial buildings	421,893	51.4 GWh/year	5,906 tons/year	  

ii. Renewable Energy

Methodology note

All power produced by renewable energy power stations in the portfolio are in hydropower stations with capacities in the range of 2-23 MW (small hydropower plants) and wind power plant with capacity of 7-41 MW.

For the type of assets in the portfolio, with many run-of-river and small hydropower assets, the AIB (the Association of Issuing Bodies) emission factor is regarded as conservative in impact an assessment setting. The positive impact of the hydropower assets is 130 gCO₂/kWh compared to the baseline of 136 gCO₂/kWh.



The equivalent emission factor for wind power is by AIB set at 20 gCO₂/kWh. The positive impact of the wind power assets in SpareBank 1 Nord-Norge's portfolio is then 116 gCO₂/kWh compared to the baseline of 136 gCO₂/kWh

All energy-related impact figures have been calculated by specialist consultant Multiconsult – see SNN's Green Bond website for the full methodology report, [available here](#).

The eligible plants in SNN's portfolio are estimated to have the capacity to produce about 971 GWh per year. The table below shows the capacity and production of eligible hydropower plants (HPP), estimated, and expected production:

Category	No. Of plants	Capacity [MW]	Total capacity [MW]	Estimated production [GWh/year]	Expected production [GWh/year]
Small hydropower	57	2-23	247	767	656
Wind power	3	7-41	60	204	204
Total	60	/	307	971	860

The table below summarises the expected renewable energy produced by the eligible assets in the portfolio in an average year, and the resulting avoided CO₂-emissions the energy production results in:

Category	Produced power compared to baseline (GWh/year)	Reduced CO ₂ -emissions compared to baseline (tons CO ₂ /year)	Contribution to SDG
Eligible hydropower plants in portfolio	656	85,303	 
Eligible wind power plants in portfolio	204	23,641	
Total	860	108,944	

iii. Clean Transportation

Methodology note

The impact of electric vehicles in Norway on climate gas emissions is assessed in the following manner. The bank's portfolio regarding is assessed direct emissions (Scope 1) and indirect emissions related to electric power production (Scope 2).



A baseline is established as the emission of the average vehicle of the total new introduced vehicle to the market, EV's excluded.

All transportation-related impact figures have been calculated by specialist consultant Multiconsult – see SNN's Green Bond website for the full methodology report, [available here](#).

Passenger and light duty vehicles are included in the Clean Transportation category. The number of eligible vehicles as well as the expected yearly mileage can be found below:

Category	No. of vehicles	Sum distance [km/year]	Sum distance [pkm/year]
Passenger vehicles	2,980	26.5 million	45.1 million
Light duty vehicles	62	0.7 million	1 million
Total	3,042	27.2 million	46.1 million

The table below summarises the reduced CO₂-emissions compared to baseline for the eligible assets in the portfolio in an average year in the lifetime of the vehicles in the portfolio, presented as reductions in direct emissions and indirect emissions:

Category	Reduced CO ₂ -emissions compared to baseline (tons CO ₂ /year)	Contribution to SDG
Total Direct emissions only (Scope 1)	2,202	 
Total Indirect emissions EV's only (Scope 2)	-901	
Total Avoided emissions	1,301	

The reduction in direct emissions from the vehicles in the portfolio corresponds to 920,000 litres of gasoline saved per year.

iv. Impact of Environmental Certification Schemes

Fisheries - MSC

Comment

The impact description and data for the MSC certification were delivered by MSC. A combination of quantitative and qualitative (through case studies) impact assessment is provided in this section.

Context and background on MSC certification

Fisheries and associated business represent work and income for an estimated 260m people, 2.4 billion people are dependent on seafood as their prime source of animal protein. Simultaneously the UN food and Agricultural Organisation (FAO) estimates that 35.4% of stocks for which data is available in abundance is in an overfished state. The proportion of overfished stocks is growing over-time. Ecosystem and fish stock collapse has profound impacts on global food security, jobs and trade. Root causes for the dire situation of many fisheries are poor fisheries management, where public authorities legally allow more fishing than scientifically recommended; poorly controlled fisheries leading to Illegal, Unreported, Unregulated (IUU) activities; and/or failure to effectively share marine resources across borders when stocks migrate internationally. Overcapacity in global fishing fleets relative to the ability of stocks to replenish themselves remains one of the biggest drivers of this problematic situation.

The MSC

The Marine Stewardship Council (MSC) is a global, mission driven not for profit organisation aiming to contribute to the health and recovery of marine resources, for all that depends on it. The MSC is the world leading standard setter for sustainable wild capture seafood, and is a public education charity registered in the UK and active in 22 countries via its branch offices, with projects in 100 countries.

The MSC developed, owns and maintains the worlds most recognised and credible global sustainability standard for wild capture fisheries. It also developed, owns and maintains a Chain of Custody standard to assure that MSC certified seafood can be traced back to the certified source. Finally, the MSC owns an eco-label which retailers and brands can use at a voluntary basis on seafood products.

The MSC program is the worlds most used independent credible verification of sustainability of wild caught seafood. It was recognised as a key indicator by the UN convention on Biological Diversity, as well as in the preparatory papers for the UN Sustainable Development Goal (SDG) nr 14 'Life Below Water' as a credible benchmark which governments and companies could use to measure and track sustainability performance.

The global fisheries sustainability challenge and finance

Capital is a key driver of capacity to fish, process, trade seafood. Ideally access to capital and financial services is cheaper and easier for companies operating in sustainable well managed fisheries, or trading seafood from sustainable fisheries. Capital and financial services for entities engaged in fishing, processing or selling seafood from origins

which is not demonstrably sustainable, should only be available under strict, independently verified and time-bound, recovery conditions.

SNN issued its first green bond in 2021. It was an important milestone for the sustainability of fisheries. This initiative does not just deliver added value in Norway for companies demonstrably harvesting, processing and selling sustainable seafood, it sets a pathway for the finance industry. It shows that the finance community starts recognising its responsibility, and that it has a fundamental role to play to drive a turnaround of what today is still an unsustainable production and consumption system in many places.

Status update on Fisheries: MSC in Norway and the world

Globally wild-capture fisheries legally harvested an estimated 90,3 million metric tons in 2020⁹. A proportion of Ca. 15% of global catch is certified against the MSC standards for sustainable fishing.

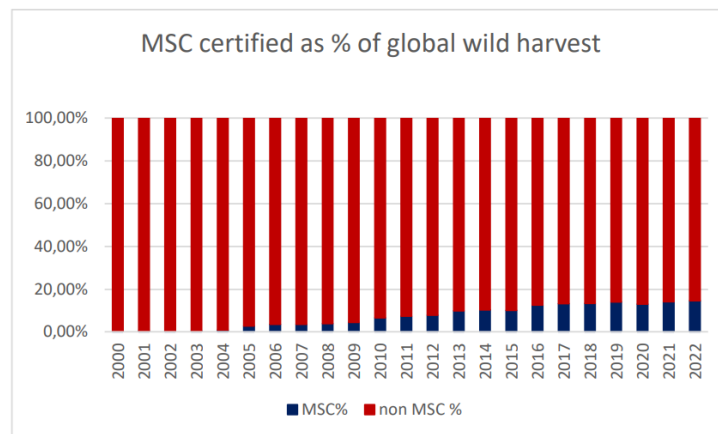


Figure 1: Global catch and estimate % in MSC program as certified

The fisheries making up this 15%, represent the best managed part of the global fishing industry. Looking at engagement in the MSC program from a worldwide perspective, figure 2 below shows there is a long way to go in the majority of the world:

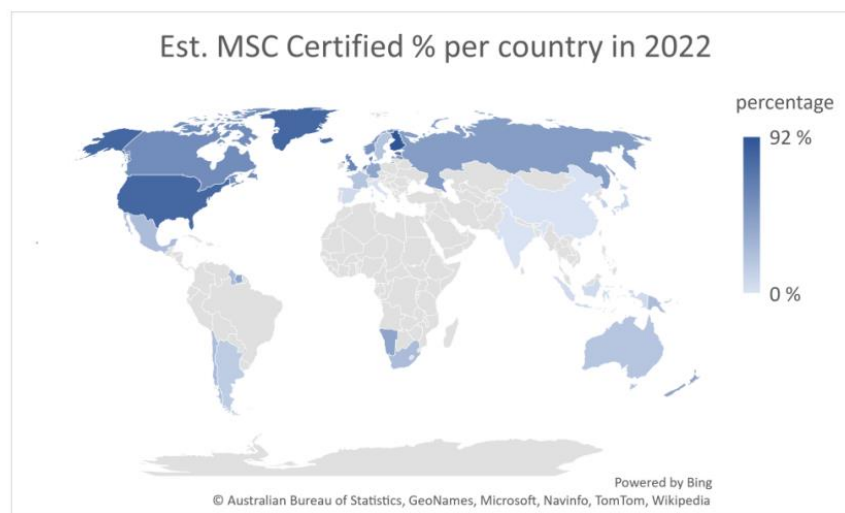


Figure 2: estimated % of catch MSC certified per country, Norway has Ca. 88% of its harvest MSC certified in 2020

⁹ FAO data, extracted from FAO Figis database for last year available (2020). Illegal Unreported and Unregulated fishing not counted in. Marine mammal catch not included, and neither Miscellaneous aquatic animals or plants. [FIGIS - Fisheries Statistics - Capture \(fao.org\)](#) and [FIGIS - Time-series query on: Capture \(fao.org\)](#)

100% of stocks of MSC certified fisheries in Norway have sustainable biomass, 78% of all key stocks fished are estimated to have sustainable biomass in Norway in total. 64,6% of stocks have sustainable biomass worldwide. Norway is thus doing better than the rest of the world, and stocks of its most important commercial species certified against the MSC standards in good condition. It is important to note that for some stocks where biomass is currently estimated as low by science, management has set lower quota, or even closed the fisheries to enable stock recovery.

What is also important is that sustainable fishing entails much more than just high biomass. Impacts of the fishery on the wider environment, the amount of fish taken from a stock, compliance with regulation (legality) and the capacity – and acting – of authorities to manage the fisheries' impacts, all play a key role too. MSC certification covers all these aspects, and annually tests through its 3rd party assurance system if performance is (and has remained) sound.

Use of MSC in Norway

The MSC standards are effectively used by fisheries in Norway to demonstrate sustainability. Table 1 below shows that Norway is ahead of the global performance, in terms of being able to demonstrate independently that fisheries are meeting the MSC standards.

The MSC standards are effectively used by fisheries in Norway to demonstrate sustainability. Table below shows that Norway is ahead of the global performance, in terms of being able to demonstrate independently that fisheries are meeting the MSC standards. MSC certification signifies high sustainability performance.

Indicator	Norway	World ex-Norway	World
<ul style="list-style-type: none"> Seafood volume covered by MSC certification in 2021 	1 306 953	11 670 866	12 977 819
<ul style="list-style-type: none"> % of seafood volume (wild catch) covered by MSC certification in 2022, out of the total volume of seafood (wild catch) produced 	51,3 %	13,3 %	14,4 %
<ul style="list-style-type: none"> Number of fisheries covered by MSC certification in a particular year out of the total number of fisheries in the MSC program. 	80	1324	1404
Indicator	MSC certified in Norway	All key stocks in Norway	World
MSY or higher (% of stocks with biomass at or above sustainable levels)	100,0 %	78,0 %	64.6 %
< MSY	0,0 %	22,0 %	35,4 %

Table 1

MSC certification signifies high sustainability performance. Table 2 shows the assumed 'certification benefit', based on the likelihood that a randomly picked fish stock in Norway was at sustainable level (MSY or higher) in 2022. The % of healthy stocks was significantly higher for stocks covered by MSC certification (100%) vs 'all key stocks in Norway' (78%) or the 'world' (64.6%). That implies a 22% difference between MSC Norway and non MSC Norway, and a 35.4% difference between MSC Norway and the world.

MSC certification benefit	
Difference MSC Norway with world	35,4 %
Difference MSC Norway with non MSC Norway	22,0 %

Table 2

Impacts with MSC in Norway in 2022

In a global context, fisheries management in Norway is functioning comparatively well. Yet, even in a well-off state like Norway improvements are needed in fisheries management. Operationally, fisheries can on many occasions reduce impacts to assure sustainability thresholds are not exceeded.

The MSC standards are used as a tool to identify where such improvements are needed. Recognition of Norwegian fisheries as MSC certified, delivers value from the market to these fisheries, and creates incentives to make improvements. This is MSC's Theory of Change (ToC) 'in practice'.

Certified fisheries in Norway have 15 'open' conditions for improvement in the MSC program (medio 2023), and in 2022 10 conditions for improvement were closed¹¹. A case study below shows one example of an improvement being made over recent years.



Case study: Norwegian Fishermen's Association and the Institute of Marine research contribute to better regional management of inshore cod stocks

Norwegian cod fisheries have long been the most important economic fishery in the country, given jobs and income over generations to thousands of fishermen, as well as onshore processors, exporters. Cod fishing in Norway is mostly based on catches from a cod stock which migrates between the Barents Sea (feeding) and the Norwegian coast (spawning). This is the Northeast Arctic Cod stock, the largest cod stock in the world. Besides that, some of the cod catches in Norway originate from cod populations that do not migrate as far, and which live-reproduce in areas closer to the Norwegian coast. This is the 'Norwegian coastal cod'.

The healthy stock status, well documented and limited environmental impact and good management of the 'offshore cod' fisheries enabled it to demonstrate compliance with the MSC standard for sustainable fishing since 2010. This was however not without considerable conditions for improvement in a number of areas. For example conditions were set related to 'better protection of habitats' to minimize impacts on sensitive benthic communities (cold water corals, sea pens); for some gears such as 'gill nets' minimizing impacts on species that were occasionally accidentally bycaught – such as harbor porpoises. The Norwegian fishermen's association, scientific and management stakeholders have over the years successfully collaborated to make progress and close these conditions. Another key improvement was expected for the management and for recovery of stock status of coastal cod, which populations were believed to be in a poor state.

The understanding was based on a series of annual coastal surveys, estimating population trends over time, as well as an index of estimated catches – based on sampling and DNA sequencing of cod sampled – in the fisheries in the areas close to the Norwegian coast. This gave the science institute good generic understanding about the abundance and trends, but there were many uncertainties in the estimates, and the systematic measuring only stretched back a few decades. Thus, a full analytical stock assessment was not possible for coastal cod. Nevertheless, based on the knowledge available a 'limit biomass' reference point was chosen for the coastal cod. This was served as a key indicator for management actors. Given the estimation that the coastal cod stock was below the precautionary biomass point, fishing pressure in the coastal zone needed to be reduced. Over the years a whole series of management measures was adopted, including area closures to protect spawning populations of coastal cod, an increased minimum landing size. However, the stock didn't seem to respond to these

¹¹ Extracted from MSC Fisheries data hub 17-05-2023

measures. It didn't rebuild to higher levels, remained rather stable, in a position where it was believed to be below the precautionary reference point.

In absence of a more detailed understanding, the perceived 'low level of coastal cod' caught in the fisheries in the inshore areas, led to an inability for these coastal fisheries to maintain MSC certification in 2021. There was insufficient evidence that the stock was not overfished. This loss of MSC certification, in combination with a longer-term ambition of Norwegian management and scientific stakeholders to develop a better understanding of coastal cod to enable stock recovery, drove a review process of the 'stock status of coastal cod'. Ultimately this 'benchmarking process' aimed to develop a better understanding and build better management on that to promote stock rebuilding. The outcomes of the research imply that for the purpose of management two coastal cod stocks could be defined. One in the North (N. of 67 degrees) and one in the south of Norway (N. of 62 – S. of 67 degrees). Modelling showed these two populations to be in different states. The coastal cod stock in the north showed a stable or somewhat upward trend since ca. 1998, with biomass at levels considered healthy. The stock in the south is less well understood, yet this is believed to be in a stable condition as well.

The renewed understanding of the coastal cod population status, and the redefinition of a single stock into two discrete stocks for management purposes, provided an evidence base that is now used to re-assess the Norwegian coastal fisheries for cod against the MSC standard. This is anticipated to complete in summer 2023. There is some confidence that the new management approach will enable certification, and that better more focused management on coastal cod can promote higher stocks.

Challenges in Norway in 2022

While the overarching MSC ToC works, and the Norwegian fishing industry addressed conditions to deliver sustainability improvements, during 2022 the MSC also observed non-addressed challenges in Norway's fisheries (management) performance.

In 2022, the combined individual quotas for mackerel, Atlanto-scandian herring and blue whiting continued to exceed ICES advice by 27%, 31% and 23% respectively. This is not compatible with best practice fisheries management, nor deemed sustainable in the long run. As a consequence, the majority of Norway's pelagic fisheries were either suspended or lost their MSC certificates.

These stocks remain in ok condition, and blue whiting is even growing due to high year-classes entering the stock, yet if this problem is not addressed soon, it can create major risks for the ability of these stocks to remain productive in the years ahead. Reduced productivity and associated reduced catching opportunities would inevitably affect the livelihood and business of many (companies) in Norway.

Companies involved in catching, processing and exporting these pelagic species in Norway, will also face increasing risks for their reputation and may experience serious impacts in the market¹². A broad group of retailers and brands in Europe have made it clear that if the problems are not resolved, and sustainable management is not delivered in specified timeframes, these actors would reconsider their purchasing decisions of herring, mackerel and blue whiting.

Another major challenge persisted in the fisheries for Northeast arctic cod in the coastal zone. Bycatch of cod from coastal populations deemed in a fragile state is high, and recovery measures do not seem to work yet. That led to the expiry of the certification for the inshore fisheries of cod in Norway in 2021.

¹² [Supply chain condemns Norway unilateral quota for mackerel - NAPA \(thefishingdaily.com\)](#) & [MSC: New ICES advice shows northeast Atlantic pelagics over-exploited once again - Undercurrent News](#)

Aquaculture - ASC

Comment

Due to lack of quantitative data, the impact of ASC certified salmon farming is prepared in a qualitative manner. The Environmental non-conformity analysis provided by ASC in its first Impact Report is the first step in collecting and disclosing actual measurements of indicator performance data, for certified farms.

This section is curated based on the data delivered by the Aquaculture Stewardship Council and [ASC website](#).

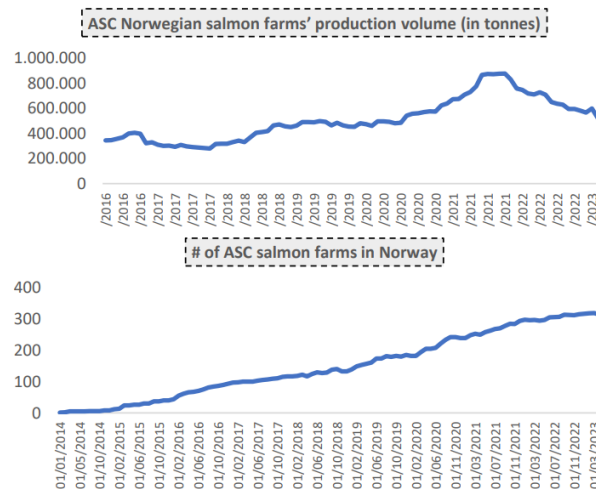
Context and background on ASC certification

Fish happens to be one of the most efficient converters of feed into high quality food, it has a lower carbon footprint and uses fewer resources than other animal production systems¹³. However, traditional methods of wild capture fishing can't possibly meet the demand. Fishing resources are finite and 86%¹⁴ of marine fish stocks are either fully exploited or overfished. Even with sustainable practices, marine fishing has reached the limit of its supply.

The Aquaculture Stewardship Council (ASC) is an independent non-profit labelling organisation that establishes protocols on farmed seafood while ensuring sustainable aquaculture. The ASC provides sustainable and responsible aquaculture producers with a stringent certification and labelling scheme guaranteeing to consumers that the seafood they are purchasing is sustainable for the environment, and socially responsible.

ASC in Norway for salmon farming

ASC certified Norwegian salmon yearly production volume as per May 2023 stood at 518,922 tonnes. The production volumes are derived from when the farm is third party audited, and takes into account factors such as the current biomass, the last harvest volume, and the hectare area of the cages.



The number of ASC certified salmon farms in Norway amounted to 321. Certified farms in Norway can be found on ASC website¹⁵.

¹³ Source: Béné, C., Barange, M., Subasinghe, R. et al. Feeding 9 billion by 2050 – Putting fish back on the menu. Food Sec. 7, 261–274 (2015), see [here](#).

¹⁴ Source: FAO Fisheries and Aquaculture Circular No. 1089

¹⁵ Map ASC certified farms, see [here](#)

Use of ASC in Norway for salmon farming

Salmon farming has been associated with a number of environmental impacts, such as fish escapes, negative impact on wild salmon, birds and sea mammals, the use of wild fish as ingredient in feed, introduction of diseases and parasites, use of antibiotics and impact of pollution on water quality and the seabed.

Below, an overview of the areas ASC certification targets for responsible salmon farming can be found below¹⁶:

- **Biodiversity**

ASC certified salmon farms minimise impacts on the local ecosystem in a number of ways, such as the development and implementation of an impact assessment to protect birds, marine mammals and sensitive habitats, protection of the ecological quality of the seabed, ensuring farms are not sited in High Conservation Value Areas (HCVA) and minimising fish escapes to an absolute minimum. All lethal incidents with wildlife must be made publicly available.

- **Feed**

ASC certification requires salmon farms to adhere to strict limits to minimise the use of wild fish as an ingredient for feed. In addition, the standard requires farms to ensure full traceability back to a responsibly managed source, preferably certified, both for wild fish and soy.

- **Pollution**

ASC certified salmon farms are required to measure various water parameters (phosphorus, oxygen levels, etc.) at regular intervals and remain within set limits. Responsible farming can only take place in water bodies that are classified as 'good' or 'very good' (e.g. by the EU Water Framework Directive). Copper release into the water must be minimised and monitored.

- **Diseases**

ASC certified salmon farms are required to adhere to rigorous requirements to minimise disease outbreaks. In doing so, they must also cooperate with other farmers operating in the same area. A Fish Health Management Plan detailing steps for biosecurity management must be developed under supervision of a veterinarian and implemented on the farm. In addition, the farms need to adhere to low levels of parasites (especially sea lice) and can only use certain medicines under very strict conditions. The use of medicine before a disease is diagnosed (prophylactic use), is prohibited. Producers need to manage farms in such a way that salmon survival rate is high. Instances of unexplained increased mortality, as well as sea lice counts are required to be publicly available.

- **Social**

ASC certification imposes strict requirements based on the core principles of the International Labour Organisation (ILO), these include prohibiting the use of child labour or any form of forced labour. All ASC certified farms are safe and equitable working environments where employees earn a decent wage and have regulated working hours. Producers also need to consult (indigenous) communities, inform them about health risks and provide access to vital resources. Similar requirements apply for suppliers of small salmon that are supplied to the ASC certified salmon farm.

¹⁶ Information retrieved from the ASC website, see webpage [here](#).

ASC Theory of Change

ASC certified seafood is raised to meet the highest standards for environmentally and socially responsible practices. ASC traceability controls ensure the provenance of certified farmed seafood.

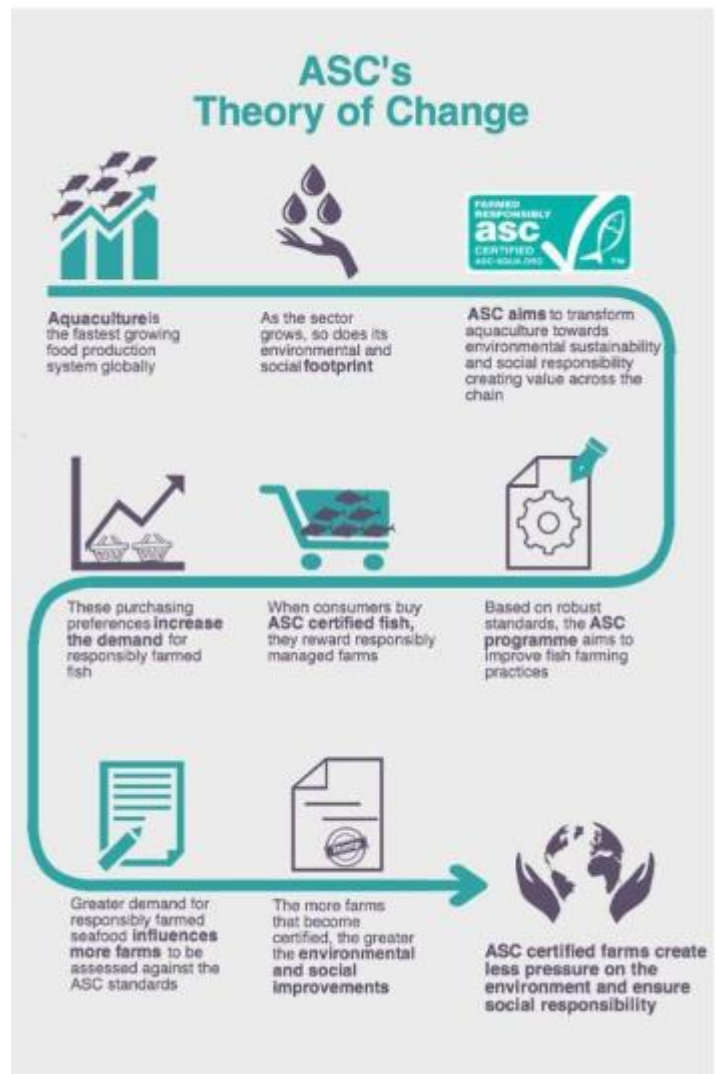
ASC acts in the marketplace to increase the awareness, value, demand, and distribution of ASC certified seafood. As demand grows, there is an incentive for producers to pursue the recognition and reward that ASC certification offers. As more producers achieve certification, more seafood is farmed responsibly.

This process leads to an aquaculture system that produces more fish for more people with the most responsible environmental stewardship and social responsibility.

ASC's work drives transformation towards responsible seafood farming. Our theory of change communicates how effective market mechanisms propel social and environmental improvements in aquaculture. We achieve this by:

- Monitoring, understanding and communicating our impact
- Building and maintaining a rigorous certification programme bound by science-based standards, robust governance systems and effective assurance mechanisms
- Multiplying our impacts through markets and customers, our consumer campaigns and collaborations

This work is supported through clear, ambitious strategic objectives, and the people and partnerships that make our work possible.



Aquaculture – GLOBALG.A.P.

Methodology note

Due to lack of quantitative data, the impact of GLOBALG.A.P. certified salmon farming is prepared in a qualitative manner.

Context and background on GLOBALG.A.P. certification

GLOBALG.A.P. is an internationally recognized standard for farm production which demands greater efficiency in agricultural production across 3 scopes: Crops, Livestock, and Aquaculture. GLOBALG.A.P. relies on independent third-party certification bodies to perform producer audits and issue certificates, and is currently working with more than 2,000 trained inspectors and auditors from around 159 accredited certification bodies.

GLOBALG.A.P. certification covers:

- Food safety and traceability
- Environmental aspects (including biodiversity)
- Workers' health, safety, and welfare
- Animal welfare
- Integrated Crop Management (ICM) and Integrated Pest Control (IPC)
- Quality Management Systems (QMS) and Hazard Analysis and Critical Control Points (HACCP)

GLOBALG.A.P.'s products/standards are the result of intensive research and collaboration with industry experts, producers, and retailers around the globe. They help to improve business performance and reduce the waste of vital resources. Attaining GLOBALG.A.P. certification also requires a general approach to farming that develops and expands on best practices for generations to come. This helps GLOBALG.A.P. work towards the goal of "safe and sustainable agricultural production to benefit farmers, retailers, and consumers throughout the world."

The GLOBALG.A.P. Aquaculture Standard

In operation since 2004, the GLOBALG.A.P. Aquaculture Standard brings the market a complete solution for buyers and suppliers, based on current market demands. It covers full production chain verification of feed, broodstock, seedlings, farming and post-harvest activities up to the point of sale for final consumers, including the key sustainability aspects that animal production for human consumption is required to achieve.

Aspects covered in the standard are those stipulated by the FAO Technical Guidelines on Aquaculture certification. But what sets the GLOBALG.A.P. Aquaculture standard aside from others is its high levels of transparency and reliability, thanks to its inclusion in the robust GLOBALG.A.P. Integrity Program. This pioneering program is the first of its kind in food certification and is designed to ensure consistent delivery and implementation of the standard worldwide. It acts as a feedback mechanism that serves the ongoing improvement of the GLOBALG.A.P. system in all its aspects. Feedback from certified farms also reports that this certification scheme has effectively become a practical guide to their operations, through its detailed criteria written in a clear and accessible manner.

Key benefits and recognition of GLOBALG.A.P. Aquaculture

- **Food safety:** GLOBALG.A.P. Aquaculture is the only certification scheme recognized by the Global Food Safety Initiative (GFSI) for the farming of fish
- **Environment:** GLOBALG.A.P. Aquaculture is recognized by the Global Seafood Sustainability Initiative (GSSI)
- **Animal Health:** Animal health is ensured at all stages by a comprehensive veterinarian animal health plan which covers broodstock, seedlings, farmed fish, and harvesting and slaughter stages. The GLOBALG.A.P. Aquaculture standard covers the OIE (The World Organisation for Animal Health) Aquatic Animal Health Code criteria for farms
- **Animal Welfare:** On top of animal health, GLOBALG.A.P. Aquaculture has been recognized as the only international private standard outside the United Kingdom that covers animal welfare practices at harvest and slaughter. Further animal welfare innovative criteria are applied for all production stages
- **Workers Occupational Health & Safety:** Workers are key to efficient operations; appropriate training is included in the requirements
- **Workers Welfare:** GLOBALG.A.P. Risk Assessment on Social Practices is a compulsory assessment

GLOBALG.A.P. Impact in Norway

GLOBALG.A.P. Aquaculture has a number of requirements to ensure sustainability of the full chain of fish production that goes above and beyond the already robust Norwegian legislative system. These requirements include but are by no means limited to the examples below:

- **Genetic modification** – e.g. requirement that producers shall be able to show traceability to broodstock that are not from a genetically modified origin
- **Environmental impact** – e.g. requirement of a biodiversity-inclusive environmental impact assessment and environmental risk assessment
- **Greenhouse gas emissions** – e.g. biodiversity-inclusive environmental impact assessment to be done to consider emissions and energy from fossil fuels
- **Feed composition and origin** – e.g. documentation shall be presented on the percentage of the supply of fishmeal/fish oil which originates from fisheries managed in accordance with and adhering to the FAO Code of Conduct for Responsible Fisheries, e.g. IFFO, MSC and equivalent others
- **Use of pharmaceuticals** – e.g. a veterinary health plan (VHP) to be established
- **Disease** – e.g. producers must have a documented biosecurity plan, which includes site hygiene, risk of introduction of pathogens and diseases and systems to prevent and disinfect
- **Salmon lice** – e.g. the VHP must have control over parasites
- **Occupational injuries** – e.g. producers must have a written risk assessment to assess hazards to workers' health and safety
- **Societal contributions, taxes, and charges** – e.g. producers must fulfil the GLOBALG.A.P. Risk Assessment on Social Practices (GRASP)

Aquaculture – CO₂ Impact

The Global Salmon Initiative (GSI) published scientific findings on its website with regards to the carbon footprint of farmed salmon in comparison to on-land livestock. The carbon footprint measures the total greenhouse gas emissions caused directly and indirectly by the production of a product. Carbon


footprint is measured in grams of carbon dioxide equivalent (g CO₂eq) per typical serving (40 g) of edible protein of the product. Data are median values.

The conclusion of this study suggested that the farming of salmon is significantly lower in carbon impact compared to other on-land livestock. CO₂e for salmon farming amounted to 0.6 whilst this ranged from 0.88 (chicken) to 5.92 (beef) for the on-land livestock¹⁷.



Key Performance Indicators for SNN

The following Key Performance Indicators (KPIs) will be used to assess SNN's contribution to responsible fish farming:

Category / Subcategory	Indicator	CO ₂ intensity avoided vs. chicken	CO ₂ intensity avoided vs. pork	CO ₂ intensity avoided vs. beef	Contribution to SDG
Eco-efficient and circular economy adapted products, production technologies and processes / Fish Farming	CO ₂ intensity of protein avoided (g CO ₂ eq per typical serving (40g))	0.28	0.7	5.32	

¹⁷ Source: The environmental cost of animal source foods, see [here](#)

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