



2024 Green Bond Impact Report

September 2025

Green Bond Impact Report

In accordance with the Sparebank 1 SMN Green Bond Framework 2024, 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

SMN intends to allocate the net proceeds of the Green Bonds to a portfolio of new and existing loans in the following categories:

- **Green Buildings**
- **Eco-efficient and/or Circular Economy Adapted Products, Production Technologies and Processes**
- **Clean Transportation**
- **Environmentally Sustainable Management of Living Natural Resources and Land Use**
- **Renewable Energy**

Eligibility Criteria to select the Eligible Green Loan Portfolio are set out in the SpareBank 1 SMN Green Bond Framework¹. Such Eligibility Criteria are aligned on a best-efforts basis with the carbon thresholds in the EU Climate Delegated Acts² for relevant sectors.

SpareBank 1 SMN has relied on the support of an external consultant (Multiconsult ASA) to provide the impact calculations and output for the following categories: Green Buildings, Clean Transportation and Renewable Energy.

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

100% Financial Assets

3 Metrics regarding Loans' environmental impacts

Portfolio-based Green Bond reporting is prepared taking into account the ICMA Handbook Harmonized Framework for Impact Reporting (version June 2024)³

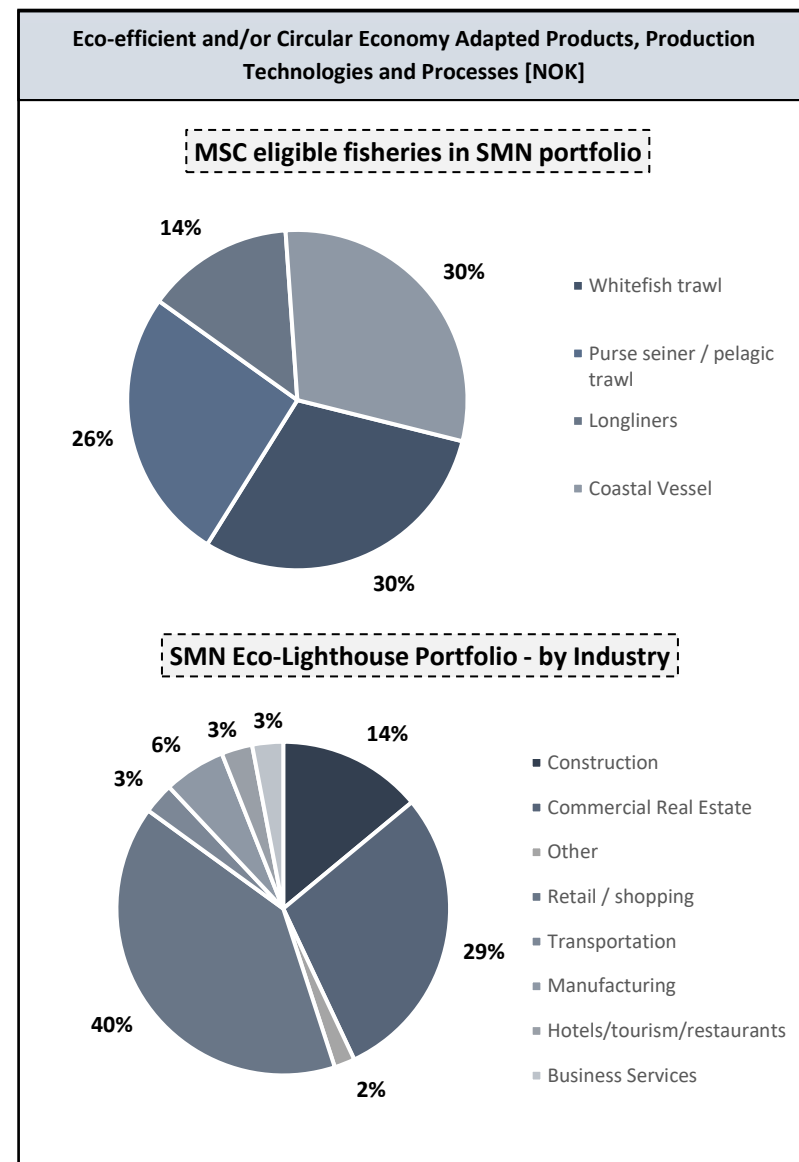
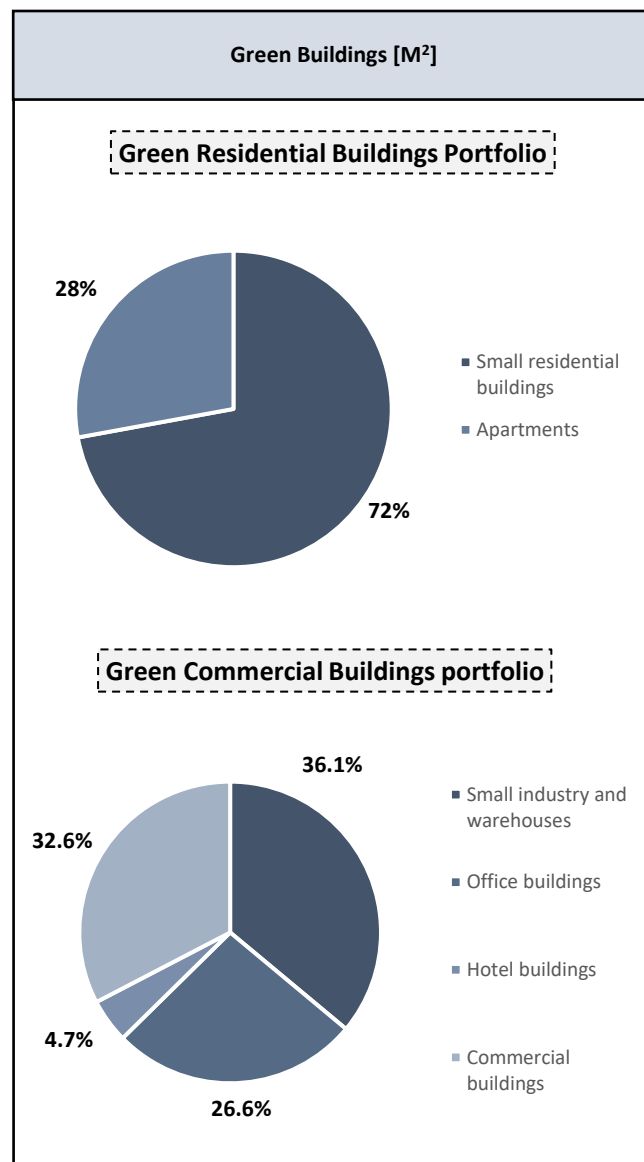
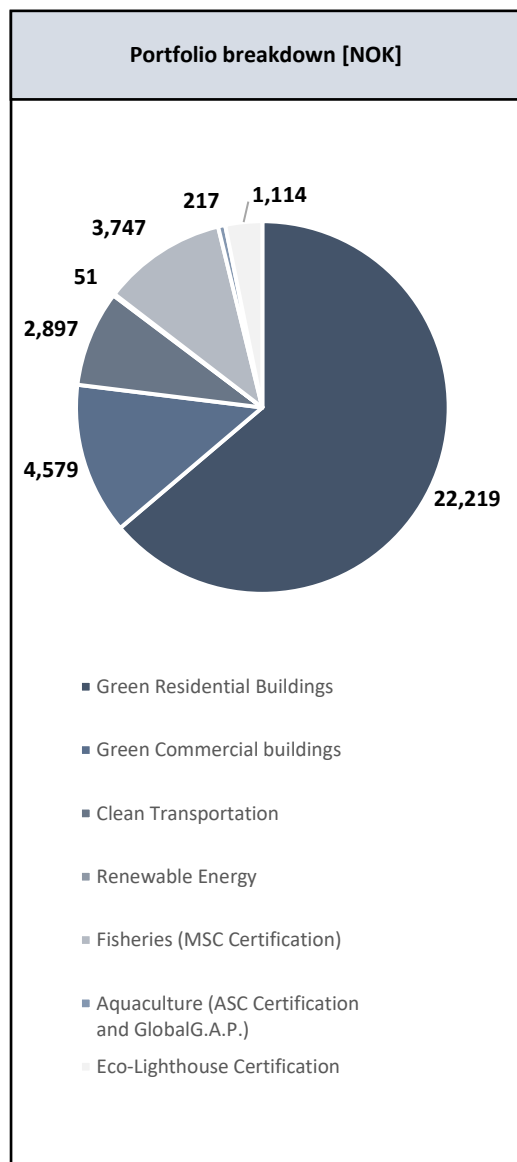
¹ See [here](#) for 2024 SMN Green Bond Framework

² To be found [here](#)

³ To be found [here](#)

Portfolio overview

Portfolio date: 31 December 2024



Impact overview

Portfolio date: 31 December 2024

| Eligible Project Category | Eligible Project Subcategory | Eligible portfolio (NOK m) | Share of Total Financing | Eligibility for Green Bonds | Estimated reduced energy (in GWh/year) | Estimated renewable energy produced (GWh/year) | Direct emissions avoided vs baseline in tonnes of CO ₂ /year (Scope 1) | Indirect emissions avoided vs baseline in tonnes of CO ₂ /year (Scope 2) | Estimated annual reduced emissions (tons of CO ₂ /year) ⁴ | % 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 | 22,219 | 60.41% | 100% | 149 | / | / | / | 17,116 | / | / |
| | Commercial | 4,579 | 12.45% | 100% | 56 | / | / | / | 6,426 | / | / |
| Clean Transportation | / | 2,897 | 7.88% | 100% | / | / | 9,910 | -2,890 | 7,020 | / | / |
| Renewable Energy | / | 51 | 0.14% | 100% | / | 34 | / | / | 4,378 | / | / |
| Environmentally Sustainable Management Of Living Natural Resources and Land Use | Fisheries (MSC Certification) | 3,747 | 10.19% | 100% | / | / | / | / | N/A | +18.7% vs Norway | See appendix |
| | Aquaculture (Global. G.A.P. and ASC Certification) | 2,171 | 5.90% | 100% | / | / | / | / | 0.28 (vs chicken) 0.7 (vs Pork) 5.32 (vs beef) ⁵ | / | See appendix |
| | Eco-Lighthouse | 1,114 | 3.03% | 100% | / | / | / | / | / | / | / |
| Total | | 36,778 | 100% | 100% | 205 | 33.7 | 9,910 | -2,890 | 34,940⁶ | +18.7% vs Norway | |

Portfolio based Green Bond report in accordance with the ICMA Handbook - Harmonized Framework for Impact Reporting (ICMA, June 2024)

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

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 water (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 tones 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 SMN portfolio level due to data availability

⁴ All reduced emissions figures are calculated using European lifetime mix for green buildings and renewable energy or European production mix for clean transportation scope 2 emissions determined in the Multiconsult report found [here](#). Numbers are not scaled by the bank's engagement and SMN is sole lender on all green assets.

⁵ CO₂ intensity avoided for fish farming compared to other protein sources (g CO₂eq per typical serving (40g))

⁶ 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.

The report calculates the different emissions factors relating to three energy mixes. The first is **European (EU27+ UK+ Norway)** and **Norwegian electricity mix** and was determined to equal **136 gCO₂-eq/kWh**. The second is **Norwegian physically delivered electricity** and was determined to equal **15 gCO₂-eq/kWh** and finally **Norwegian residual mix** calculated to be **599 gCO₂-eq/kWh**.

All buildings-related impact figures and emissions factors have been calculated by specialist consultant Multiconsult – see SMN'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] |
|--|-----------------------------|-----------------|--|
| Buildings eligible under the building code criterion and EPC criterion | Apartments | 4,306 | 333,849 |
| | Small residential buildings | 4,587 | 863,176 |
| Total | | 8,893 | 1,197,025 |

The table below indicates the reduction in energy compared to baseline across all the building criteria. The avoided emissions are then calculated in line with the relevant emissions factors:

| | Avoided energy compared to baseline [GWh/year] | Avoided CO ₂ -emissions compared to baseline [ton CO ₂ -eq/year] | | |
|-------------------------------------|--|--|---|-----------------------------|
| | | European (EU27+ UK+ Norway) NS 3720:2018 electricity mix | Norwegian physically delivered electricity mix 2023 | Norwegian residual mix 2023 |
| Eligible buildings in the portfolio | 149 | 17,116 | 2,308 | 73,734 |

Green Commercial Buildings

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

| Category | Area qualifying buildings in portfolio [m2] |
|--------------------------------|---|
| Office buildings | 125,865 |
| Retail/Commercial buildings | 154,522 |
| Hotel and restaurant buildings | 22,387 |
| Industry and small warehouses | 170,701 |
| Total | 473,475 |

The table below indicates the reduction in energy compared to baseline across all the building criteria. The calculated avoided emissions are then calculated in line with the relevant emissions factors:

| Category | Avoided energy compared to baseline [GWh/yr] | Avoided CO2-emissions compared to baseline [ton CO2/yr] | | |
|--|--|---|---|-----------------------------|
| | | European lifetime mix | Norwegian physically delivered el. 2023 | Norwegian residual mix 2023 |
| Eligible Commercial Buildings in Portfolio | 56 | 6,426 | 867 | 27,684 |

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 0.1-2.9 MW (small hydropower plants).

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/kW compared to the baselines.

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

The eligible plants in SpareBank 1 SMN's portfolio is estimated to have the capacity to produce about 42 GWh per year. The table below shows the capacity and production of eligible hydropower plants (HPP), estimated and expected production:

| Category | Capacity [MW] | No. of plants | Estimated production [GWh/year] | Expected production [GWh/year] |
|------------------|---------------|---------------|---------------------------------|--------------------------------|
| Small hydropower | 12.5 | 10 | 42.1 | 33.7 |

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 per energy mix:

| Category | Expected production [GWh/year] | Avoided CO ₂ -emissions compared to baseline [ton CO ₂ /yr] | | |
|---|--------------------------------|---|---|-----------------------------|
| | | European lifetime mix | Norwegian physically delivered el. 2023 | Norwegian residual mix 2023 |
| Eligible hydropower plants in the portfolio | 34 | 4,378 | 303 | 19,972 |

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 clean transportation is assessed based on 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 SMN's Green Bond website for the full methodology report, available [here](#).

Passenger vehicles is the major vehicle category. The number of eligible vehicles as well as the expected yearly mileage can be found below:

| Category | Number of vehicles | Sum distance [km/year] | Sum distance [pkm/year] |
|--------------------|--------------------|------------------------|-------------------------|
| Passenger vehicles | 9,662 | 101.8 million | 173.1 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 per energy mix:

| Category | Avoided CO ₂ emissions compared to baseline (tons CO ₂ /year) | | |
|--|---|---|-----------------------------|
| | European production mix 2021-2023 | Norwegian physically delivered el. 2023 | Norwegian residual mix 2023 |
| Total Direct emissions only (Scope 1) | 9,910 | 9,910 | 9,910 |
| Total Indirect emissions EV's only (Scope 2) | -2,890 | -290 | -11,520 |
| Total Avoided emissions | 7,020 | 9,620 | -1,610 |

The reduction in direct emissions corresponds to 4.1 million litre gasoline saved per year.

iv. Impact of Environmental Certification Schemes

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.

Fisheries – MSC

Context and background

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 37,7% of key stocks are in an overfished state⁷. The proportion of overfished key stocks is unfortunately growing. Overfishing and ecosystem degradation have 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 the global overfishing problem.

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. It is a public education charity registered in the UK and active in 23 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 fisheries⁸. It also developed and operated in improvement program – supporting fisheries to achieve sustainable performance levels, and it 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 verification of sustainability of wild caught seafood. It was recognised as a key indicator by the UN convention on Biological Diversity⁹, 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, and 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.

In September 2019 SpareBank 1 SMN (SMN) issued its first green bond¹⁰. This was the first green bond issued worldwide which used certification against the MSC sustainable fishing standard as an indicator of sustainability for investors. 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

⁷ [The State of World Fisheries and Aquaculture](#)

⁸ <https://www.msc.org/standards-and-certification/fisheries-standard>

⁹ <https://www.msc.org/en-us/media-center/news-media/msc-an-official-biodiversity-indicator-partner-for-a-second-aichi-target>

¹⁰ <https://www.sparebank1.no/content/dam/SB1/bank/smn/om-oss/Barekraft/SpareBank-1-SMN-Green-Bond-Framework.pdf> and <https://sustainabonds.com/sparebank-1-smn-set-to-offer-norwegian-fish-flavoured-benchmark/>

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 91 million metric tons in 2022 according to the FAO. A proportion of Ca. 16% of that global catch is certified against the MSC standards for sustainable fishing.

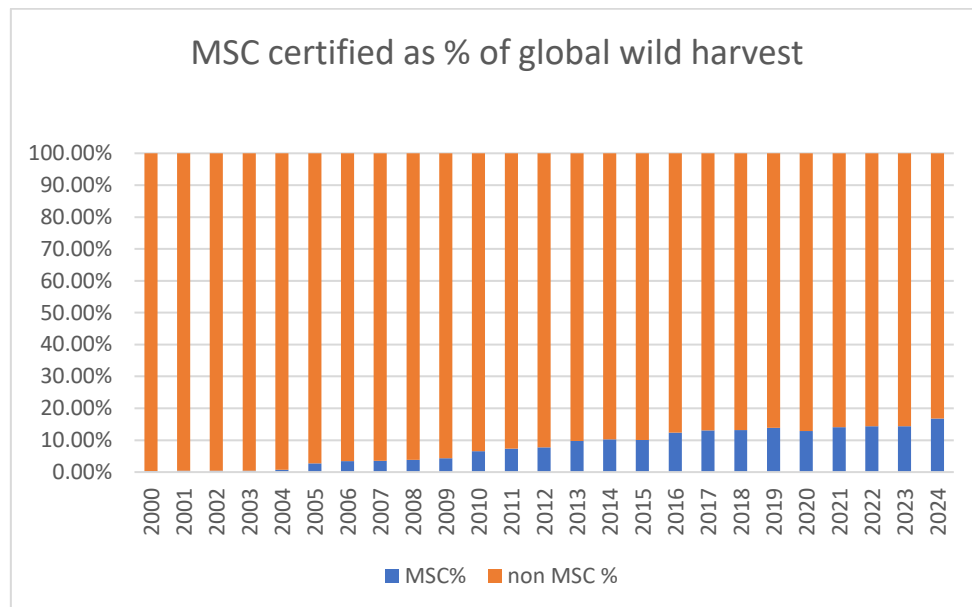


Figure 1: Global catch and estimate % in MSC program as certified 2024

The 16% MSC certified fisheries 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:

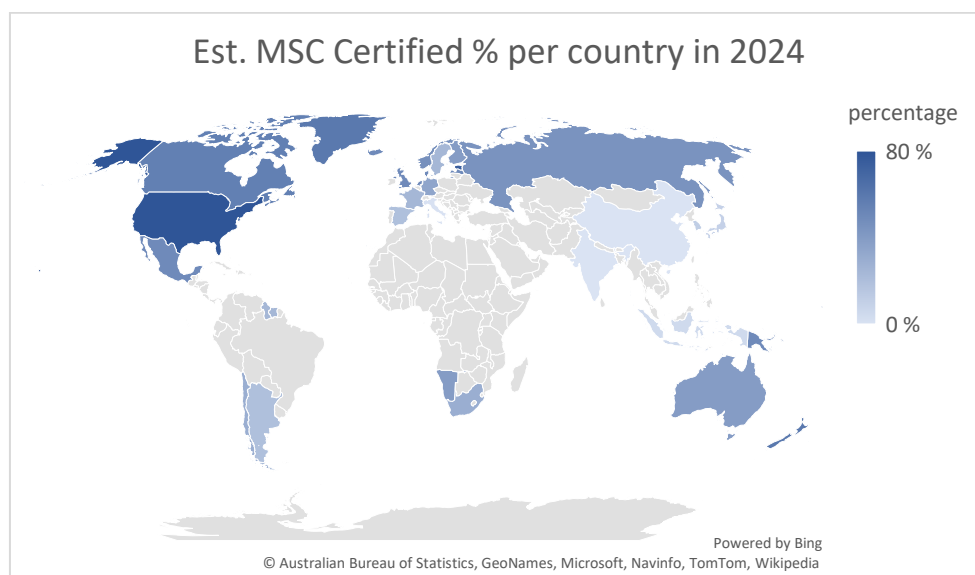


Figure 2: estimated % of catch MSC certified per country, Norway has Ca. 47% of its harvest MSC certified in 2024

Stocks targeted by MSC certified fisheries have *full reproductive capacity*, *impacts of operations on the ecosystems are well understood and minimised*, and the management system for such fisheries is ensuring it stays that way.

In terms of stock status, data from the UN FAO shows a worrying trend over the past decade. An increasing % of fish stocks for which data is available is in an overfished state or depleted. In its latest global update in 2024, the FAO reported that 37,7% of stocks was over-exploited or depleted¹¹.

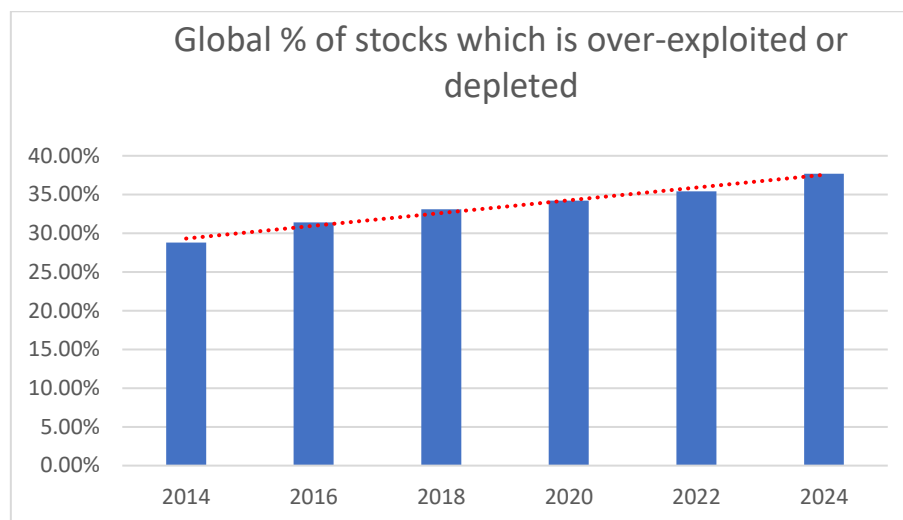


Figure 3: Global % of stocks which is over-exploited or depleted over time, 2022 last FAO data available

Comparison between stocks for which biomass estimates are available in Norway (based on ICES or IMR/PINRO Stock assessment and advice reports 2024, where possible), the world (based on FAO SOFIA 2024) and MSC Certified stocks in Norway as subset from Norway (ICES, IMR/PINRO, Norwegian Directorate of Fisheries 2024, and MSC fisheries datahub 2025), shows that stocks of MSC certified fisheries in Norway are high, compared to the world and to 'all key stocks fished in Norway in 2024'.

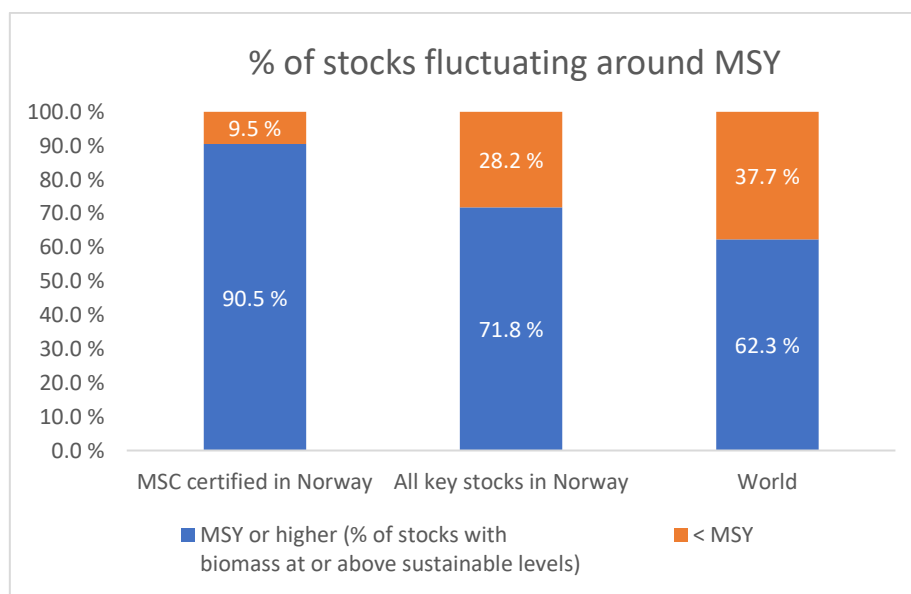


Figure 4: % of stocks with high and low biomass

90,5% of stocks of MSC *certified* fisheries in Norway have sustainable biomass, 71.8% of all key stocks fished were estimated to have sustainable biomass in Norway in 2024. 62,3% of stocks are estimated to 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 are good condition. It is important to note that for some stocks where biomass is currently estimated as

¹¹ Extracted from FAO Sofia publications for consecutive years at FAO webpages. [The State of World Fisheries and Aquaculture \(SOFIA\) - Towards blue transformation \(fao.org\)](https://www.fao.org/publications/default.asp?lang=en&_id=50400230001&_sk=50400230001).

low by science, management has set lower quota, or even closed the fisheries to preserve it for ecosystem needs, or to facilitate 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.

| Indicator | Norway | World ex-Norway | World |
|---|-------------------------|--------------------------|------------|
| ▪ Seafood (tonnes) covered by MSC certification in 2024 | 1 172 367 | 14 152 179 | 15 324 546 |
| ▪ % of seafood volume (wild catch) covered by MSC certification in 2024, out of the total volume of seafood (wild catch) produced | 47,6 % | 16,0 % | 16,8 % |
| ▪ Number of fisheries covered by MSC certification in a particular year out of the total number of fisheries in the MSC program (units of certification). | 69 | 1160 | 1229 |
| Indicator | MSC certified in Norway | All key stocks in Norway | World |
| MSY or higher (% of stocks with biomass at or above sustainable levels) | 90,5 % | 71,8 % | 62,3 % |
| < MSY | 9,5 % | 28,2 % | 37,7 % |

MSC certification signifies high sustainability performance. Table 2 shows the assumed 'certification benefit', based on the likelihood that a randomly picked key commercially exploited stock in Norway was estimated at sustainable level (MSY or higher) in 2024. The % of healthy stocks was significantly higher for stocks covered by MSC certification (90,5%) vs 'all key stocks in Norway' (71,8%) or the 'world' (62,3%). That implies a 18,7% difference between MSC certified Norway and non MSC certified categories in Norway, and a 28,2% difference between MSC certified stocks in Norway and the world.

| MSC certification benefit | |
|---|--------|
| Difference MSC Norway with world | 28,2 % |
| Difference MSC Norway with non MSC Norway | 18,7% |

Impacts with MSC in Norway in 2024:

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 had 42 'open' conditions for improvement in the MSC program at end of March 2025, that is 7 more than in March 2024. Most relate to improving the monitoring of (interaction of fisheries) with ETP species and habitats. Some related to development of, or application of, harvest control rules. Especially for lumpfish, ling and tusk some conditions appear behind target.

Figure 5: MSC Theory of Change: [msc.org/what-we-are-doing/our-approach/](https://www.msc.org/what-we-are-doing/our-approach/)

Challenges in Norway in 2024:

While the overarching MSC ToC works, and the Norwegian fishing industry is in the process of addressing its open conditions, to deliver sustainability improvements, during 2024 the MSC also observed non-addressed challenges in Norway's fisheries (management) performance. Several new challenges emerged as well. Stock assessments for key commercial species harvested in Norway published in the course of 2024, showed that species such as Northsea Herring, Greenland Halibut in Barents and Norwegian seas, Saithe in the Northsea and Cod in the Northeast arctic, are in need of more careful harvesting to either avoid stocks dropping under MSY levels, and/or ensuring recovery to stock to levels where MSY can be produced.

Further, in 2024, the combined individual quotas and catches of mackerel, Atlanto-scandian herring and blue whiting *continued* to exceed ICES advice by an estimated 35%, 33% and 28% 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 have been either suspended or lost their MSC certificates over the past 5 years.

Mackerel stocks are on a downward trend, biomass of AS Herring remains relatively low – despite a very large year class entering the fishery. Blue Whiting stocks are estimated to start contracting in years ahead. If the overfishing relative to scientific advice is not addressed, it can create risks for the ability of these stocks to remain productive in the future. 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.

¹² [Supply chain condemns Norway unilateral quota for mackerel - NAPA \(thefishingdaily.com\)](#) & [Governments urged to agree quota-sharing deal as new data shows Atlanto-Scandian herring and mackerel stocks plummet | Marine Stewardship Council](#)

Comment

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

This section is curated based the ASC website.

Aquaculture – ASC

Context and background on ASC certification

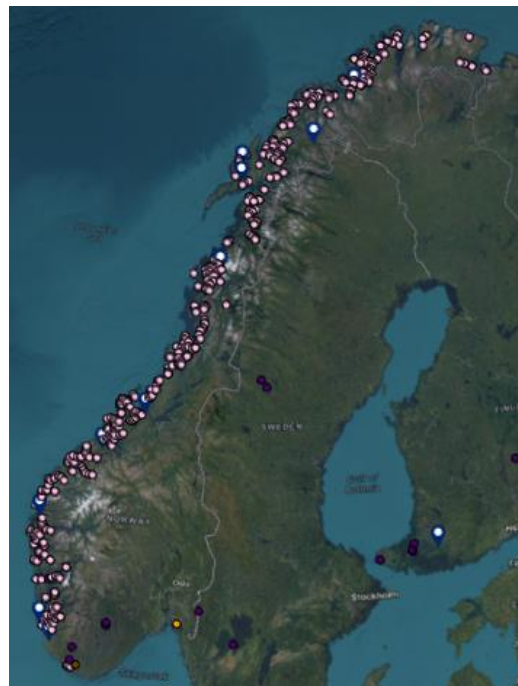
Fish happens to be one of the most efficient converters of feed into high quality food, it has a lower carbon footprint and uses fewer resources than other animal production systems¹³. However, traditional methods of wild capture fishing can't possibly meet the demand. Nearly 90% of global marine fish stocks are fully exploited, overexploited, or depleted¹⁴. 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 running yearly production volume as per July 2025 stood at 636,190 tonnes.¹⁵

Location of ASC certified farms in Norway:

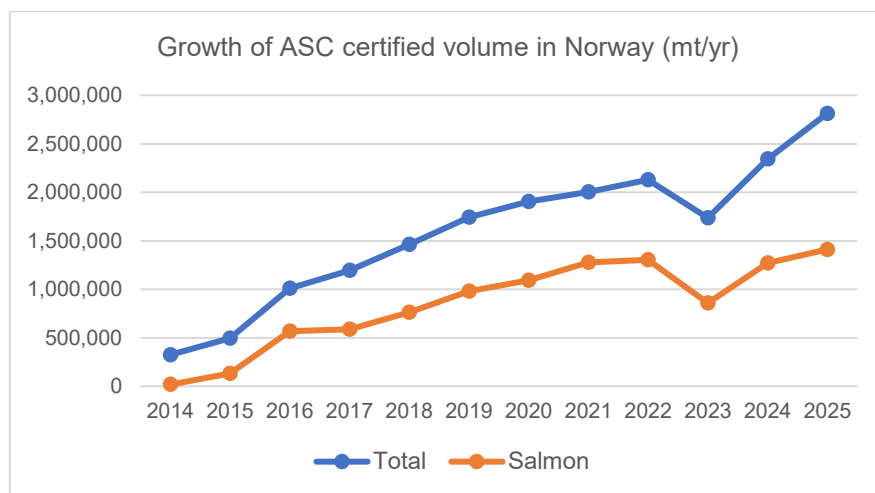


¹³ Source: Béné, C., Barange, M., Subasinghe, R. et al. Feeding 9 billion by 2050 – Putting fish back on the menu. Food Sec. 7, 261–274 (2015), see [here](#)

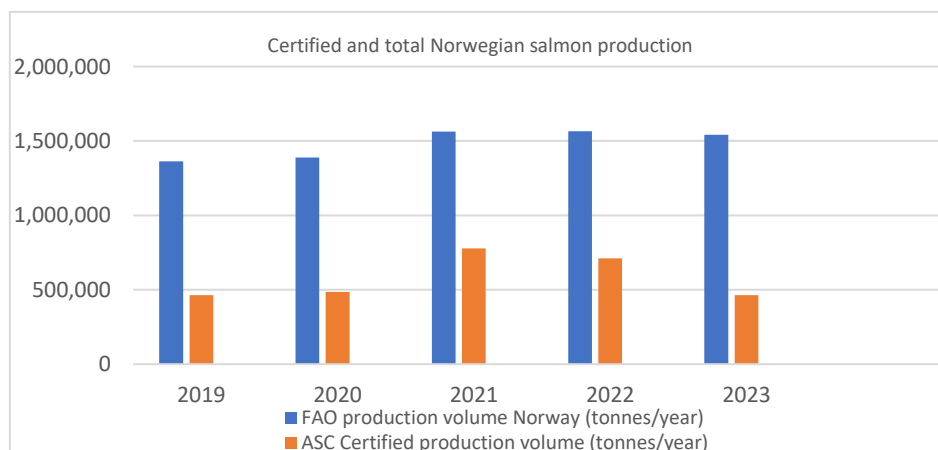
¹⁴ [Global Response to Overfishing and the Role of Geneva – Geneva Environment Network](#)

¹⁵ [Our impact - ASC International](#)

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. This volume fluctuates over time due to: 1) leaving/new farm sites receiving ASC certification, 2) due to adjusted yearly production volumes of certified farm sites or 3) the fact farms do not wish to disclose their certified production volume. The certified production volumes since 2016 can be seen in the chart below.



Certified volume of salmon produced in Norway makes up more than a third of overall production when using the FAO production volume¹⁶ as a base. The percentage of certified volume can be seen in the chart below.



The number of ASC certified salmon farms in Norway amounted to 385. Certified farms in Norway can be found on ASC website¹⁷ and the number of certified farms over time can be seen in the chart below.

¹⁶ Food and Agriculture Organization of the United Nations found [here](#)

¹⁷ 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.

An overview of the areas ASC certification targets for responsible salmon farming can be found below¹⁸:

- **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

¹⁸ Information retrieved from the ASC website, see webpage [here](#).

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

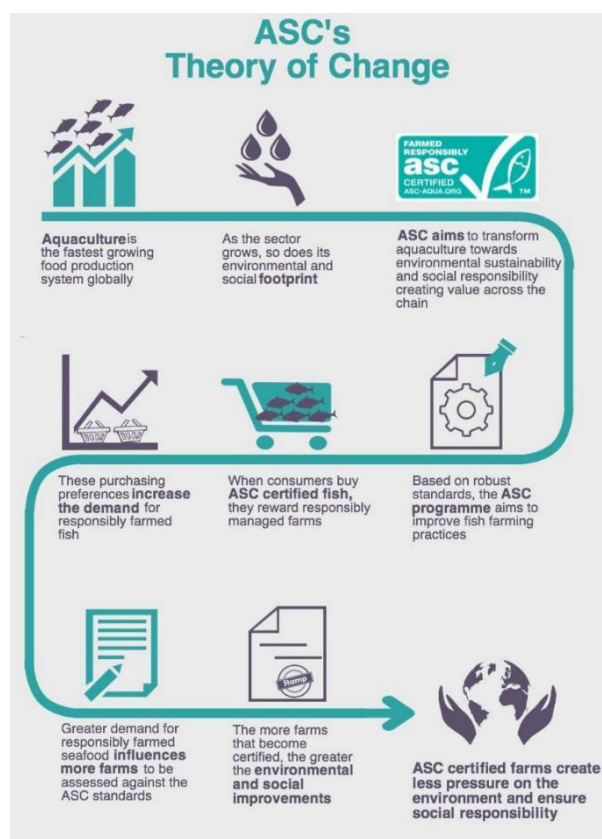
ASC certification imposes strict requirements based on the core principles of the International Labour Organisation (ILO), these include prohibiting the use of child labour or any form of forced labour. All ASC certified farms are safe and equitable working environments where employees earn a decent 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.

ASC Theory of Change¹⁹

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.



¹⁹ [Measuring our impact - ASC International](#)

Methodology note

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

Aquaculture – GLOBALG.A.P.

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 over 190+ accredited certification bodies.

GLOBALG.A.P. certification covers:²⁰

- 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.

²⁰ [Integrated Farm Assurance for aquaculture](#)

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 livestock²¹.



Key Performance Indicators for SMN

The following Key Performance Indicators (KPIs) will be used to assess SMN'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 / Fisheries | CO ₂ intensity of protein avoided (g CO ₂ e per typical serving (40g)) | 0.28 | 0.7 | 5.32 |  |

²¹ Source: <https://globalsalmoninitiative.org/en/our-progress/sustainability-report/sustainable-food-systems/#carbon-footprint> ; The environmental cost of animal source foods, see [here](#)

Methodology note

Due to lack of quantitative data, the impact of Eco-Lighthouse certification is prepared in a qualitative manner.

Eco-Lighthouse

Context and background on Eco-Lighthouse certification²²

The Eco-Lighthouse (ELH) certification scheme is Norway's most widely used environmental management system, with more than 10,000 valid certificates granted to small, medium and large organisations. Through easily implemented, concrete, relevant and profitable measures, enterprises can improve their environmental performance, control their environmental impact and prove their dedication to corporate responsibility.

The Eco-Lighthouse certification scheme integrates environmental management of both internal and external environmental aspects, into the legal framework of Norwegian Regulations relating to Systematic Health, Environmental and Safety Activities in Enterprises.

When the enterprise is ready to be certified, the certifier and the enterprise decide a date for certification. The certifier is given access to all relevant documents pertaining to the enterprise through the Eco-Lighthouse web portal, in order to prepare for certification.

The certification meeting involves the certifier checking whether the industry criteria are fulfilled, checking the annual climate and environmental report, on-site inspection of the facilities and interviews with key staff. After the meeting, the certifier sums up his or her findings in the environmental statement. In case of non-compliance with general or specific industry criteria, the certifier notifies the enterprise of what needs to be done to rectify the situation and sets a deadline for doing so. When all criteria are met, the enterprise is approved.

General and specific industry criteria are developed by ELH in collaboration with relevant government bodies, scientists, interest organisations, customers and experienced consultants and certifiers to identify and address the relevant environmental aspects and effective measures of the industry in question and are subject to periodic reviews.

EU recognition

The Eco-Lighthouse Foundation is the first national certification scheme in Europe to be recognised by the European Commission. The recognition verifies that the scheme holds the standard and quality on a par with international eco-labelling schemes (EMAS and ISO 14001). After a lengthy assessment, the decision to recognise the Eco-Lighthouse Foundation pursuant to Article 45 of Regulation (EC) No 1221/2009 was adopted by the European Commission on 6 December 2017.

It is important to note that the assessment was conducted based on a comparison of similarities between the Eco-Lighthouse Foundation scheme and EMAS and on how the Eco-Lighthouse Foundation scheme could correspond to EMAS if desired. This follows from the intention in Article 45 of Regulation (EC) no. 1221/2009. The Eco-Lighthouse Foundation scheme was compared with EMAS and found satisfactory.

Reasons for businesses to become Eco-Lighthouse certified

1. Valid documentation – a seal of quality

The certification can be used as approved documentation in public procurement and is valid proof of environmental management in the EU/EEA.

All Environmental Lighthouse businesses are recertified every three years, through an independent third-party audit. The certification proves that the business works systematically with environmental management.

2. Gain competitive advantage

Environmental requirements are becoming increasingly stringent in public procurement. With Environmental Lighthouse certification, it becomes much easier to document a company's environmental work, and the company qualifies to participate in

²² Information retrieved from the Eco-Lighthouse website, see [here](#)

more tenders. Companies that can show valid documentation of this work can be prioritized in the selection of suppliers and partners.

3. Achieve real environmental impact

In the certification process, the company receives smart tools to work concretely with sustainability in areas such as the working environment, waste management, energy use, purchasing and transport. The company is helped to work holistically, systematically and long-term with measures that will improve the company's environmental performance, reduce greenhouse gas emissions - and contribute to a green future.

4. Strengthen your reputation and brand

Environmental Lighthouse certification gives the company a seal of quality that builds trust and strengthens competitiveness. The certificate is recognized by customers, business leaders and authorities alike, and shows that the company is taking concrete steps towards a sustainable transition. At the same time, the certification creates increased environmental awareness, increased pride and increased commitment among employees.

5. Cut costs and increase profitability

Sustainability pays off, not only for the environment, but also on the bottom line.

With a smart environmental management tool, the business gets help to review all its routines. This will help the business achieve more profitable operations - and can save costs on waste reduction, lower energy consumption and smart transportation solutions.

6. Good overview and simplification of work

Even though the requirements for businesses are constantly tightening, sustainability work doesn't have to be complicated. Miljøfyrtårn's digital sustainability tool, LUMA, is clear and user-friendly, and provides businesses with smart guidance in their sustainability work and certification process.

7. Concrete goals and measures

The administrative work for a certification is done in LUMA, Miljøfyrtårn's digital sustainability tool. In LUMA, specific goals that are important for the business are selected and measures that contribute to real improvements. The business can easily follow developments, implement new measures and set new goals.

8. Reduce sick leave

In the certification process, the company will receive specific advice and help to put good HSE and working environment routines in place. This can help reduce sick leave.

9. Demonstrate leadership and accountability

Climate change and environmental challenges require action now. With Environmental Lighthouse certification, businesses begin a transformation and contribute to a sustainable future - for both the business and future generations. Businesses that are certified demonstrate clear leadership and responsibility.

Use of Eco-Lighthouse in Norway

Eco-Lighthouse certification can have several benefits for enterprises enrolled in this scheme. Some of these benefits are listed below²³:

- ✓ **Become sustainable:** Eco-Lighthouse certification gives smart tools for working specifically with sustainability in areas such as the working environment, waste management, energy use, purchasing and transport. Certified companies get help to work holistically, systematically and long-term with measures that will improve their environmental performance, reduce greenhouse gas emissions - and contribute to a green future. The Eco-Lighthouse certification also sets conditions to contribute to achieving several of the UN's Sustainable Development Goals
 - **71.4%** of Eco-Lighthouse-certified businesses experience large-scale environmental improvements
- ✓ **Gain competitive advantage**
 - **58.5%** of environmental lighthouse-certified businesses experience greatly strengthened competitiveness
- ✓ **Strengthen the brand**

²³ Based on Miljøfyrtårn's customer survey 2023 among private companies. Results to be found [here](#)

- 67.5% of Eco-Lighthouse-certified businesses experience a great deal of reputation improvement
- ✓ **Cut costs**
 - 49.3% of Eco-Lighthouse-certified businesses experience greatly reduced costs
- ✓ **Set goals and create results:** Eco-Lighthouse's [digital tool for environmental follow-up](#) gives companies a good graphical overview, statistics and reports that show the effect the environmental work has had. Clients can easily follow the path of development, implement measures and set new environmental goals to improve their environmental performance. An example of the output & metrics used may be found [here](#)
 - 64.2% of Eco-Lighthouse-certified businesses experience a large contribution to green conversion
- ✓ **Reduced sick leave**
- ✓ **Influence suppliers and partners**
 - 55.6% of Eco-Lighthouse-certified businesses feel that they have largely influenced suppliers and partners to reduce their environmental and climate impact

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