°CICERO Shades of Green

Mowi ASA
Green Bond Second Opinion

January 20, 2020

Mowi ASA ("Mowi") is a Norwegian salmon fish farming corporate headquartered in Bergen and the world's largest salmon producer. Mowi anticipates allocating 60% of the use of proceeds to Sustainable Aquaculture and the remainder mostly to Water and Wastewater management. The carbon footprint of farmed salmon is relatively low. A recent study finds that it has a lower climate footprint than pork and beef, while higher than chicken. Eighty to one hundred percent of the proceeds will go to financing for new projects, and will be allocated to both investments but also expenditures such as sustainable feed.

Aquaculture entails risks of several forms of local environmental degradation, but the most serious risks are mitigated through Mowi's use of certifications. This framework partly relies on certification by the Aquaculture Stewardship Council (ASC), which is regarded as the strictest voluntary certification scheme on environmental criteria which are stricter than regulation. The main source of GHG emissions from aquaculture comes from the feedstock. Where relevant, this framework requires 100% deforestation-free soy certified by a scheme that does not allow physical mixing of certified and non-certified soy in the supply chain.

Fish escapes pose a serious threat to wild salmon stocks, as the farmed fish modify the gene pool and outcompete local species. The ASC certification sets a stricter limit on the number of escaped fish, but has been criticized for not being strict enough. For 2019, Mowi has – at the time of writing – registered 12 escape incidents involving 53 000 fish, across Norway, Scotland, and Chile. The company aims to have zero fish escapes in each country every year. If certification is lost due to fish escapes or withdrawn for other reasons, investments in such farms will be replaced by other eligible investments.

Mowi has set Science-Based Targets for GHG emissions reductions and has developed a low-carbon transition pathway to support these targets. Mowi commits to report on several indicators, largely on a project-by-project level, but does not obtain third party verification for its impact reporting**.**

Based on an assessment of the framework's alignment with the Green Bond Principles, the project categories and Mowi's governance, Mowi's green bond framework receives the overall **CICERO Medium Green** shading and a governance score of **Excellent**.

SHADES OF GREEN

Based on our review, we rate the Mowi's green bond framework **CICERO Medium Green.**

Included in the overall shading is an assessment of the governance structure of the green bond framework. CICERO Shades of Green finds the governance procedures in Mowi's framework to be **Excellent**.

GREEN BOND PRINCIPLES

Based on this review, this Framework is found in alignment with the principles.

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Contents

1 Terms and methodology

This note provides CICERO Shades of Green's (CICERO Green) second opinion of the client's framework dated January 2020**.** This second opinion remains relevant to all green bonds and/or loans issued under this framework for the duration of three years from publication of this second opinion, as long as the framework remains unchanged. Any amendments or updates to the framework require a revised second opinion. CICERO Green encourages the client to make this second opinion publicly available. If any part of the second opinion is quoted, the full report must be made available.

The second opinion is based on a review of the framework and documentation of the client's policies and processes, as well as information gathered during meetings, teleconferences and email correspondence.

Expressing concerns with 'shades of green'

CICERO Green second opinions are graded dark green, medium green or light green, reflecting a broad, qualitative review of the climate and environmental risks and ambitions. The shading methodology aims to provide transparency to investors that seek to understand and act upon potential exposure to climate risks and impacts. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. The shades are intended to communicate the following:

CICERO Shades of Green	Examples
Dark green is allocated to projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Ideally, exposure to transitional and physical climate risk is considered or mitigated.	Wind energy projects with a strong governance structure that integrates environmental concerns
Medium green is allocated to projects and solutions that represent steps towards the long-term vision, but are not quite there yet. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Physical and transition climate risks might be considered.	Bridging technologies such as plug-in hybrid buses
Light green is allocated to projects and solutions that are climate friendly but do not represent or contribute to the long-term vision. These represent necessary and potentially significant short-term GHG emission reductions, but need to be managed to avoid extension of equipment lifetime that can lock-in fossil fuel elements. Projects may be exposed to the physical and transitional climate risk without appropriate strategies in place to protect them.	Efficiency investments for fossil fuel technologies where clean alternatives are not available
Brown is allocated to projects and solutions that are in opposition to the long-term vision of a low carbon and climate resilient future.	New infrastructure for coal

Sound governance and transparency processes facilitate delivery of the client's climate and environmental ambitions laid out in the framework. Hence, the governance aspects are carefully considered and reflected in the overall shading of the green bond framework. CICERO Green considers four factors in its review of the client's governance processes: 1) the policies and goals of relevance to the green bond framework; 2) the selection process used to identify and approve eligible projects under the framework, 3) the management of proceeds and 4) the reporting on the projects to investors. Based on these factors, we assign an overall governance grade: Fair, Good or Excellent.

2 Brief description of Mowi's green bond framework and related policies

Mowi ASA ("Mowi") is a Norwegian salmon fish farming corporate headquartered in Bergen and the largest salmon producer globally in terms of revenue and volume of produced salmon. In 2018, Mowi has produced 375,000 tonnes of gutted weight equivalents of salmon, which is equivalent to approximately 6.4 million meals a day. Mowi delivers salmon to about 70 countries and has local representations in 25 countries in Europe, Asia, North- and South America.

Mowi's three business areas are feed production in Norway and Scotland, farming and primary processing of Atlantic salmon in Norway, Scotland, Chile, Canada, Ireland and Faroes, and sales and marketing (including value added processing) in Europe, US and Asia. The geographical distribution of sales is 67% to Europe, 22% to the Americas, 9% to Asia, and 2% to the rest of the world. Mowi is a vertically integrated company, thus controlling the value chain from feed production through to sales.

Environmental Strategies and Policies

Mowi has recently set Science-Based Targets (SBT) for GHG emissions reductions and has developed a low-carbon transition pathway to support these targets. It commits to reduce absolute scope 1 and 2 GHG emissions 35% by 2030 and 72% by 2050 relative to 2016. It also commits to reduce absolute scope 3 GHG emissions 35% by 2030 and 72% by 2050 relative to 2018.

In 2018, Mowi's total GHG emissions (Scope 1 and 2) decreased 1,7% from 215,281 tonne CO_2e in 2017 to 211,445 tonne CO_2e in 2018. Mowi's main sources of energy are electricity (41%), diesel (25%), fuel oil (14%), natural gas (13%), propane (3%), heating oil (3%) and gasoline (1%). The fossil fuels are used mainly in the farming business areas at sea sites to power generators that makes the feeding systems work. In Norway, more than 80% of sea sites have phased out diesel generators and are connected to the grid. In the other farming countries, Mowi aims to replace diesel generators with hybrid solutions that can reduce significantly the use of diesel. These investment will however not be eligible for Green Bond financing, which excludes all investments in equipment using fossil fuel.

In 2018, Mowi has calculated and audited its Scope 3 emissions in connection to sourcing feed raw materials to its feed business area. The estimates indicate that sourcing and transportation of feed raw materials resulted in 742,392 tonnes of CO_2e or 2.25 kg CO_2e/kg feed produced. While emission intensity has decreased for feed production, emission intensity in the farming business area has increased compared to 2016 from 215 to 240kg CO_2e/tonne biomass produced in seawater and in the sales and marketing business area from 190 to 375 kg CO_2e/tonne of end product sold. It plans to audit the scope 3 emissions from its other activities within the next 2 years.

Mowi has a target of achieving 100% certification from the Aquaculture Stewardship Council (ASC) by 2025. Currently 42% (99 sites) of the group's sites are certified according to ASC. It reports that the main obstacle to achieving 100% certification is currently sea lice pressure. Mowi also aims at implementing circularity in their waste management with a goal of zero-waste into landfills at their processing plants by 2025. By 2025, Mowi intends 100% of plastic packaging to be reusable, recyclable or compostable and at least 25% of plastic packaging to come from recycled plastic content. In addition, by 2023, 100% of farming plastic equipment will be reused or

recycled. The company aims to have zero fish escapes in each country every year. For 2019, it has – at the time of writing – registered 12 escape incidents involving 53 000 fish, across Norway, Scotland, and Chile.

Mowi has developed a sustainable feed sourcing policy to ensure full traceability of feed raw materials, a low feed conversion ratio, and avoid agricultural products produced on land that has been deforested. Their target is to achieve 100% compliance with this policy. In 2018, the compliance rate was 83% (in terms of tonnes of feed produced). The soy used for its own feed production will from 2020 be 100% certified by ProTerra or an equivalent scheme to safeguard against deforestation (see further details in Background section).

The issuer reports in accordance with the Global Reporting Initiative (GRI), commits to the principles of the United Nation's Global Compact and reports to the CDP every year. Mowi is part of several initiatives, such as the Global Salmon Initiative, the Keystone Dialogues (including the "Seafood Business for Ocean Stewardship" (SeaBOS) initiative that aims at transparency and traceability through operations and development of ocean plastic reduction strategies), and the Global Sustainable Seafood Initiative.

Mowi recognizes climate risks as material to its business. Mowi manages climate-related risks and opportunities within Global Technical Teams comprised of representatives from each business unit and plans to implement TCFD reporting in the annual report within the next two years. The prioritization of risks and opportunities is based on likelihood and total impact of the potential risk. According to the issuer, current regulations and emerging regulations are assessed, in particular carbon taxation, emissions labeling and farming restrictions. In addition, reputational risks through stigmatization of the sector is identified as a more likely than unlikely transition risk in the long-term. Impacts on feed raw materials, new service suppliers using, e.g., electric boats, as well as energy efficiency innovations are considered. Acute physical risks, such as extreme weather events through cyclones and floods are always included in Mowi's risk assessments. Chronic physical risks such as impacts on operations, suppliers and final product delivery oceanic circulation and climate variability patterns are included in the standard risk assessments according to Mowi. Physical and transition risks are estimated regarding their potential likelihood, time horizons, magnitude, financial impacts and management.

Use of proceeds

An amount equal to the net proceeds of the Green Bonds will finance or refinance, in whole or in part, investments undertaken by Mowi or its subsidiaries in accordance with the framework's eligibility criteria. Mowi includes the following project categories in the green bond framework: Environmentally sustainable aquaculture; Energy efficiency; Water and wastewater management; Waste management; Eco-efficient and/or circular economy adapted products, production technologies and processes. Currently, Mowi anticipates allocating 60% of the use of proceeds to Sustainable Aquaculture and the remainder mostly to Water and Wastewater management. Zero to 20% of the proceeds will go to refinancing.

Under this framework, Mowi will not finance projects with the purpose of fossil energy production, nuclear energy generation, weapons and defense, potentially environmentally harmful resource extraction (such as rare-earth elements or fossil fuels), gambling or tobacco. Moreover, investments and expenditures for fossil fuel machinery and/or equipment is not eligible for Green Bond financing.

Selection:

The selection process is a key governance factor to consider in CICERO Green's assessment. CICERO Green typically looks at how climate and environmental considerations are considered when evaluating whether projects can qualify for green finance funding. The broader the project categories, the more importance CICERO Green places on the governance process.

In a first step, potential green projects are evaluated for compliance with the green bond project categories and environmental benefits by sustainability experts and representatives within Mowi. In a second step, the potential projects are presented to a newly established Green Bond Committee ("GBC"), which will be responsible for approving the projects eligibility. Decisions on allocation of net proceeds to eligibility projects will be made in consensus and the decisions will be documented and filed. Mowi informed us that Life-Cycle Assessments (LCAs) are typically conducted for fee-related projects and that project evaluation is done with regards to the potential GHG emission reduction incl. the assessment of lock-in and rebound risks.

The GBC will be comprised of the Chief Sustainability Officer, Chief Financial Officer, Head of Treasury, Chief Operating Officer for the relevant business area. The GBC will convene every six months. If a green project is sold, or for other reasons loses its eligibility, funds will then follow the procedure under Management of Proceeds until reallocated to other eligible Green Projects. According to the issuer, Mowi uses its standard engagement process with local populations to determine if and how to move ahead with a project and has no on-top screening process for controversial projects related to use of proceeds.

Management of proceeds

CICERO Green finds the management of proceeds of Mowi to be in accordance with the Green Bond Principles. Mowi will use a green register to track the allocation of net proceeds from green bonds to green projects in order to only support the financing of green projects or to repay green bonds. Net proceeds will be allocated to portfolio disbursements.

Net proceeds can finance both existing and new green projects financed by Mowi or its subsidiaries. New green projects are defined as projects taken into operation less than 12 months prior to the approval by Mowi's Green Bond Committee. Refinancing is defined as financing for green projects taken into operation more than 12 months prior to the Green Bond Committee's approval.

Unallocated Green Bond net proceeds may temporarily be placed in the liquidity reserve and managed accordingly by Mowi. Temporary holdings will not be placed in entities with a business plan focused on fossil energy production, nuclear energy generation, weapons and defense, potentially environmentally harmful resource extraction (such as rare-earth elements or fossil fuels), gambling or tobacco.

The management of proceeds will be reviewed by an external auditor appointed by Mowi.

Reporting

Transparency, reporting, and verification of impacts are key to enable investors to follow the implementation of green finance programs. Procedures for reporting and disclosure of green finance investments are also vital to build confidence that green finance is contributing towards a sustainable and climate-friendly future, both among investors and in society.

Mowi will annually and until maturity of the Green Bonds issued, publish a report describing the allocation of proceeds and the environmental impact of the Green Projects. The GBC is responsible for compiling the reporting and the first report is expected to be published around year-end 2020.

The allocation report will include a summary of green bond developments; the outstanding amount of green bonds issued; the balance of the special account (including any temporary investments and green bond repayments) and the available headroom in the value of the green projects (if any); the distribution between new financing and refinancing; the total aggregated proportion of green bond net proceeds used per green projects category.

The impact reporting will include environmental impact metrics on a project-by-project level where possible, but to some extent aggregated where a large number of smaller projects is financed.

An independent external auditor appointed by Mowi will provide, on an annual basis, limited assurance that an amount equal to the green bond net proceeds has been allocated to green projects. The impact assessment is provided with the reservation that not all related data can be covered and that calculations will be on a best intention basis. Mowi has put forward a list of impact metrics to be reported for each project category.

No external review will be obtained for Mowi's impact reporting. The Green Bond Framework, the second party opinion, the limited assurance and the annual Green Bond Report will all be publicly available on Mowi's website.

3 Assessment of Mowi's green bond framework and policies

The framework and procedures for Mowi's green bond investments are assessed and their strengths and weaknesses are discussed in this section. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon projects; weaknesses are typically areas that are unclear or too general. Pitfalls are also raised in this section to note areas where Mowis should be aware of potential macro-level impacts of investment projects.

Overall shading

Based on the project category shadings detailed below, and consideration of environmental ambitions and governance structure reflected in Mowi's green bond framework, we rate the framework **CICERO Medium Green.**

Eligible projects under the Mowi's green bond framework

At the basic level, the selection of eligible project categories is the primary mechanism to ensure that projects deliver environmental benefits. Through selection of project categories with clear environmental benefits, green bonds aim to provide investors with certainty that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP) state that the "overall environmental profile" of a project should be assessed and that the selection process should be "well defined".

Category	Eligible project types	Green Shading and some concerns
Environmentally sustainable aquaculture	The financing or refinancing of investments and expenditures related to construction, development, maintenance, acquisition and improvement of sustainable feed production facilities, fish farms and processing facilities as well as research and development and environmental management. **Sustainable feed** Investments and expenditures related to sourcing and production of sustainable feed in compliance with Mowi's policy on sustainable salmon feed and including requirement on 100% deforestation-free soy (ensured by ProTerra certification or by a certification scheme with equivalent requirements, ensuring segregation of certified and non-certified soy).	**Medium Green** ✓ Farmed salmon is a protein source with low carbon footprint compared to red meat. However, there is a climate risk regarding aquaculture in that soy used for feed may drive up demand for deforestation. ✓ The criterion for ProTerra or equivalent certification ensures that the soy is not grown on recently deforested areas. ✓ A problem with all certification schemes is that major soy producers currently only certify a small share of their production,

Sustainable fish farms
Investments and expenditures related to fish farms certified, or in preparation to become certified, by the Aquaculture Stewardship Council (ASC), using feed in accordance with above criteria.

Sustainable processing
Investments and expenditures related to processing facilities that are certified, or expected to become certified, using CoC (Chain of Custody) to ensure traceability of ASC products.

Research and development
Costs related to R&D aimed at improving the environmental performance of feed, fish farms and processing.

Environmental management and fish welfare
- Investments to protect, restore and enhance ecosystems and biodiversity, such as escape prevention (e.g sensors technology) and the reduction of microplastics.
- Investments in fish welfare, including sea lice management and the prevention and reduction of medicine and antibiotic use.

while the rest may contribute to deforestation. Mowi has informed us that it is in a dialogue with its soy suppliers to encourage actions to ensure that their farmers preserve all forest on their land.

✓ There are other serious concerns about the environmental impacts of aquaculture, including escapes, effluent and waste water discharge, antibiotic use, chemicals use, overexploitation of wild fish stocks for feed, and sea lice.

✓ The ASC has safeguards on these issues by setting stricter limits than national regulation, but has been criticized for tolerating 300 escaped fish per production cycle and for a lenient limit on hydrogen peroxide.

✓ Mowi has informed us, that to be eligible under Research and Development, improving environmental performance must be the primary aim of the R&D activity. Environmental performance refers to environmental topics considered material for their business and which are identified in sustainability strategy and annual report.

✓ Investment under Environmental management and fish welfare will use new technologies that are not business-as-usual, Mowi has informed us.

✓ Sustainable processing investments includes new factories and factories buildings. While no fossil fuel equipment is eligible, Mowi should take into account potentially substantial construction emissions, energy efficiency, public transport access and climate resilience.

Energy Efficiency	The financing or refinancing of solutions that significantly reduces the energy consumption of the underlying asset, technology, system or production process. • Energy saving initiatives contributing to a reduction in the energy consumption of the farming or production plant by at least 20%, such as smart control systems, energy efficiency lighting, sensors for lighting solutions, heat exchangers, solar boiler systems etc. • Direct costs (e.g. material, installation and labour) for implementing energy saving initiatives, such as upgrading equipment, energy efficient cooling and drying systems or costs for enabling renewable energy sources related to the facilities. Mowi will ensure all of the following: o High estimated energy savings in the targeted area (minimum 20%). o Minimize long term negative climate impact and potential rebound effects. o Minimal negative climate impact from the technology used.	**Medium Green** • Mowi has informed us that the energy saving initiatives are planned so that their total contribution leads to achievement of its target to reduce scope 1 and 2 GHG emissions by 35% by 2030 relative to 2016. • There will be no direct investments in fossil fuel equipment.
Water and wastewater management	The financing or refinancing of the establishment, acquisition, capacity expansion and upgrade of sustainable wastewater treatment solutions, the associated infrastructure and water efficiency measures, including: **Wastewater treatment** Improving wastewater treatment leading to reduced volumes of wastewater or improved water quality, such as technical solutions leading to more concentrate wastewater to facilitate its disposal or upcycling. **Water-use efficiency** Improving freshwater use efficiency through technological improvements at the farming units, feed and processing plants (minimum 20% efficiency improvement).	**Medium Green** ✓ Discharge of effluents and waste water to the marine environments can cause toxic algae blooms and negative effects on wild fish. Investments under this category can contribute to reducing such problems. ✓ In addition, they may contribute to increasing resource efficiency.
Waste Management	The financing or refinancing of the establishment, acquisition, expansion or upgrades of solutions contributing to the management, reduction and reuse of waste.	**Medium Green**

	• Initiatives contributing to an efficient management of waste and reduced need of virgin raw materials. This can include, e.g., virgin plastic and the collection and treatment of particulate organic matter to be re-used for other productive purposes such as fuel for biogas and soil fertilizer.	✓ There will be no direct investment in waste to energy
Eco-efficient and/or circular economy adapted products, production technologies and processes	The financing or refinancing contributing to eco-efficiency and circular adapted products and production processes. • Investments in resource efficient products and solutions, such as new net and packaging designs focused on reducing, recycling and replacing plastic raw material. This can include light-weight packaging materials, developing mono-material solutions that are easier to recycle, finding compostable packaging alternatives and replacing plastic packaging by cardboard alternatives.	**Medium Green** ✓ Mowi has several targets related to plastic use in its Sustainability policy. ✓ Investments in this category can make significant contribution to reduced use of plastic raw material, while completely phasing out the use of such.

Table 1. Eligible project categories

Background

Aquaculture is a booming industry, and surpassed fisheries as the main provider of seafood globally in 2014. No reliable estimate of aquaculture's contribution to global GHG emissions exist. Aquaculture sits within a complex map of regulatory contexts and voluntary certification schemes.[1] The Aquaculture Stewardship Council (ASC)[2] is regarded as the strictest voluntary certification scheme on environmental criteria[3]. Its standards are stricter than Norwegian regulation, which is already stricter than other national regulations[4]. The ASC is an independent, international non-profit organization that manages certification and labelling for responsible aquaculture. Its certification scheme includes criteria relating to fish escapes, nutrient release, biodiversity, use of medicines and sustainable feed ingredients. In addition to environmental indicators, the ASC criteria also contains numerous social indicators to ensure that salmon farming is undertaken in a socially acceptable manner.

In comparison with other protein sources, the carbon footprint of farmed salmon is relatively low. A study from 2009 found it has a very similar-sized footprint to wild-caught cod, while higher than, for example herring and mackerel[5]. A recent study finds that it has a lower climate footprint than pork and beef, while higher than chicken.

[1] Shallow returns? ESG risks and opportunities in aquaculture. Available at www.fairr.org

[2] https://www.asc-aqua.org/what-we-do/our-standards/farm-standards/the-salmon-standard/

[3] https://www.bestfishes.org.uk/wp-content/uploads/Accreditation-table-v1.1.pdf

[4] Vormedal, I. and Gulbrandsen, L. (2018). Business interests in salmon aquaculture certification: Competition or collective action? *Regulation & Governance.*

[5] Ziegler, F. et al 2012. The Carbon Footprint of Norwegian Seafood Products on the Global Seafood Market. *Journal of Industrial Ecology 17*(1):103-117.

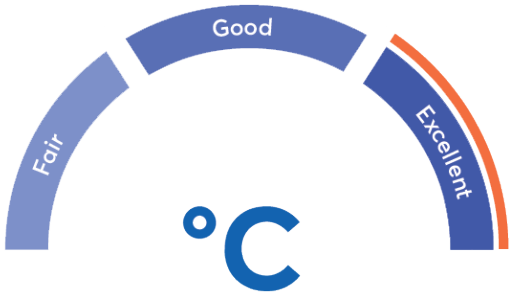
The footprint (at slaughter) is made up almost entirely by the feed production.[6] Notably, footprint estimates do not capture emissions from land-use change caused by converting natural land to agricultural land, as no methodology exists. Aquaculture is the largest source of demand for soy imports to Norway. There are concerns that demand for soy contributes to demand for tropical deforestation, and thus to GHG emissions and other negative environmental impacts. Soy protein concentrate (SPC) make up 10-26% of the feed produced in Norway, and most of it is imported from Brazil[7]. Mowi uses approximately 12% SPC in its feed, all of it from Brazil.

Processing and packaging add relatively smaller amount of carbon to the final product's footprint. Transport by truck within Europe also accounts for considerably smaller shares of the footprint than the feed production does. However, air transport over long distances, which increases the product's footprint manifold.[8]

Governance Assessment

Four aspects are studied when assessing the Mowi's governance procedures: 1) the policies and goals of relevance to the green bond framework; 2) the selection process used to identify eligible projects under the framework; 3) the management of proceeds; and 4) the reporting on the projects to investors. Based on these aspects, an overall grading is given on governance strength falling into one of three classes: Fair, Good or Excellent.

Mowi has environmental policies and Science Based Targets (SBT) regarding absolute emissions reduction throughout the full value chain (Scope 1, 2 and 3) in place. In addition, Mowi aims to have all aquaculture sites ASC certified by 2025 and has an overarching sustainable food policy in place that provides an additional safeguard against contributing to demand for deforestation. The issuer does not yet report in accordance with TCFD recommendations, but has identified some climate risks and opportunities. Mowi has established a green bond committee that includes the Chief Sustainability Officer and that decides in consensus after projects have already been pre-selected in a first step together with environmental experts. Mowi also commits to report on several indicators, largely on a project-by-project level, but does not obtain third party verification for its impact reporting. The overall assessment of Mowi's governance structure and processes gives it a rating of **Excellent**.



Strengths

The ASC is regarded as the strictest certification scheme in terms of environmental criteria. A site that loses its ASC certification due to violation of its criteria will be excluded from the framework. Mowi's sustainable feed policy provides a stronger safeguard against deforestation than the ASC currently does. The specific requirement for ProTerra certification or equivalent applying to parts of this framework is even stricter. Mowi currently uses a lower proportion of soy in its feed production than most other Norwegian producers, and has informed us that from 2020, 100% of it will be certified by ProTerra or an equivalent scheme. Furthermore, Mowi has informed us that it is in a dialogue with its SPC suppliers to encourage actions to ensure that their farmers preserve all forest on their land. Mowi was ranked number one in the Coller FAIRR Protein Index for 2019, which ranks the largest global meat, dairy and fish producers by looking at risk factors ranging from antibiotics use to deforestation and labor abuses.

[6] Ziegler, F. et al 2012.
[7] Regnskogsfondet og Framtiden i Våre Hender 2017. Fra brasiliansk jord til norske middagsbord. En rapport om soya i norsk laksefôr.
[8] Ziegler, F. et al 2012.

As most marine aquaculture sites are open systems, effluents and waste water discharge can cause toxic algae blooms and negative effects on wild fish. This framework includes investment categories aiming to reduce these problems.

It is a strength that investments and expenditures for fossil fuel machinery and/or equipment is not eligible for Green Bond financing. This is in line with Mowi's decarbonization strategy.

Weaknesses

There are no major weaknesses in this framework

Pitfalls

The largest climate impact from salmon aquaculture is through marine and agricultural inputs to feed production. Around one fifth of the world's commercially caught fish is used for fishmeal and fish oil, which are important ingredients in aquaculture feed[9]. Aquaculture is not a full solution to depleting fish stocks until this dependence is severely reduced[10]. The ASC and Mowi's sustainable feed policy limit but do not eliminate the use of these inputs.

The ASC criterion on soy certification does not provide an adequate safeguard against contributing to deforestation demand. The ASC requires soy to be certified by the Roundtable for Responsible Soy (RTRS). For a property to be RTRS[11] certified, no native forests have been cleared or converted later than May 2009. Stricter rules apply for land conversions later than June 2016, after which no conversion of natural land can have taken place. RTRS offers two alternative soy certificates. The strictest alternative (Segregation) ensures that the soy from certified properties is kept physically separate from soy from non-certified properties. The Mass Balance alternative allows for physical mixing in storage, transport, and processing, as long as the share of soy sold as certified equals the share of soy produced on certified properties. For ProTerra[12] certification, areas of native vegetation cannot have been cleared or converted after 2008. A comparison with RTRS finds that it has stricter criteria in many areas, but is weaker on transparency[13]. ProTerra does not allow physical mixing. Most SPC imported to Norway is ProTerra certified[14], and Mowi has informed us that from 2020, it will purchase only soy certified by ProTerra or an equivalent scheme. Its sustainable feed policy (which applies both to feed produced and purchases) does not rule out RTRS Mass Balance, but the company has informed us that they will clarify their policy so that that if soy is purchased under RTRS, the segregation module should be prioritized. The ASC's requirement on soy is weaker, as it accepts RTRS Mass Balance, and because it set a five-year grace period when it introduced the requirement in 2017. The Sustainable Feed and Sustainable fish farm categories in this framework require ProTerra, or a certificate with equivalent requirements, which we regard as strongest available safeguard against soy-related deforestation.

A problem with all certification schemes is that major soy producers currently only certify a small share of their production, while the rest may contribute to deforestation. Mowi has informed us that it is in a dialogue with its SPC suppliers to encourage actions to ensure that their farmers preserve all forest on their land.

[9] Cashion, T. et al. (2017) Most fish destined for fishmeal production are food-grade fish. Source: https://onlinelibrary.wiley.com/doi/full/10.1111/faf.12209
[10] Shallow returns? ESG risks and opportunities in aquaculture. Available at www.fairr.org
[11] Roundtable for Sustainable Soy 2017. RTRS Standard for Responsible Soy Production Version 3.1
[12] ProTerra Standard – Social Responsibility and Environmental Sustainability. Version 4.1 – September 25, 2019
[13] Regnskogsfondet og Framtiden i Våre Hender 2017
[14] Regnskogsfondet og Framtiden i Våre Hender 2018. Salmon on soy beans – Deforestation and land conflict in Brazil.

If transported by air, this increases the carbon footprint of the final product manifold. Transport by road also produces emissions, but only accounts for a small portion of the footprint.

Aquaculture entails risks of several forms of local environmental degradation. Fish escapes pose a serious threat to wild salmon stocks, as the farmed fish modify the gene pool and outcompete local species. In 77 out of 147 rivers sampled in Norway, researchers found wild salmon impacted by gene flow from farmed salmon[15] One major cause of escape incidents is extreme weather. The frequency and severity of such weather events are expected to increase as a result of climate change. The ASC certification aims to reduce this threat by setting a stricter limit than Norwegian regulation on the number of escaped fish tolerated but has been criticized for not being strict enough.

[15] Karlsson, S. et al. (2016) Handling editor: W. Stewart Grant, Widespread genetic introgression of escaped farmed Atlantic salmon in wild salmon populations, ICES Journal of Marine Science, 73(10): 2488–2498. https://doi.org/10.1093/icesjms/fsw121

Appendix 1:
Referenced Documents List

Document Number	Document Name	Description
1	Mowi's Green Bond Framework, January 2020	
2	Mowi's Sustainability Strategy	Mowi's plan for leading the blue revolution
3	Salmon Farming: Industry Handbook 2019	Handbook describing Mowi's overview of the salmon farming industry for investors and financial analysts.
4	Code of Conduct	Mowi's code of conduct policy
5	Mowi's policy on sustainable salmon feed	Mowi's ustainability policy for salmon feed
6	CDP 2018	Mowi's responses to CDP for 2018
7	Annual report 2018	
8	Policy on sustainable salmon feed	Mowi's policy to ensure sustainable sourcing of inputs to the feed it produces and purchases

Appendix 2:
About CICERO Shades of Green

CICERO Green is a subsidiary of the climate research institute CICERO. CICERO is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international cooperation. CICERO has garnered attention for its work on the effects of manmade emissions on the climate and has played an active role in the UN's IPCC since 1995. CICERO staff provide quality control and methodological development for CICERO Green.

CICERO Green provides second opinions on institutions' frameworks and guidance for assessing and selecting eligible projects for green bond investments. CICERO Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO Green is independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure. CICERO Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

We work with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions (ENSO). Led by CICERO Green, ENSO contributes expertise to the second opinions, and is comprised of a network of trusted, independent research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute, the Institute of Energy, Environment and Economy at Tsinghua University and the International Institute for Sustainable Development (IISD).