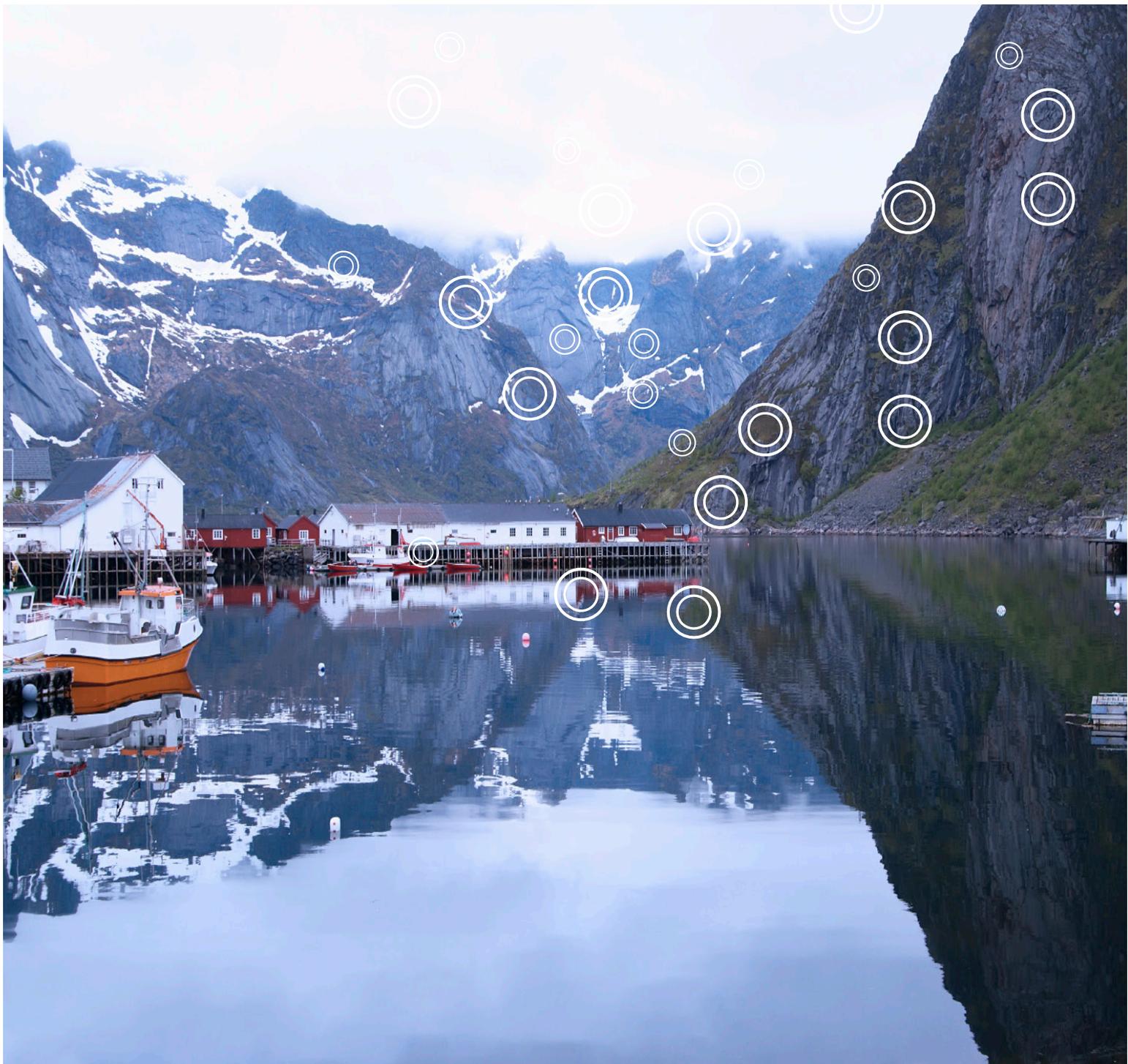


Summary: Sustainable innovation in the Nordic marine sector



This is the executive summary of the report “Sustainable innovation in the Nordic marine sector”, which has been developed by SIGLA on behalf of Nordic Innovation.

The full report (in Norwegian) can be found on <http://www.nordicinnovation.org/>

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SIGLA

Sustainable innovation in the Nordic marine sector

In 2050 the world will have three billion more middle class consumers and population will have grown from seven to nine billion people. Access to fish is essential in order to feed this population. Sustainable innovation in the food sector, which can improve access to protein in an environmentally sustainable way, is therefore of primary importance.

This study assesses the question “why and how do selected companies in the Nordic marine sector succeed in integrating sustainability in their innovation processes and business model?”. Our findings may help Nordic Innovation and other innovation agencies foster supportive frameworks for sustainable innovation and green growth in the Nordic region. The findings also provide companies in the Nordic marine sector with ideas on how they can promote sustainable innovation within their own operations.

The study draws on sector specific analysis, media reports, research articles and overviews of regional and national regulation. We have also conducted interviews with centrally placed experts. We use this material to provide an overview of key trends on sustainability in the marine sector. The study then presents seven case studies of companies that have succeeded with sustainable innovation: Matorka (ICE), Aker BioMarine (NO), Lyngsoe Systems (DK), Marine Harvest (NO), Salmon from the Faroe Islands (FO), EWOS (NO) and Kerecis (ICE). Sources for these case studies are interviews with company representatives, annual reports and sustainability reports. These case studies are designed to illustrate the companies’ understanding of why and how they have succeeded. An objective evaluation of the companies’ sustainability performance is beyond the scope of this study.

Sustainable development in the marine sector may be defined as fishery and aquaculture activity implemented in a way, which ensures that

- Marine resources can be harvested at solid levels now and in future generations (protect fisheries)
- The activity does not entail pollution or unwanted change in marine ecosystems, including biodiversity (avoid pollution)
- The activity caters to the long-term needs of fishermen, companies and consumers (feed the world)

Sustainable innovation entails new products, services, production methods or models of organisation, which, in a profitable way, contribute to solving or mitigating the above sustainable development challenges (protect fisheries, avoid pollution, feed the world).

Laws and regulations have been central sustainability drivers in the marine sector. At the same time, some marine sector companies have independently identified sustainability related risks as important to their business operations and, often at the sector level, taken measures that go beyond basic legislative requirements. These companies recognise that they depend on a vulnerable resource (fish) and that they are faced with demands and expectations from society. The retail sector, rather than the end consumer, is the primary driver behind these, along with environmental organisations. Both groups are asking companies to act sustainably and provide documentation on their sustainability track record.

The companies in the Nordic marine sector have no unified approach to sustainability. In a survey of the major companies done for this study we find that some companies report extensively on their sustainability performance, but the majority does not stress or even use these aspects in their external communication.

The Nordic marine sector is shaped by a dense network of laws and regulations that work in combination with voluntary arrangements such as standards and certifications. The nature of these formal and informal requirements differs from country to country. The EU provides much of regulations for member countries Denmark, Norway and Sweden, while for Norway, Iceland and the Faroe Islands, national regulations hold the greatest sway. The reform of the EU Common Fisheries Policies (CFP) will come in 2013 and is expected to bring radical change. Sustainability will be one of three core principles and the reformed CFP will no doubt be a key shaper of the market. Nordic companies need to understand what changes lie ahead and what risks and business opportunities they face as a result of regulatory changes.

Certification is, perhaps surprisingly, not a major driver of sustainability. There is a plethora of organisations and schemes that signal a range of different demands on companies. This causes confusion and undermines the effect these provisions could have had. One partial exception is the Marine Stewardship Council (MSC), which has been able to draw relatively high levels of commitment from companies, retailers and sector organisations alike.

Key success factors for sustainable innovation

We have selected seven companies as case studies of how and why they succeed with sustainable innovation. Key learnings on how and why the companies succeeded with sustainable innovation include:

Thinking ahead: For most of the companies, there is a connection between sector survival and sustainability considerations, and this is often linked to raw material access. This can trigger sustainable innovation as in the case of Aker BioMarine, who depend on Antarctic krill and use its new eco-harvesting technology in order to manage this resource sustainably. Several companies stress the importance of management understanding of sustainability and a long-term view of the company. This is important in explaining why and how companies initiate and succeed with sustainable innovation (EWOS and Marine Harvest). A further distinguishing feature is an ability of the management to think beyond today's market: These are companies that position themselves for, and shape, what customers and consumers will demand in the future (Matorka's positioning of sustainable Icelandic tilapia).

Fish + x = true: An interesting phenomenon surfaces in three of our case studies: Companies that combine activities and resources from two different sectors obtain a solid starting point from which to explore opportunities for innovation. Matorka discovered new feed solutions by switching from cooperation with aquaculture feed producers to fodder producers for the agricultural sector. Aker BioMarine drew on the company's combined fisheries and industrial expertise when developing their new methods for krill harvesting. Kerecis combines sophisticated medical expertise with insights from the Icelandic fisheries sector.

Innovation: Radical or stepwise: Innovation can unfold as an incremental process of improvements or as leapfrogging, but may still hold equal chances of succeeding. EWOS is gradually reducing the share of marine ingredients in its feed products. Lyngsoe Systems is creating software for traceability as an extension of a system for registration of fish containers. Other companies, by contrast, are challenging existing business models. Matorka uses waste from arctic charr in the production of tilapia, while Kerecis creates advanced medical products from fish waste. Both radical and step-by-step approaches can work well as a tool for sustainable innovation.

Proactive approaches to regulation: Regulations shape the activities of all marine sector companies and increasingly encompass sustainability concerns and requirements. Companies can approach this in two ways. One is to capitalise on existing regulations and search for business opportunities. In Denmark, full traceability is a formal requirement from 2012 and Lyngsoe Systems supplies software solutions that enable this. Secondly, companies can work to shape future regulation in a way that serves both sustainability and company interests. EWOS works for comprehensive certification schemes and regulation for suppliers to the feed industry, which it believes will make EWOS more competitive and perhaps outcompete companies who have not started working on sustainability.

Friendly with R&D: All the case studies companies stress the importance of research and development and see it as a pre-requisite for sustainable innovation. They differ, however, in how they draw on research. The larger companies (Marine Harvest, Aker BioMarine, EWOS) have in-house R&D units that can develop and test new solutions. Others (Kerecis, Matorka) have connected with external research environments. Aker BioMarine also cooperates closely with the environmental organisation WWF-Norway, which holds considerable expertise, albeit not a research institute as such. Several of the companies monitor research in other sectors and countries that can be transferred or even copied into their own operations.

Innovation across the value chain: The larger companies in this study, Aker BioMarine and Marine Harvest in particular, stress that tight vertical integration fosters sustainable innovation since it entails good access to expertise and resources, including the possibility of testing new solutions. The smaller companies are compensating for the absence of vertical integration through cooperation with suppliers and other actors outside of the sector. This type of cooperation requires trust. Companies that succeed in establishing trust also create a fertile environment in which to experiment, learn and test with partners. This creates an environment conducive to sustainable innovation.

Use the whole fish: Several of the companies use the whole fish, creatively and efficiently. Matorka exploits the waste from the production of arctic charr in the production of tilapia, thereby creating an almost closed loop system. Kerecis has built its entire business concept on the use of fish-waste for the production of advanced medical products. These approaches can reduce costs, create efficient production processes and generate new income.

Based on the above key success factors we highlight a set of recommendations for Nordic innovation agencies and for Nordic companies in the marine sector.

Innovation agencies

Constructive combinations: Map sectors that may be constructively paired with the marine sector. This study has shown that cooperation between different sectors can be a trigger for sustainable innovation. Agriculture, medicine and IT are relevant examples of such sectors.

Learn from others: Enable Nordic companies to learn as efficiently and effectively as possible from others. Three types of learning are especially important: 1. Copying what others are doing (“copy cat”); 2. Use insights from NGOs (“sleeping with the enemy”), and; 3. Map achievements by other innovative companies in the Nordic region with similar activities (“who is who in the Nordics”)

Change attitudes: Fish is strategic: Promote the strategic qualities of the sector so that government, investors and consumers acknowledge and fully utilise the potential that is associated with it. This includes acknowledging the high-tech initiatives taken across the sector and the considerable competitiveness of the sector.

Drive ‘profitable’ sustainability regulations: Three initiatives may be particularly helpful: 1. Identify business opportunities associated with sustainability regulations and assist companies with reaping the benefits of these. 2. Scan the horizon for how upcoming regulations may shape the market and help identify companies position to manage the ensuing risks and opportunities 3. Support companies with a sustainability focus through working to realise regulations that promote and reward sustainable products and processes and make these more attractive and profitable than their competitors.

Support basic research: Stress the importance that basic research holds for the sector as a whole. Several companies in this study report that access to research addressing the more fundamental puzzles and challenges is helpful and relevant in their innovation work. Nordic innovation agencies can survey what kinds of basic research would be particularly beneficial for some of the cutting edge and competitive products and methods that are emerging in several Nordic countries, such as feed to the aquaculture sector and use of fish-waste in products outside the marine sector.

Use sustainability as criteria for support and funding: Introduce a “sustainability filter” (minimum requirement) for all companies receiving innovation support. Likewise, the companies with particularly good track records on sustainable innovation could be especially rewarded.

Companies

Use the whole fish, including waste: Waste and by-products are potential sources of innovation that can reduce costs (using it makes less waste to be rid of), increase income (new or better products) and enable a sustainable production (continued access to raw materials). Assess if and how the company uses all possible parts of the fish and what opportunities that are not utilised in the current production – either internally in the company, by customers, suppliers or others.

Others may know more than you: New ideas and possibilities for innovation do not necessarily originate in the company itself. Draw on external research groups, environmental organisations and other companies in the Nordic region and beyond.

Look into the future: Understand what the world will look in 2025 and assess whether the company's business model is fit for purpose in various scenarios. It is especially important to assess questions associated with 1. Raw materials (access to resources, price, volatility and sustainability), 2. Future demand (what products will be demanded, how should they be made) and 3. Regulations (on the environment, fish health and sustainability).

External implementers: Engage external actors (in the same sector, outside the sector, in government or organisations) when the company has new process or product ideas, but lacks resources, capacity or competence to execute.

Find new friends: innovation can occur in instances when fish mixes with other products and branches (suppliers, sectors and partners) that may benefit from products or by-products from the marine sector.

You do not need to be an 'innovation wizard' to do well: Do not wait for the one big idea. Rather, start by searching for improvements, what can we use less of, what can be replaced, how can we become environmentally smarter or more efficient. A stepwise approach can also lead to sustainable innovation.

Regulations can make sustainability pay off: Regulation is a strong driver for sustainable innovation. Companies should 1. Understand what regulations make it profitable to be sustainable (or too expensive not to be) and capitalise on that. 2. Be a promoter for new regulation that can make it profitable to be sustainable and through this outcompete those that are neither serious nor sustainable.

Highlights from the case studies

The aim of the case studies is to explore the question of how and why some companies in the Nordic marine sector succeed with sustainable innovation. Our selection criteria included a wish to study companies from different Nordic countries and sectors: We aimed for a good spread between harvest and aquaculture companies and sought to include attention to the supply and processing sectors.

Matorka: A revolution in sustainable aquaculture? Matorka uses geothermal energy for the production of arctic charr and tilapia in land based fish farms. The company combines its aquaculture activities with production of plants that later form part of the feed for the fish. Water and nutrients are channelled through the production systems so that the waste in one section becomes feed in another.

Aker BioMarine: Cooperating with environmental organisations to develop sustainable harvesting techniques and competitive advantage: Aker BioMarine has dramatically changed the harvest of krill in the Antarctic by developing a new harvesting technique with key sustainability, as well as efficiency gains. The company uses krill to develop high-end products such as fish oils for human consumption. Aker BioMarine received the Marine Stewardship Council certification in 2010 and cooperates closely with WWF.

Lyngsoe Systems: Using the power of IT to promote sustainability. Lyngsoe Systems is pioneering the development of electronic traceability solutions in the marine sector. The software allows for easy entry of key data at all stages of the value chain. The information system will enable consumers to make more informed choices about the fish they are purchasing and also increase the data available for the scientists setting the quotas for the Danish fisheries.

Marine Harvest: New and sustainable approaches to tackling sea-lice: Marine Harvest is one of the world's largest aquaculture firms and is engaged in R&D on a number of fronts. A recent interesting initiative is efforts to scale up the availability and use of wrasse (Labridae) in fish farms. The Wrasse eats sea-lice and thereby constitutes a natural method for the removal of lice on farmed salmon.

Salmon from the Faroe Islands: A turnaround from infections and economic crisis towards sustainability and profits: Faroe Island fish farms were hit by a devastating disease in 2003. This triggered a rethink among authorities and companies alike. The companies advocated for new strict regulations and considerable innovation in aquaculture management occurred. This has enabled Faroe Island farmed fish to enjoy some of the best results on fish health and sustainability – and the producers can offer predictable, high-quality and sustainable salmon to the world market.

EWOS: Protecting wild fish stocks by reducing marine ingredients in feed to the aquaculture sector: EWOS has experimented with the reduction of marine ingredients and found that good production levels can be maintained even at low levels. This makes the company and the sector less vulnerable to price shocks and potential shortages in the supply of marine ingredients and may help the salmon aquaculture sector in becoming a net protein producer in the future.

Kerecis: Using fish-waste to produce high-end medical products: Kerecis uses fish skin (waste product from the farming of Icelandic cod) as raw material in producing sophisticated products to treat tissue damage; for example in chronic wounds and in hernia ruptures. Fish skin has treatment and cost advantages over other raw materials such as pig skins.



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Our mission is to stimulate innovation, remove barriers and build relations through Nordic cooperation. We encourage innovation in all sectors, build transnational relationships, and contribute to a borderless Nordic business region.

We work with private and public stakeholders to create and coordinate initiatives which help Nordic businesses become more innovative and competitive.

Nordic Innovation Centre is located in Oslo, but has projects and partners in all the Nordic countries.

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