

10th edition

# The Norwegian aquaculture analysis 2025

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# An introduction

Dear reader,

With this edition, we are celebrating the 10th anniversary of the Norwegian Aquaculture Analysis! Over the past decade, Norway’s aquaculture industry has undergone profound changes, evolving from a sector focused primarily on production growth to one navigating an increasingly complex landscape of technology, regulatory changes and sustainability requirements. This anniversary edition provides an opportunity not only to reflect on the journey so far but also to look ahead at what may shape the next decade.

The last 10 years have been characterized by strong international demand for Norwegian salmon, driving expansion and innovation across the value chain. The seafood markets have remained resilient, although not untouched, through important geopolitical events and pandemics in the latter half of the decade. At the same time, the industry has struggled to overcome the continued biological challenges related to sea lice and fish welfare, causing increasing environmental scrutiny. Regulatory frameworks have shifted significantly, culminating in measures like the resource rent tax and a trend toward more impact-based regulation.

Higher public scrutiny drives technological progress which has been a defining feature of this period. From the development

of alternative production technologies to advanced monitoring systems and digitalization, innovation is key for producers to improve efficiency and reduce environmental impact. The rise of land-based farming and offshore concepts signals a potential new era of diversification. The tech race is still ongoing, and more clarity is needed around what technological solutions will best balance fish welfare, economics and sustainability.

In this anniversary edition, we allow ourselves to reflect on the development we have witnessed over the past 10 years, in addition to exploring some of the topics shaping the industry today and tomorrow:

- Innovation and adoption trends in production technologies
- Status and developments in sustainability reporting and actions
- Latest status of land-based farming
- How to deal with customs and VAT in the current global seafood environment

The next decade will bring both opportunities and challenges. We expect continued global demand for sustainable protein, reinforcing aquaculture’s strategic importance. Regulatory frameworks will likely become more impact-driven, rewarding low-emission and welfare-friendly operations. Technological innovation

– including AI-driven monitoring and feeding, closed containment systems, and offshore farming – will accelerate reshaping production models. At the same time, climate change and biodiversity concerns will demand bold action and collaboration across the value chain. Financial markets and investors will increasingly favor companies that demonstrate resilience and sustainability. In short, the industry’s future will be defined by its ability to combine growth with responsibility.

As a multidisciplinary service provider to the industry, the EY organization combines deep sector knowledge with its core professional offerings – consulting, strategy and transactions, tax and legal services, audit, and accounting. Our dedicated seafood sector teams, strategically located in key seafood clusters and marketplaces across the globe, enhance our ability to provide tailored solutions that address the distinctive challenges and opportunities within aquaculture.

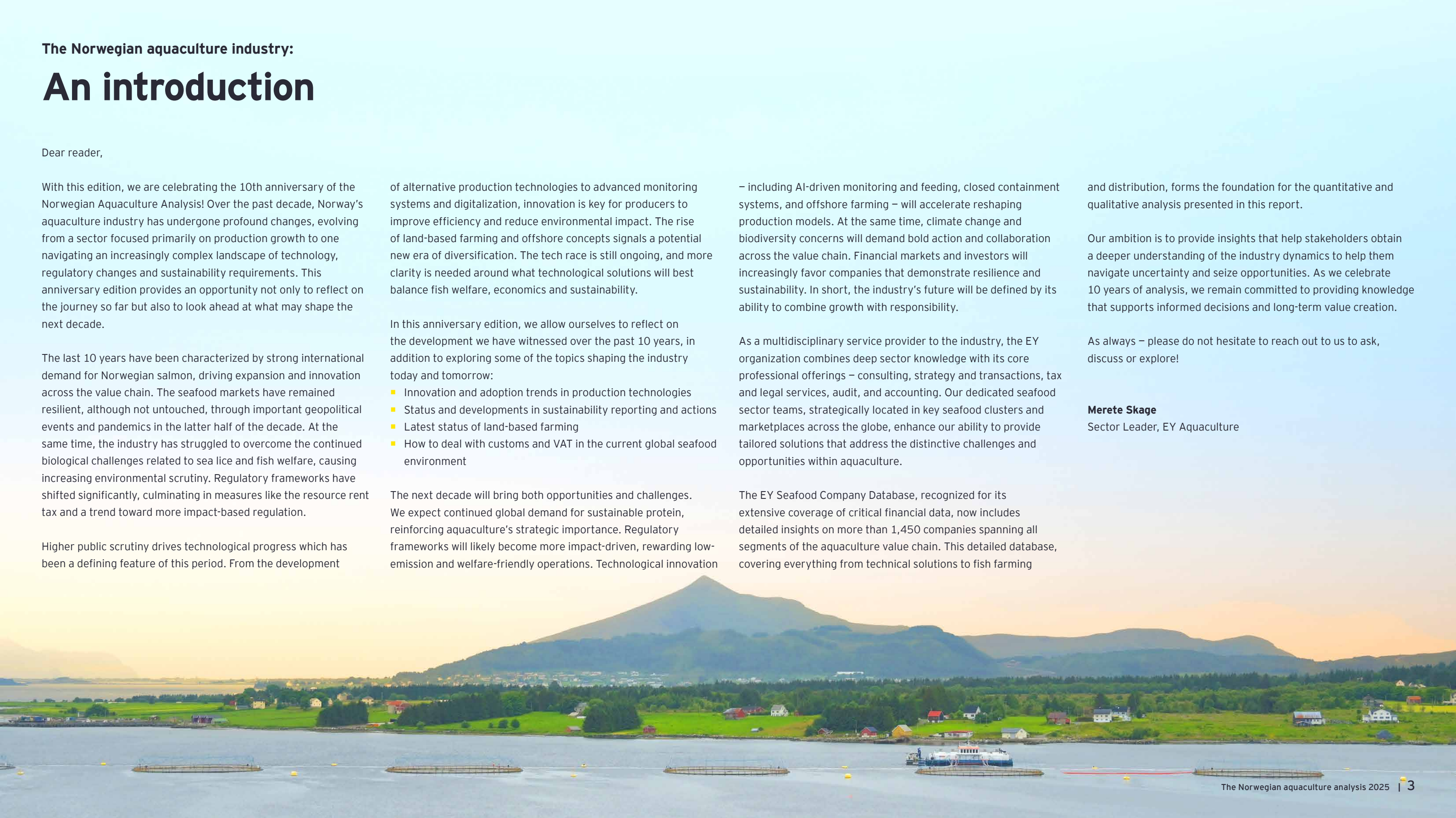
The EY Seafood Company Database, recognized for its extensive coverage of critical financial data, now includes detailed insights on more than 1,450 companies spanning all segments of the aquaculture value chain. This detailed database, covering everything from technical solutions to fish farming

and distribution, forms the foundation for the quantitative and qualitative analysis presented in this report.

Our ambition is to provide insights that help stakeholders obtain a deeper understanding of the industry dynamics to help them navigate uncertainty and seize opportunities. As we celebrate 10 years of analysis, we remain committed to providing knowledge that supports informed decisions and long-term value creation.

As always – please do not hesitate to reach out to us to ask, discuss or explore!

**Merete Skage**  
Sector Leader, EY Aquaculture





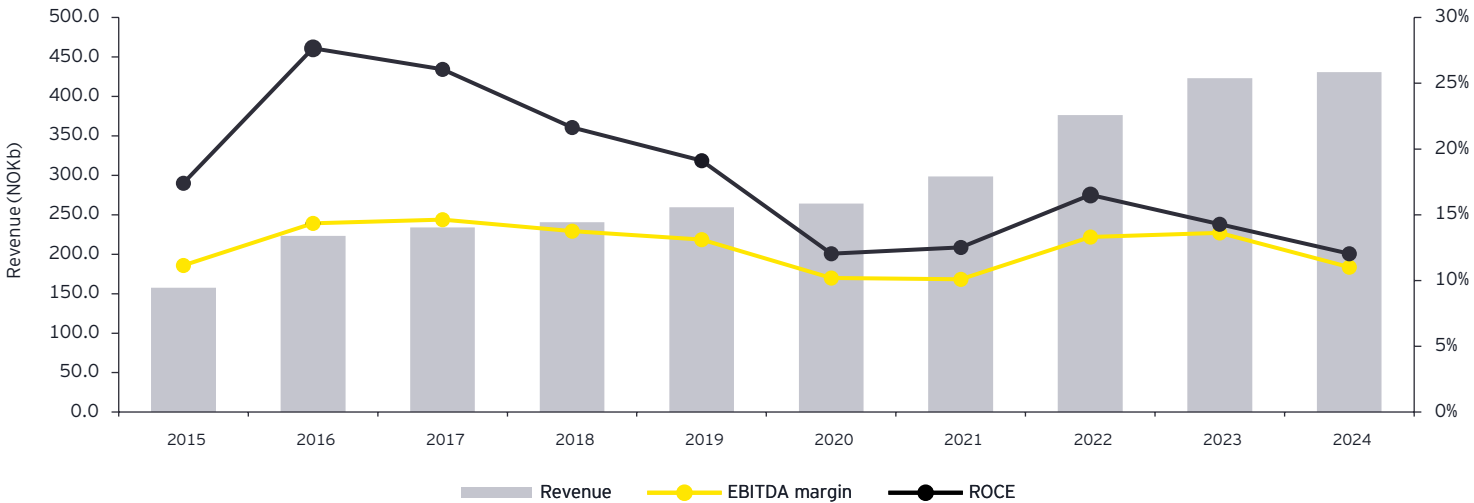
# Norwegian aquaculture industry highlights 2015-24

While the Norwegian aquaculture industry’s topline growth continues, the growth subsided in 2024. The salmon price was relatively stable year-over-year, and the same can be said for farming volumes.

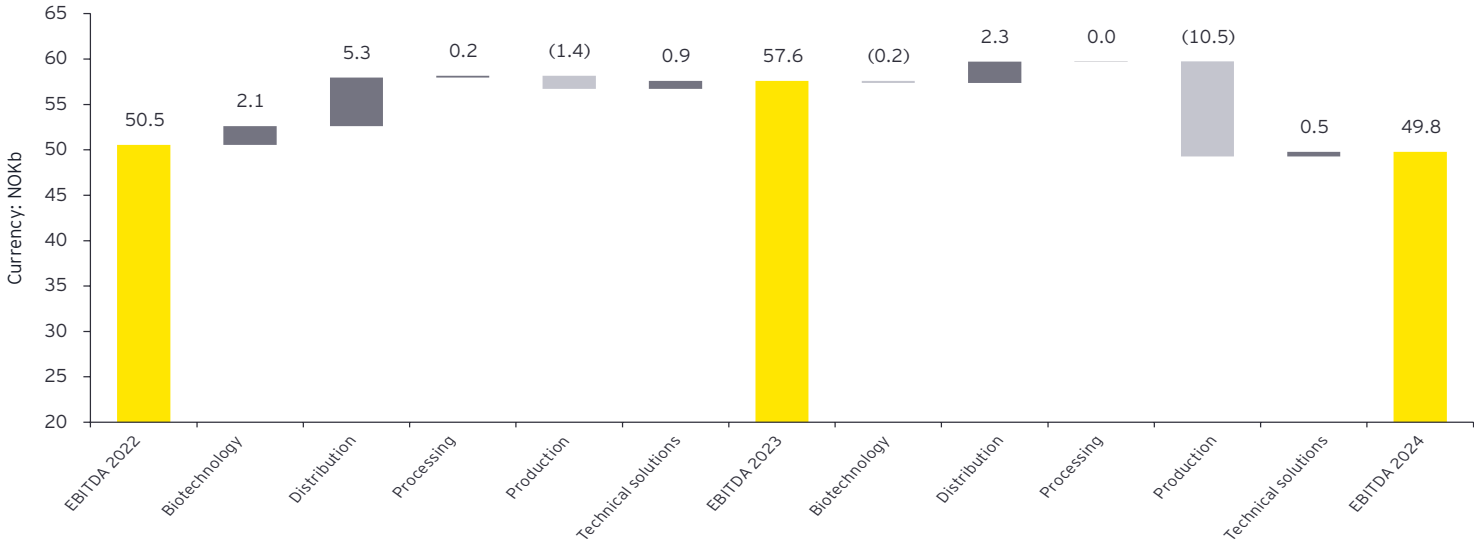
EBITDA took a significant dive in 2024, driven by the production segment which continues to experience unfavorable production cost development. The distribution segment was the real EBITDA winner, and all three subsegments experienced EBITDA growth – with both the trading and transportation on sea subsegments seeing their EBITDA grow with NOK 1b or more.

In the following pages, we will discuss the key changes that have taken effect since the previous edition of this report. In celebration of the 10-year anniversary of the report, we will take a look at the past decade and provide some of our perspectives on the next decade.

Norwegian aquaculture industry highlights 2015-24



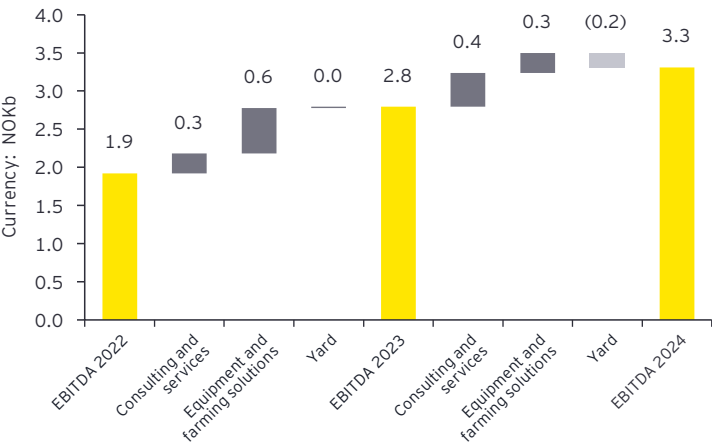
EBITDA bridge 2022-24



# Technical solutions

## Moderate revenue growth and high margin achievements

Segment EBITDA bridge



The technical solution segment has seen some volatility in the growth the last 10 years, switching between periods with double- and single-digit growth. Over the last three years, revenue growth has remained in the single-digit realm, with 2023 only returning 2.4%. In 2024, the growth rate increased to 5.9%, but still some way from the higher growth rates generated in the past. Naturally, there are quite large differences between the different companies within the various subsegments.



Companies report a rising optimism following some challenging years in the market, primarily driven by a slowdown in investments among customers due to the Norwegian government’s implementation of the resource rent tax of 25% for salmon producers. With the tax debate concluded, at least for now, companies report increased activity in the second half of 2023 and continuing into 2024 as the uncertainty in the market decreased. The logistical and supply chain challenges that put pressure on margins following the war outbreak in Ukraine have also been surpassed.

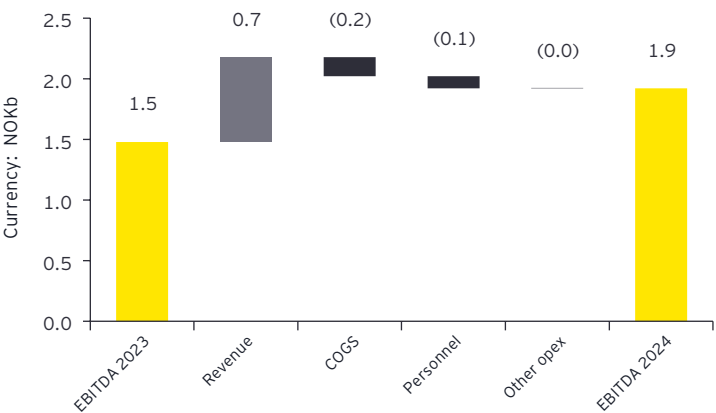
While revenue growth has been more modest compared to the historical period, EBITDA margins have reached the highest level since 2016 at 9.3%. Return on capital employed (ROCE) has also taken an upswing, landing at 10.7% in 2024. Both the consulting and services, and equipment and farming solutions subsegments have growth in EBITDA and ROC margins.

The EBITDA margin in the yard subsegment decreased from 9.5% in 2023 to 3.8% in 2024, underlining that 2023 was well above trend, and 2024 is roughly aligned with the decade’s average performance. Revenue in this subsegment tends to vary on a year-over-year basis, and 2024 was a year with a positive revenue development.

### M&A activity in the technical solution segment

In 2024 and 2025 (up to mid-October 2025), we observed 42 completed transactions involving companies within the technical solutions segment, compared to 58 transactions in 2023 and 2024. Of the 42 transactions, 26 occurred in 2024, while 2025 has seen a slightly slower pace with 16 transactions by mid-October. This segment remains of high interest to financial investors, but we also continue to see consolidation among the existing companies within the segment.

Consulting and services EBITDA bridge

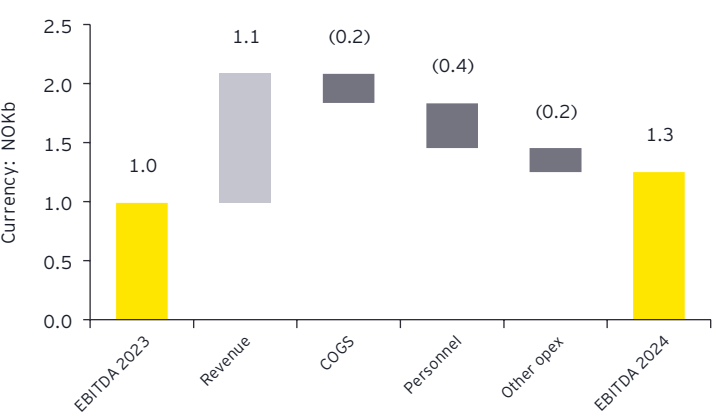


Topline growth in the consulting and services subsegment in 2024 ended at 7.5%, down from 9.9% in 2023. While the growth rate is moderate compared to the 10-year CAGR of 12.2%, EBITDA margins reached an all-time high of 19.1% in 2024. There are naturally large variations within the subsegment.

The service vessel operators experienced a massive growth of 22.5% in 2024 (5.9% in 2023), while the EBITDA margin reached 31.3% (16.3% in 2023). These companies report a strong market with a high activity level, and they have a positive market outlook.

Consulting and services continues to be the subsegment within technical solutions with the highest revenue growth and highest EBITDA margins.

Equipment and farming solutions EBITDA bridge



The equipment and farming solutions subsegment is still the largest subsegment within technical solutions. In 2024, they experienced a revenue growth of 5.2%, which is the best year-on-year growth since 2021. The positive topline development indicates that much of the uncertainty related to investments under the new resource rent tax appears to be resolved.

EBITDA margins have been under pressure for some time for this subsegment, but in 2024, margins ended at 5.7%, the highest margin achievement since 2017. The positive EBITDA margin development from 2023 to 2024 is observed for both large and mid-sized players, while we observe that margins remain under pressure for the small companies (revenue > NOK 100m).

Margins under pressure for small companies is not surprising. Many of these companies are involved in R&D and greenfield projects that have yet to mature or reach sufficient economies of scale to achieve sustainable margins.

# Biotechnology

## Strong revenue and growth

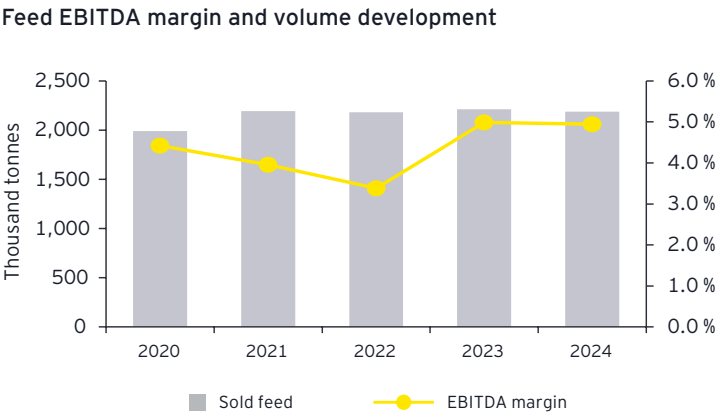
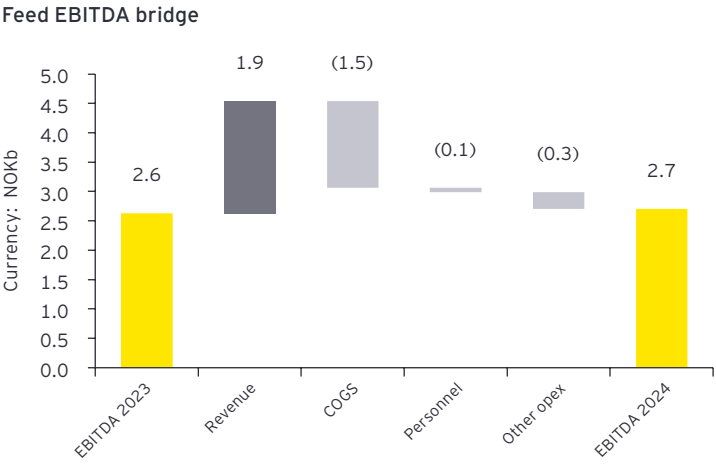
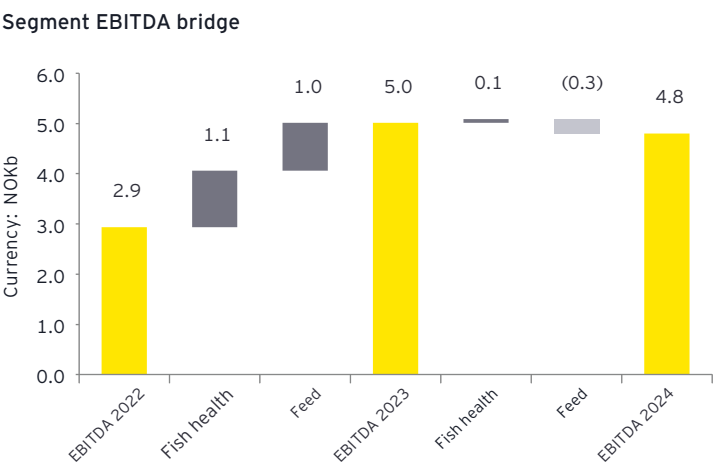
The biotechnology segment experienced double-digit revenue growth in 2023 (18.8%) and single-digit growth in 2024 (3.7%), reaching an all-time high revenue level of almost NOK 65b in 2024.

Both the feed and fish health subsegments achieved revenue growth in 2024, with a year-on-year growth of 4.1% for fish health and 3.6% for feed, which was a significant drop from the record revenue growth in 2023 of 19.5% and 18.7%, respectively. The two subsegments both decreased their margins from the record high margins in 2023. In 2024, the EBITDA margin for the biotechnology segment was 7.4%, down from 8.2% in 2023. The 2024 EBITDA margin is still the second highest recorded in the past five years, so the margin remains strong compared to the historical average.

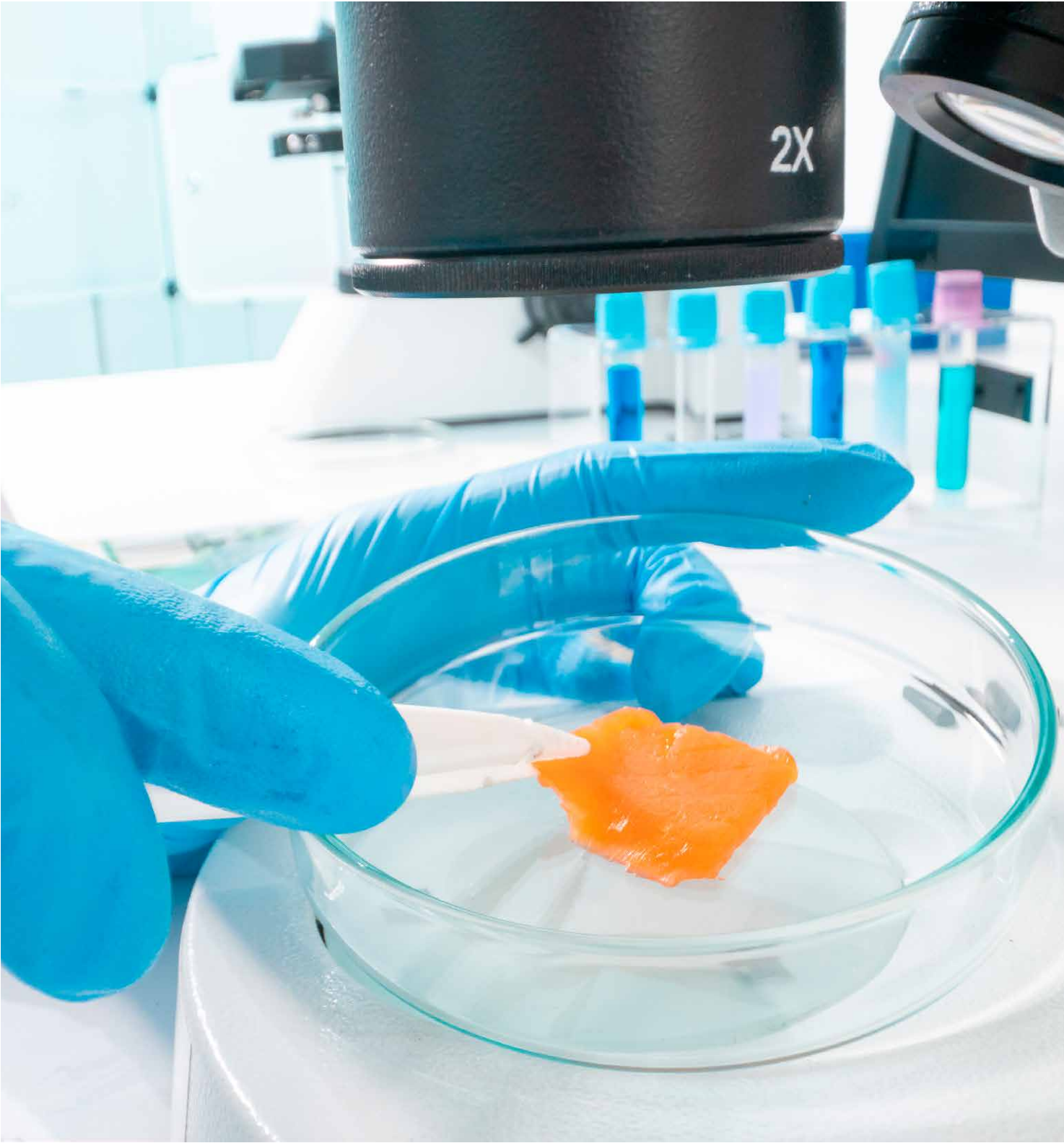
With mounting external pressures on the industry to enhance fish welfare, the fish health subsegment is anticipated to maintain its growth trajectory moving forward. Particularly, the genetics portion of the subsegment stands out as a growth driver in 2024.

From 2019 to 2022, there was a noticeable downward trend in EBITDA margins for the feed subsegment, largely attributed to the rising costs of raw materials and a more competitive landscape. The year 2023 marked a positive shift in this trend. In 2024, the EBITDA margins in the feed subsegment have been maintained from the strong 2023 performance.

The amount of sold feed has been relatively stable since 2021. In total, the feed producers sold almost 2.2 million tonnes of feed in 2024, according to the Directorate of Fisheries.

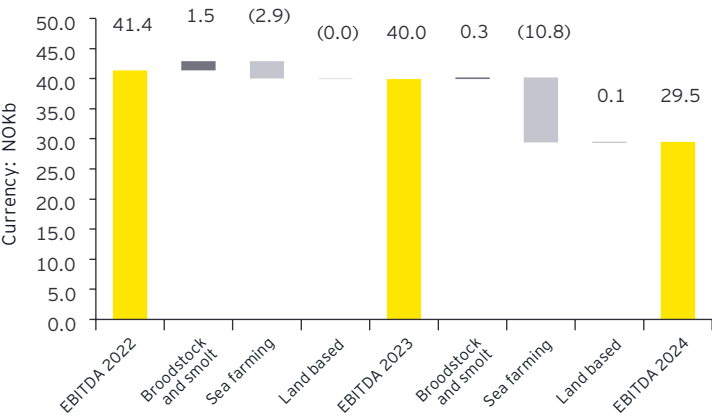


Source: Directorate of Fisheries, EY



# Production

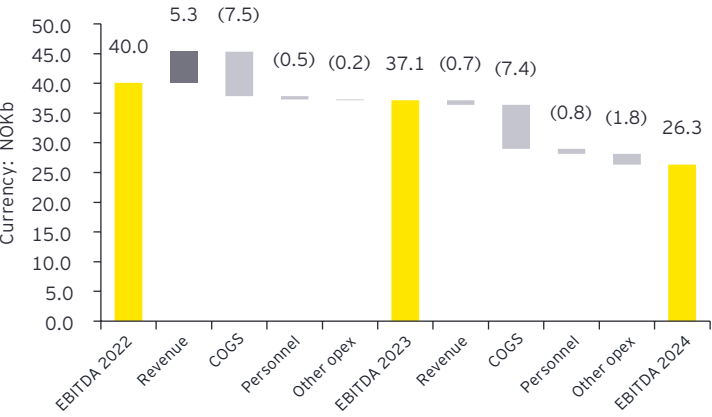
Segment EBITDA bridge



The production segment has demonstrated robust growth over the 10-year period analyzed. Two notable periods of acceleration occurred in 2016 and 2022, both driven by higher salmon prices. In 2023 and 2024, the dynamics were mixed: revenue continued to rise, while margins tightened due to increased costs. EBITDA margins improved for broodstock and smolt producers; however, persistent cost challenges in sea farming operations exerted pressure on margins.

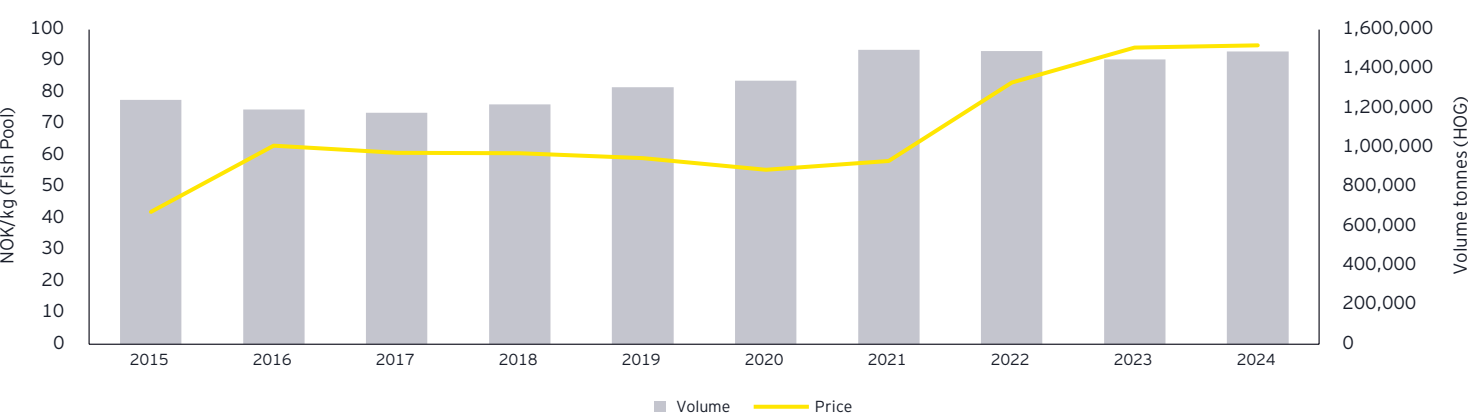
Following the introduction of the resource rent tax in 2022 and subsequent restructuring by many farmers, margins within the broodstock and smolt subsegment increased significantly. The EBITDA margin remained strong in 2024, though it declined slightly from 34% in 2023 to 32% in 2024 – which is still a significant improvement over the pre-resource rent tax EBITDA margin in 2022 at 25%. Despite the 2024 margin reduction, EBITDA for the subsegment increased in 2024, supported by approximately 15% revenue growth. We expect to see margins in this realm going forward, and in our view, this margin level is likely a better reflection of the actual underlying profitability in this subsegment.

Sea farming EBITDA bridge

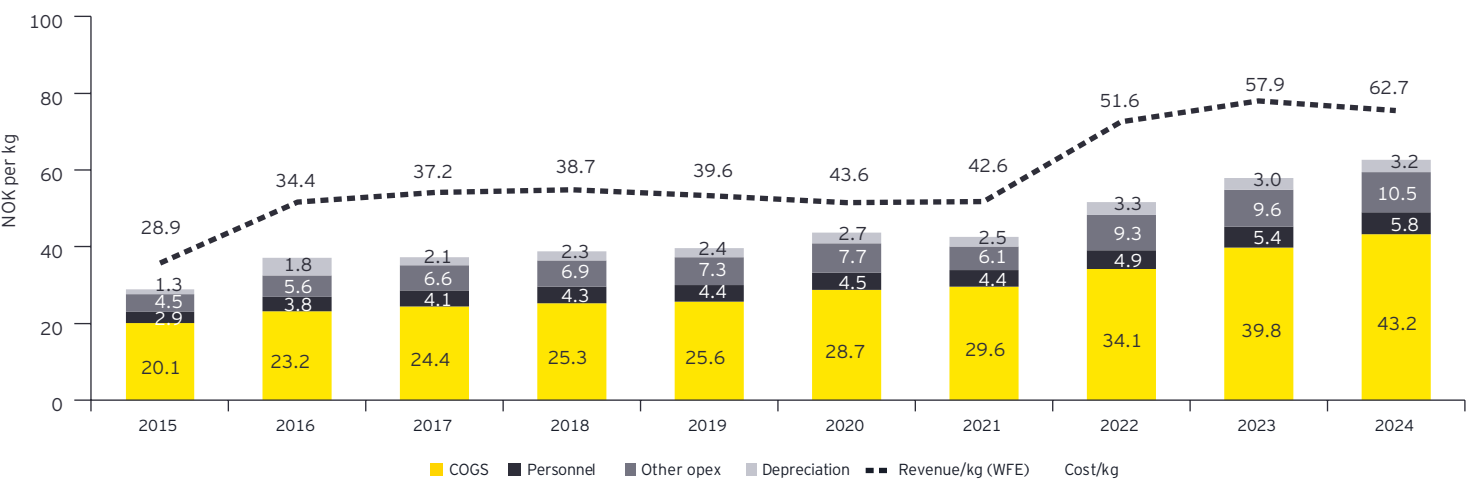


As noted in last year’s edition, we have adjusted financial figures for the sea farming subsegment to enhance comparability with prior years, reflecting the establishment of “pure play” production companies that procure equipment and services from related parties. While this approach is a simplification, we believe the adjusted figures provide a more reliable basis for analysis than unadjusted figures, given the volume of intercompany transactions. Our adjusted figures indicate a decline in EBITDA margins for fish farmers in 2024, from 29% in 2023 to 21% in 2024. While the Fish Pool salmon prices were relatively similar in 2023 and 2024, the achieved price for the sea farming subsegment is slightly lower according to our figures. Combined with the increased production cost (approximately 8.5% in our analysis), this led to an almost NOK 11b EBITDA reduction in 2024 compared to 2023.

Price and volume development



Cost per kg (WFE) development



## Transactions

There have been some notable transactions within the production segment since our last report:

- Cermaq increased their ownership in Ballangen Sjøfarm to a majority stake.
- SalMar increased their ownership in Refsnes Laks to 100%.
- SalMar acquired a controlling stake in Knutshaugfisk.
- Holmøy Havbruk acquired 100% of the shares in Mortenlaks.
- Firda Seafood acquired 51% of Landøy Fiskeoppdrett.
- Mowi increased their ownership in Nova Sea to 95%.
- Wilsgård was merged into SalMar.
- Cermaq acquired Grieg Seafood’s operations in Finnmark (Norway) and Canada
- Alsaker Fjordbruk acquired 100% of the Bolaks Group.

# Distribution

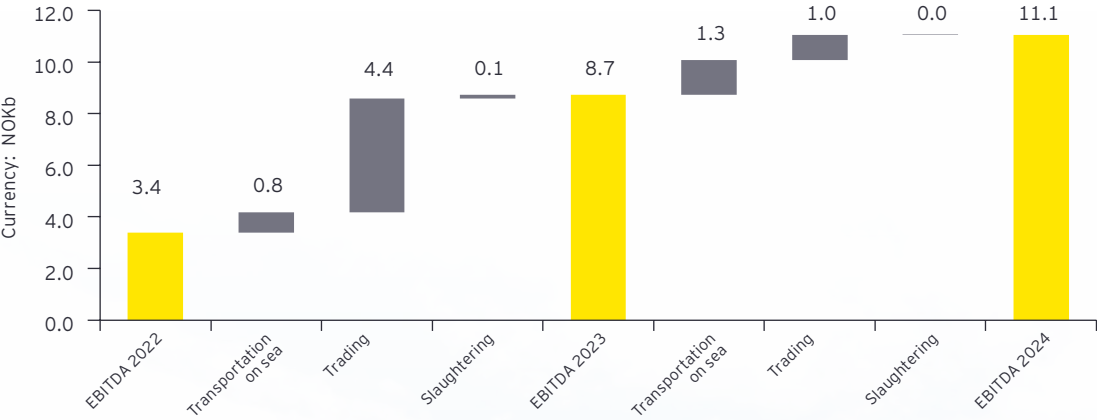
The distribution segment continued its positive EBITDA development in 2024, with both the trading and transportation on sea subsegments delivering EBITDA growth above NOK 1b from 2023 to 2024.

The trading subsegment has reaped positive effects after the introduction of the resource rent tax. In 2023, we observed a large margin increase, with margins for the first time crossing three percentage points. This trend continued in 2024, and we observed an all-time high EBITDA margin of 3.7%. Despite a small volume and annual average salmon price increase, the 2024 revenue for the trading subsegment was relatively on par with the 2023 revenue.

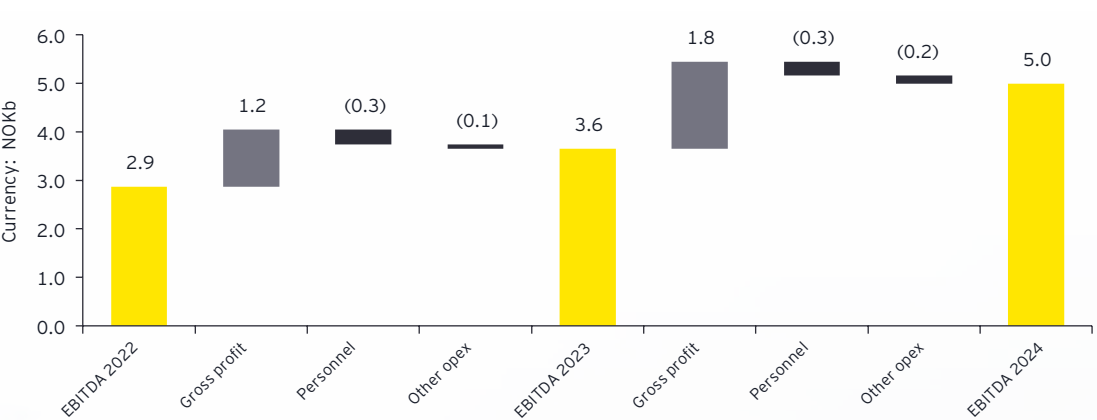
Salmon continues to be a key export sector for Norway, and in both 2023 and 2024, Norway exported salmon for approximately NOK122b-NOK123b, of which the majority was sold to Europe.

Transportation on sea has been a high-growth, high-margin subsegment over the last 10 years, and the 2024 figures expand on this tale. ROCE increased to 11%, the highest level we have seen since 2018. This subsegment primarily consists of well-boats and isolating these companies, we observe an all-time high EBITDA margin of 48% in 2024. Given the relatively stable volume of salmon, it is quite clear that it is not transportation of fish that is the key driver of growth in this subsegment, rather it is the continued biological challenges where the well-boat operators hold a critical role in treatment.

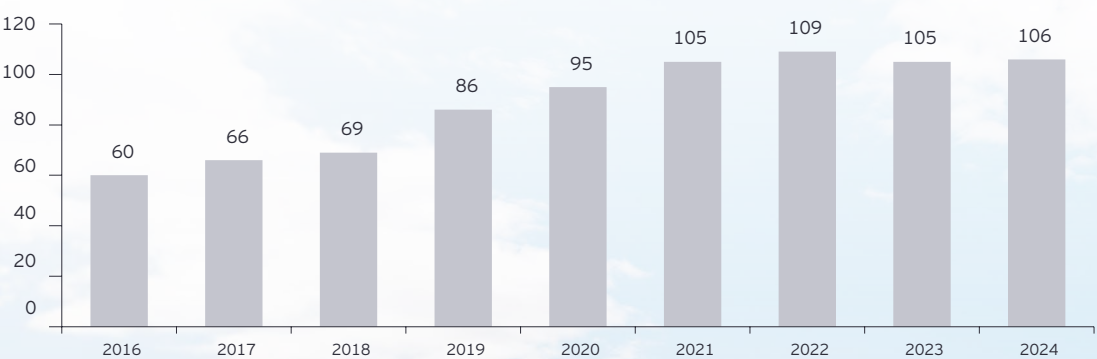
Segment EBITDA bridge



Transportation on sea EBITDA bridge

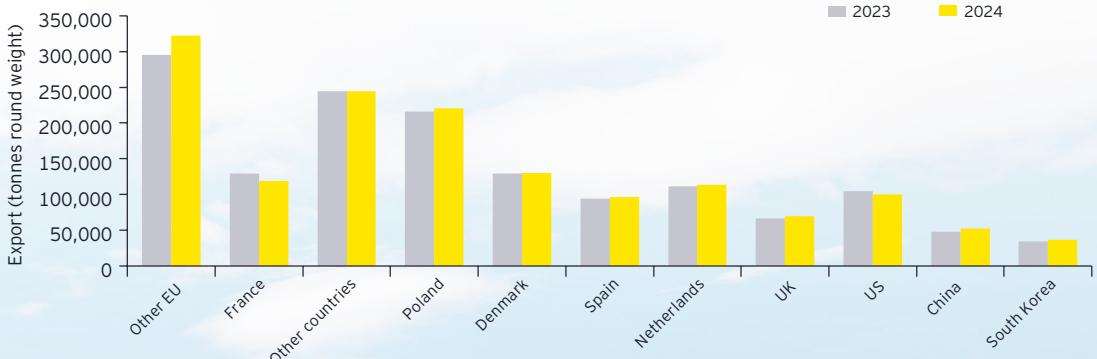


Number of well-boats in Norway



Source: Directorate of fisheries, Kystrederiene

Norwegian export of salmon



Source: Directorate of fisheries



# The Norwegian Aquaculture Analysis turns 10: Looking back and looking ahead

As we mark the 10-year anniversary, we take this opportunity to highlight key developments in Norwegian aquaculture over the past decade and share perspectives on the years ahead.

The economic performance of Norwegian aquaculture during this period has been robust, outpacing inflation by a factor of five. We take a closer look at the key growth drivers and how the different value chain segments have contributed to the topline and EBITDA growth. We then explore how industry consolidation has left its mark on this decade, contributing to the increasing professionalization of the sector.

Other key aspects that have influenced aquaculture in the last 10 years include the changes in production technology, the shift from operations driven mainly by experience to more data and insight-driven farming, and some important regulatory milestones.

Finally, we take a brief look into the crystal ball. After reflecting on the past decade, we now lift our gaze and share what we think the next 10 years might bring, with input from discussions with key industry stakeholders.

## Industry revenues have grown nearly threefold since 2015

The Norwegian aquaculture industry has experienced substantial growth over the past decade, with revenues increasing by approximately 175%. Note that we present all figures in nominal amounts; no adjustments have been made for historical inflation. According to Statistics Norway, the general CPI for the 2014-2024 period was ~34%, indicating that all subsegments achieved real growth during this 10-year period.

While the largest subsegments (feed, sea farming and trading) are the primary drivers of growth in nominal terms, focusing solely on absolute figures only tell part of the story. When assessing

growth in percentage terms rather than nominal amounts, the transportation on sea subsegment emerges as the clear leader, with growth of approximately 300%. Conversely, the yard subsegment shows the weakest percentage growth performance, and this is a subsegment that has had nominal revenues fluctuating between NOK 2.6b (2015) and NOK 4.3b (2022) throughout the historical period.

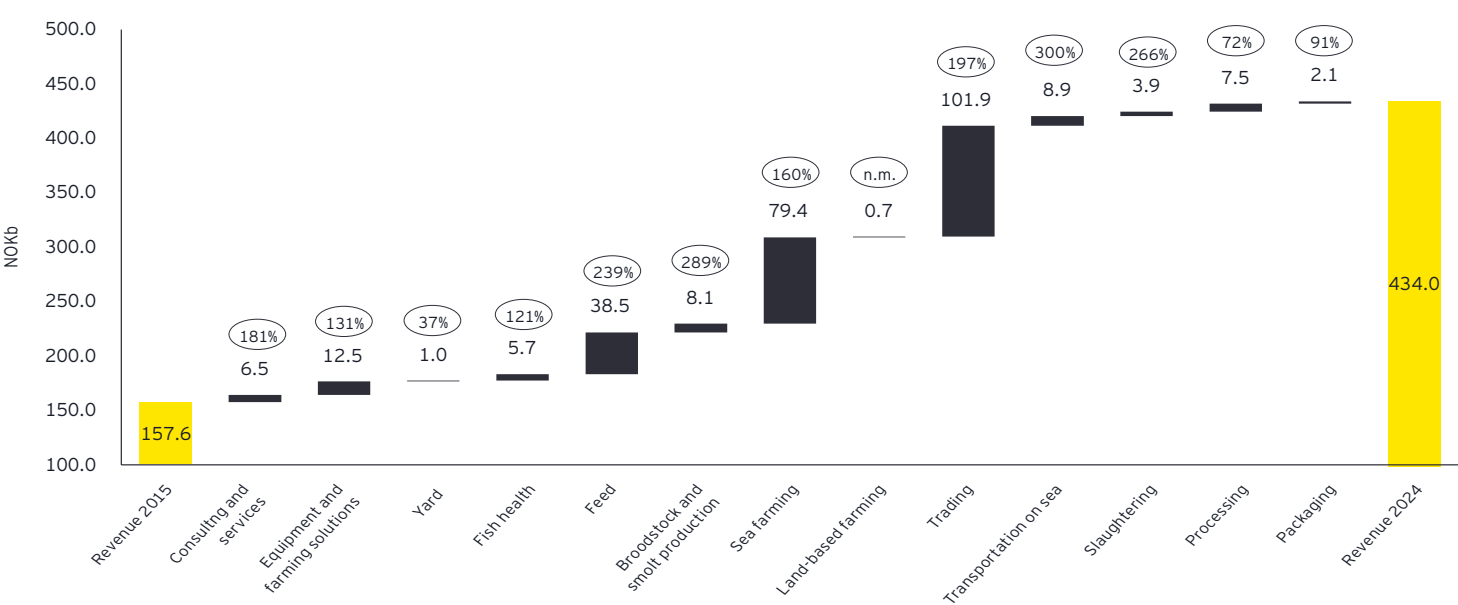
Overall, the graphical illustration reflects an industry that has expanded significantly over the last decade. Growth has not been driven solely by salmon volumes and prices, though these factors have been key contributors fueling growth across the sector.

## Production trends, margin dynamics and biological challenges

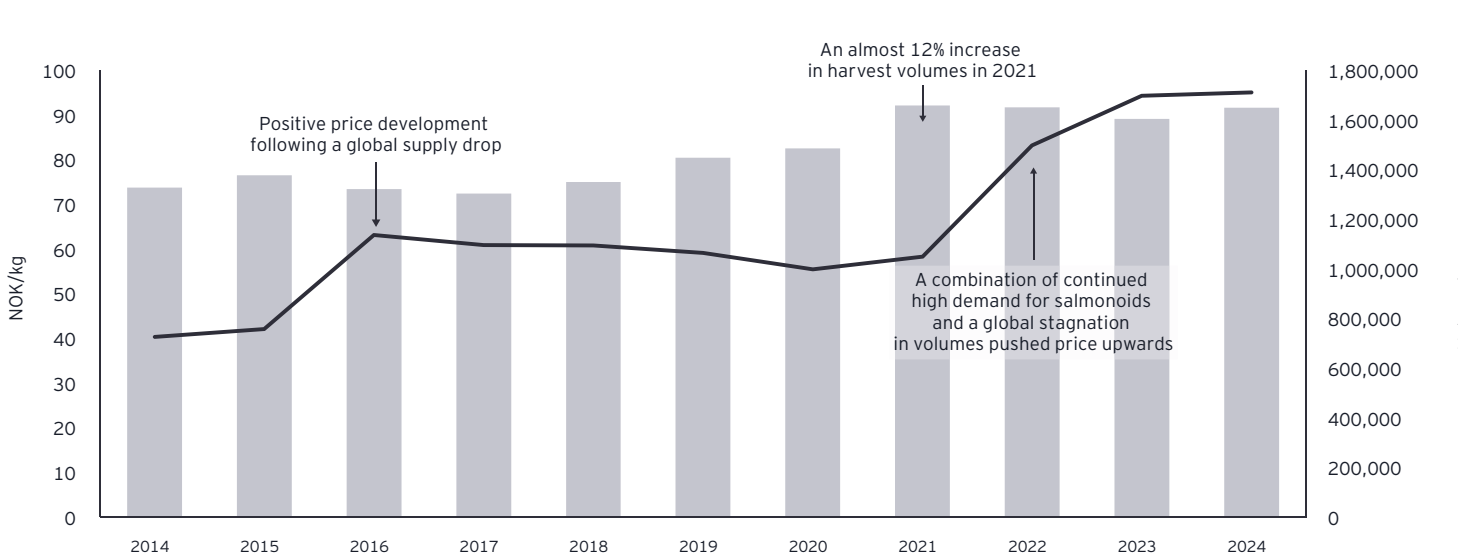
Since 2015, Norwegian farming volumes of salmonoids have increased by 20%, from approximately 1,376k tonnes to 1,649k tonnes – a relatively modest development compared to the 47% growth recorded in the 2009-2015 period. Limited volume growth has supported price increases, with prices rising by 126% over the same 10-year period (2015-2024), according to Fish Pool. The combination of volume and price has naturally been the key driver of growth for the salmonoid traders as well, with the addition of a positive margin development following the introduction of the resource rent tax.

Despite the significant increase in salmon prices, EBITDA margins in the sea farming subsegment have not improved when comparing 2015 to 2024; margins remain broadly similar at 22%-23%. However, margins have fluctuated considerably during the period, peaking at approximately 37% in 2016 and falling to a low of 21% in 2020. This volatility is driven by both salmon price movements and production costs, the latter having increased well above general inflation, with an estimated cost increase of around 120% over the last decade (based on our simplified calculation).

Ten-year revenue change per subsegment



Salmon price (Fish Pool) and harvest volume development



The production cost increase for the farmers must be seen in context with the biological challenges that have had a notable impact on the industry. Issues related to sea lice, disease, and wildlife such as algae and jellyfish have all affected farming volumes. Persistent sea lice pressure led to the implementation of the traffic light system in Norway, which regulates the maximum allowed biomass at farming sites based on regional classification into red, yellow or green zones.

Fish mortality for salmon has remained relatively stable when measured in percentage throughout the last decade, as illustrated in the graphics. In fact, if we treat the highest and lowest year as “outliers”, fish mortality has been stable between 15% and 16%. While certain years have mortality incidents that could be labeled as somewhat extraordinary, for instance, 8m dead fish in 2019 due to algae, the number of dead fish in the following years was still relatively similar. The industry has been the center of public scrutiny for some time and still struggles with its public image, which is understandable given that the mortality level has not improved. Industry voices have been more reactive than proactive in their communication with stakeholders, highlighting a key area of improvement going forward.

But one party’s loss is another’s gain; while sea farmers have faced rising production costs and margin pressure, many supporting subsegments have thrived in the wake of these challenges.

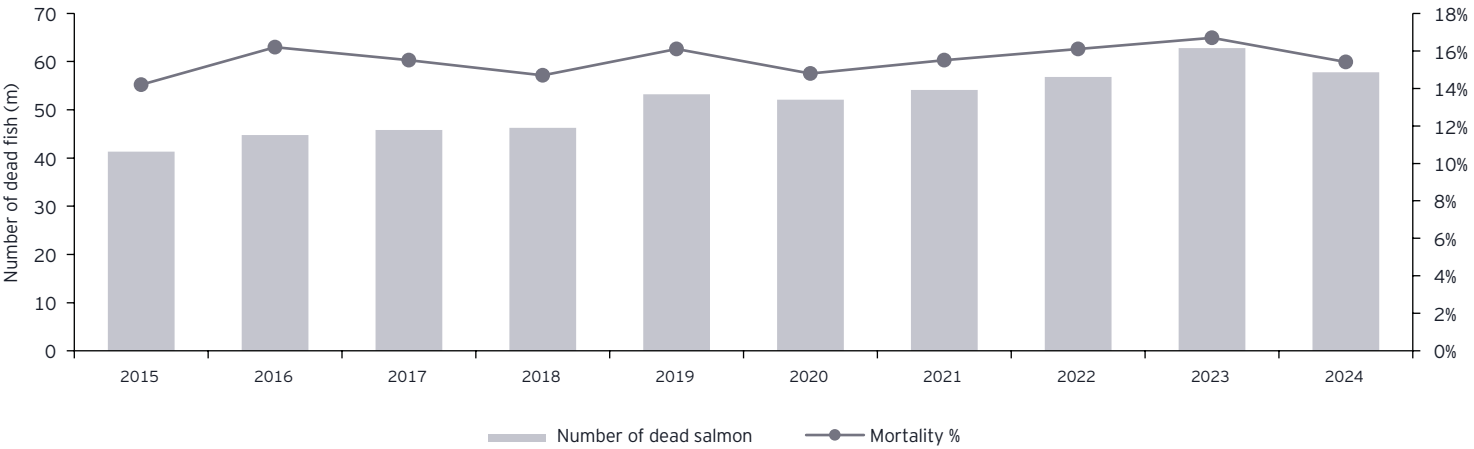
High growth and margin gains in consulting and services

The consulting and services subsegment has delivered strong margin improvements alongside robust growth. This fragmented subsegment comprises a wide range of companies, and the composition of this subsegment has evolved along with the technological development. R&D-focused sea farmers and service vessel providers have been key to the subsegment throughout all this time, but we see an emerging grouping of companies working with themes such as cleaning robots, net pen camera systems, analytics and AI solutions, making up a larger part of this subsegment. Service vessel companies accounted for approximately 20% of this subsegment in 2015, increasing to around 30% by 2024. This represents revenue growth of roughly 320%, achieved in combination with an EBITDA margin improvement of nearly nine percentage points. These companies offer a broad spectrum of services to sea farmers and remain in high demand.

Margin pressure in equipment and farming solutions

While the margin trend within the equipment and farming solutions subsegment has shown a positive trajectory since its low point in 2022, growth over the last decade has not been achieved without pressure on margins. Despite these companies being critical to sea farming operations – supplying essential solutions for both land-based and sea-based production – competition within the subsegment and sea farmers’ limited willingness to pay continue to restrict margin expansion.

Number of dead fish and fish mortality (%) 2015-23



Fish health growth and shifting trends

With prevailing biological challenges, the fish health subsegment has experienced a positive wave, driving both revenue and profitability. Companies in this subsegment provide a wide range of services, but key areas for the largest players include vaccines, genetics and egg production – all of which have taken part in the positive revenue and margin development throughout the decade.

However, this subsegment has also seen trends come and go, such as the use of cleaner fish. In 2015, our dataset shows cleaner fish companies with a combined topline of NOK 270m and an EBITDA margin of 36%. Margins remained in the 30s until 2018, but a downward trend began in 2019. In 2020, revenues declined by 16%, and a negative spiral began. From an all-time high of nearly NOK 1b in 2019, topline has fallen to below NOK 400m in 2024, with a corresponding EBITDA margin of approximately 10%. The decline of cleaner fish is linked to high mortality rates and a negative public perception of them as a “use-and-dispose” solution. This was reinforced by a period of intense negative press attention on their use and high mortality rates in farming operations.

Feed subsegment shaped by raw material price volatility

The feed subsegment reported a revenue increase of 230% based on the raw data in our dataset; however, due to a change in EWOS’s financial reporting period, the 2015 figures should be adjusted on a pro rata basis for comparability. After adjustment, growth for the 2015-2024 period is approximately 150%. This subsegment is highly sensitive to raw material prices, and margin

fluctuations are often driven by changes in raw material costs and timing differences between procurement and subsequent price adjustments to farmers. Fish meal and fish oil are key inputs in fish feed, and their prices are volatile due to the quota system for fisheries. In 2022 and 2023, feed producers experienced a significant revenue increase, largely attributable to a surge in fish oil prices following Peru’s cancellation of the first anchovy season in 2023.

Well-boat demand drives segment performance

As previously noted, the absolute growth leader over the past decade has been the transportation on sea, primarily driven by strong demand for well-boat services. Well-boats have become an integral part of farming operations, playing a critical role in the treatment of fish. These vessels have grown significantly in size compared to a decade ago, which has enabled them to treat larger fish volumes at the farming sites. Well-boat operators have maintained consistently high EBITDA margins, and ROCE has averaged above 10%, even as operators invested in multiple newbuilds during the period.

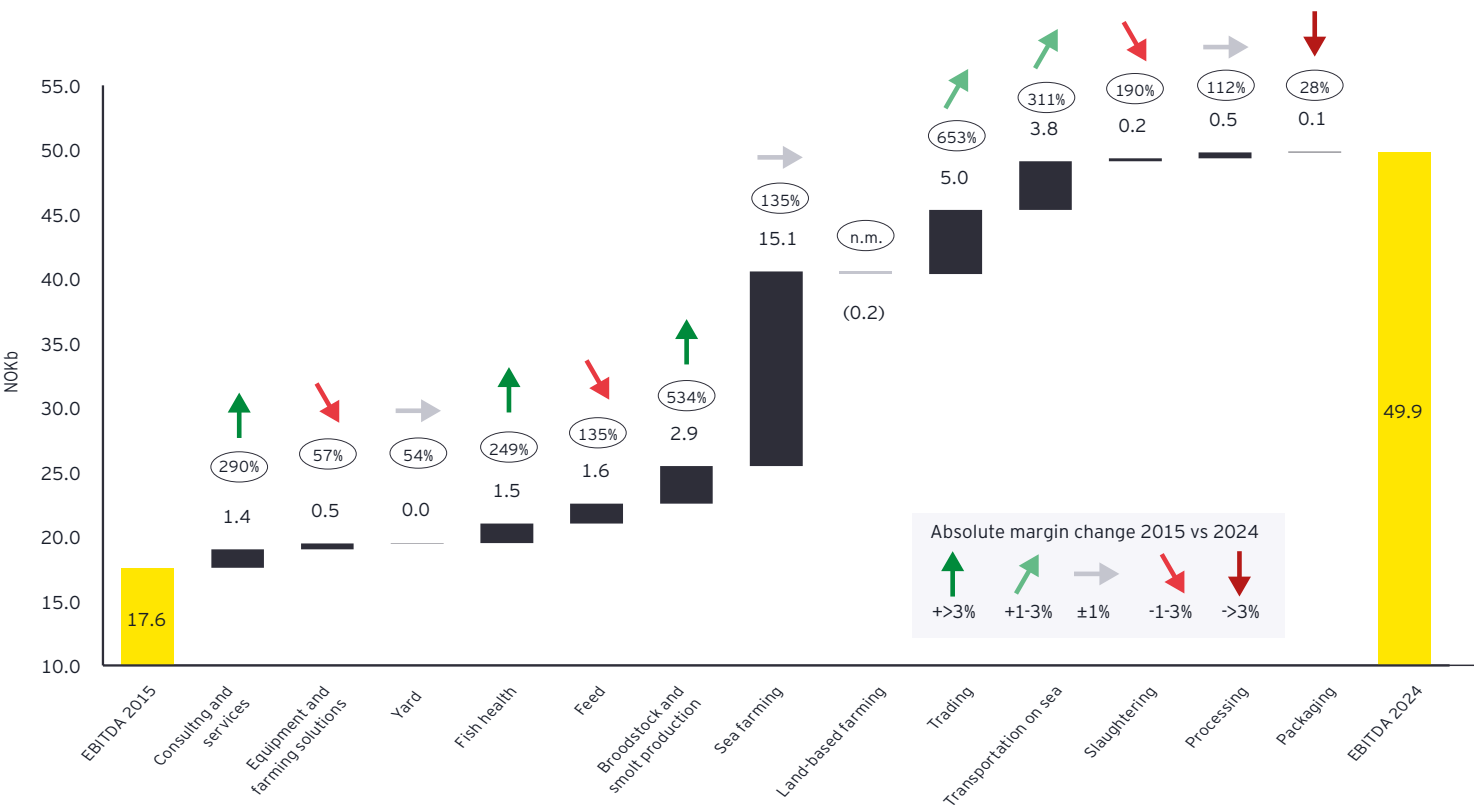
Another notable trend in this subsegment is the emergence of processing and harvesting vessels. These vessels are smaller than modern well-boats, and they can slaughter fish during transit to land. They are also deployed for emergency slaughtering at farming sites when required. EBITDA margins for processing vessels have remained strong, averaging around 50% over the past three years. With more slaughtering plants equipped to handle fish from these vessels, demand for this type of solution is expected to remain robust going forward.

Concluding remarks

The past decade has shown strong growth in the Norwegian aquaculture industry, but the drivers behind this expansion are varied. While overall revenues have increased significantly, the picture is more nuanced; moderate volume growth, price volatility and rising production costs have shaped the performance of the farming operations. Subsegments such as transportation on sea, fish health and consulting and services have successfully

navigated this challenging landscape, benefiting from structural changes and high demand, while others, like cleaner fish providers, have faced steep declines. Margin pressure remains a challenge for sea farmers, reinforcing the need for cost efficiency and innovation. Looking ahead, continued investment in technology, fish health solutions and operational improvements will be key to sustaining profitability and addressing ongoing biological and regulatory challenges.

Ten-year EBITDA change per subsegment



# The role of M&A and consolidation in industry development

Aquaculture is no exception to the trend seen in other industries – consolidation has accelerated as the sector has matured from a young and fragmented industry to a more professionalized one. Strong and consistent macro drivers that attract investor interest have brought capital and focus from financial investors such as private equity and infrastructure funds, which in combination with strategic buyers have fueled acquisitions and consolidation over the past decade.

Across the entire sector, we have identified 259 transactions in the last five years, of which almost half have been in the technical solutions segment. While the list may not capture every deal, it provides a solid indication of the overall activity level.

- Some segments and subsegments have seen more M&A and consolidation than others:
- Technical solutions
  - Transportation on sea
  - Fish health
  - Fish farming

## Technical solutions

This segment has attracted significant M&A activity over the past decade, with consolidation among, e.g., equipment and service vessel providers, multiple net-cleaning solution (robotic and autonomous) transactions, camera-driven analytics platforms and various lice treatment technologies.

This segment has historically consisted – and still largely consists – of many small and medium-sized companies, often privately owned and entrepreneur-driven. Along the Norwegian coast, numerous innovators have developed solutions within equipment and farming technology and more recently within software and services.

Larger equipment providers such as Akva Group and ScaleAQ have grown through M&A over the past decade, but this subsegment still holds significant consolidation potential. Limited biological exposure and relatively stable margins have attracted interest from both Norwegian and international financial investors, although many struggle to find a sufficiently large platform investment. Recent years have also seen increased margin volatility due to resource rent tax, inflation and supply chain challenges. The increasing technology dependency in the industry will call for larger supplier constellations with more stable and profitable returns on investments that aim to solve the biological challenges the industry is facing. The merger between Vónin Aquaculture, Mørenot Aquaculture and FiiZK Protection to form ELDI Group is a recent example of this.

A notable trend within consulting and services is the shift toward “product-as-a-service” models, where companies lease equipment – typically bundled with software and analytics – rather than acquiring standalone “single-purpose” products. Recent acquisitions by major international players such as Stingray Marine Solutions (Novo Nordisk), Optoscale (Insight Partners) and Aquabyte (Vitruvian Partners) signal strong future confidence in these business models within AI-driven monitoring, lice control and automated feeding.

## Service vessels and transportation on sea

Revenue growth, attractive margins and substantial equity tickets in the transportation on sea subsegment have resulted in high M&A attention from especially infrastructure funds.

Sølvtrans, the dominant player, got Antin Infrastructure Partners on board in 2018 and, alongside a major newbuild program, has grown through acquisitions of Bømlø Brønnbåtservice and Dess Aquaculture Shipping. Intership and Aquaship were acquired by

AIP and now form part of Trident Aqua Services together with FSV Group. The harvest vessel company, Napier, was sold to yet another foreign financial buyer, CapMan Infra.

After the number of available targets in the sector has diminished, the focus has shifted to the service vessels. Service vessels typically have shorter fixed contracts and have on average generated lower EBITDA margins than transportation on sea subsegment (10-year average of approximately 25% compared to around 40%). Despite this, the buyer landscape is dominated by major international infrastructure funds, including the acquisition of Frøy (Goldman Sachs), Aquaship and FSV Group (American Industrial Partners (AIP)), AQS (Marguerite) and Abyss (Arcus Infrastructure). Abyss later acquired Frøy’s smaller service vessels. Several ongoing processes suggest that the consolidation continues.

## Fish health

The fish health subsegment has enjoyed strong revenue growth and margins driven by biological challenges in the industry. Combined with a fragmented landscape of smaller players, this has fueled consolidation. Benchmark Holdings initially expanded through acquisitions (including Salmobreed and Stofnfiskur) before going public, later selling Benchmark Genetics to Novo Nordisk in 2024 and delisting. Norwegian private equity funds have invested in several smaller fish health companies such as Cryogenetics (Bluefront) and Aqua Kompetanse (Bluefront), while Summa Equity acquired Stim. DNV also made a significant move into fish health through its acquisition of Åkerblå Group.



Fish farming

Until 2013, no company could own or control more than 25% of the production capacity in Norwegian aquaculture. After this restriction was lifted, several major players have grown even larger through M&A, including Mowi, SalMar, and most recently Cermaq.

A comparison of the Aquaculture Register from 2015 to 2025 reveals a clear consolidation trend. The number of companies that hold commercial production licenses has decreased by almost 17% in the period and if we had summarized it on group level the decrease may be even higher. At the same time, the number of licenses has increased by more than 18%, resulting in an average increase in license per company from 8.4 in 2015 to 11.9 in 2025.

- There have been several landmark transactions in recent years that have strengthened the largest players:
- Cermaq’s acquisition of Grieg Seafood Finnmark (and Canada, 2025)
  - Mowi’s increase from 49% to 95% ownership in Nova Sea (2025) and acquisition of K. Strømmen Fiskeoppdrett (2019)
  - SalMar’s consolidation of NTS, including Norway Royal Salmon and Salmonor (2022)

- Further consolidation among smaller privately owned players has also occurred, such as:
- Alsaker Fjordbruk acquiring Bolaks
  - Firda Seafood acquiring a 51% stake in Landøy Fiskeoppdrett
  - Troland Lakseoppdrett andTelavåg Fiskeoppdrett acquiring 60% of Engesund Fiskeoppdrett
  - Tombre Fiskeanlegg, Lingalaks and Eidesvik Laks acquiring Norway Royal Salmon Region South

Further transactions involving family-owned Norwegian aquaculture companies are currently in the pipeline. The question is whether some SMB players can seize these opportunities to grow or whether the largest players will pick them up and widen the gap even further. The irreversible fact is that this ongoing shift towards larger, more integrated operators, is driven by rising investment needs, regulatory complexity, and the advantages of scale.

Outlook

Despite much M&A activity in recent years, Norwegian aquaculture is still a young and fragmented industry, and we expect the consolidation trend to continue across the value chain in coming years.

As supported throughout our analysis, the value creation and capture is still largely concentrated in the production segment. We believe that as the industry gradually becomes more technology dependent throughout the production cycle, this will call for an improved “power balance” between suppliers and fish farmers, implying a more consolidated supplier industry with larger, more industrialized and financially stronger entities.

A key point of interest is the extent to which consolidation will be driven by strategic versus financial investors, and whether financial investors will increasingly take on more biological exposure and enter the fish farming segment. At the EY organization, we regularly engage with Norwegian and international investors who are interested in gaining a foothold in the aquaculture sector. We observe broad interest and several players – both financial and industrial – who are increasingly open to taking an ownership position in fish farming, also in the form of a minority stake.

Seen with Norwegian lenses, the increasing involvement of foreign investors in Norwegian aquaculture – particularly in high-value transactions – raises important questions about long-term industry ownership and strategic direction. While international capital can bring new expertise and market access, it also prompts a debate about maintaining national control over key natural resources. The outcome will depend on how Norwegian companies and policymakers balance openness to investment with the desire to safeguard local value creation and industry leadership.



# A brief look back in time

Let us now look at the bigger picture of Norwegian aquaculture and highlight some of the events that have shaped the industry over the past decade. We focus on economic development, the evolution of production technology, the growing role of data and insights, and the regulatory changes that continue to influence the sector.

|      | Economy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Production technology                                                                                                                                                                                                                                                                                                                                                                                                                            | Data and insights                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Regulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2015 | There is continued volume growth and high export values, but increasing biological and regulatory pressure, such as sea lice, mortalities and local environmental impacts, drive up costs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Closed and semi-closed systems are widely explored as potential alternatives. While several pilot projects with closed sea cages have emerged, implementation remains small scale, and open cages continue to dominate.                                                                                                                                                                                                                          | A new layer of data- and insight-driven technology emerges. Companies like OptoScale (established in 2015) and Aquabyte (2017) use sensors, machine vision and data analytics to monitor biomass, welfare and performance, while AquaCloud (launched in 2017 by NCE Seafood Innovation) provides a big data platform for sharing and analyzing production data across the industry. In 2019, Aquabio (later renamed Waive) is established to develop advanced sonar- and data-driven solutions for aquaculture and fisheries, underscoring how digital insight and data infrastructure become increasingly central to the salmon farming mode.                                                                                                                                                                                                                                                              | The traffic light system (2017) was introduced, linking capacity growth to lice-related risk and results. Green zones are awarded growth opportunities through auctions, yellow zones are kept at the same capacity as before and red zones face mandatory reductions in the maximum allowed biomass (MAB).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2020 | <p>In 2020, the COVID-19 pandemic hit Norway hard, but the aquaculture sector came through relatively well. Salmon prices stayed roughly unchanged from 2019, before rising sharply in 2021. Demand shifted, with lower sales to hotels, restaurants and catering and higher sales through retail as people ate more at home. Over time, this had a positive effect, as more consumers in international markets became used to eating salmon at home.</p> <p>From 2021 to 2023, record salmon prices, a weak krone and limited supply give very high revenues, even though feed, energy and labor costs rise sharply.</p> <p>From 2023, a new resource tax starts to pull profitability and investment down.</p> | Production technology is diversifying, with continued investment in traditional open cages alongside semi-closed and closed systems at sea, land-based RAS and submersible concepts. Many of these concepts, especially submersible and fully closed systems, remain technically demanding because keeping fish deep in the water column with enough light, oxygen and reliable monitoring has proven more challenging and costly than expected. | <p>With the data-driven shift, salmon farming increasingly relies on sensors, models and cloud platforms, with new players like AquaPredict (2023) and Oceanbox.io (2021). Since the launch of ChatGPT (Nov 2022), willingness to invest in AI has increased across industries, including aquaculture, where farmers are starting to move from experience-based decisions to predictive models that improve growth, welfare and operations.</p> <p>A growing number are testing machine learning and AI to automate parts of feeding, environmental control and planning, using models not only to monitor but also to predict and optimize biological and operational outcomes. The transition is still far from complete, and practices differ widely across the industry, with some operators piloting AI-driven automation while others continue to run key processes in simple Excel spreadsheets.</p> | <p><b>The development of special permits (Development Licenses Scheme)</b> allowed companies to acquire new license capacity, under certain conditions, if they invested in innovative technology (e.g., offshore cages, closed systems) that addresses environmental or area challenges and that the entire industry could benefit from.</p> <p>The NYTEK (Regulations on requirements for technical standards for aquaculture facilities) for land farms introduces minimum engineering standards for onshore facilities – covering tank design, barriers and water treatment – to prevent escapes and ensure environmental safety. It mirrors the existing NYTEK standard for sea cages, applying similar rigor to land-based systems.</p> <p>The updated NYTEK23 (2023) requires all farms to use certified equipment and maintain an engineering certificate, with regular site surveys, to minimize escapes. It applies to marine and freshwater farms.</p> <p>The resource rent tax (2023) is a 25% tax on profits from salmon, trout and rainbow trout farming, added to corporate tax (22%). Tax revenues are split between state and municipalities.</p> |
| 2025 | In 2024-2025, high costs, taxation and lower salmon prices squeeze margins, and overall profitability falls.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | In 2025, we see that several major farmers are no longer just piloting new production technology. They are rolling it out at scale across their operations, investing heavily in semi-closed cages and larger post-smolt units.                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>The long-awaited Government Aquaculture white paper, suggesting a new regulatory framework for the industry, was put forward in April 2025, suggesting, e.g., to end the traffic light system, remove the MAB limitations, introduce tax on lost fish and implement a sea lice quota system. Quickly after, a broad coalition of the political parties in the Norwegian Parliament, including the government, mutually agreed that the consequences of the proposals would be further assessed and discussed in 2026 before a final decision is made.</p> <p>In October 2025, the government put forward a new Environmental Technology Scheme that in short will allow fish farmers in red zones to reclaim reduced production capacity if they produce with closed containment, reducing the environmental impact in their production area.</p>                                                                                                                                                                                                                                                                                                               |

# How regulation has shaped Norwegian aquaculture

As shown in the timeline, Norwegian aquaculture has undergone consequential regulatory changes the past 10 years. These reforms have reshaped operating models, investment decisions and competitive dynamics, while signaling a durable policy focus on sustainability. What role do these evolving regulations play in moving the industry from a period of rapid expansion to one defined by risk management, environmental stewardship and operational excellence?

## From growth to guardrails

In the early 2010s, expansion was rapid. Regulation primarily centered on licensing, environmental protection and disease control, with the Directorate of Fisheries setting who could farm and how much could be produced. The introduction of development licenses aimed to catalyze solutions to environmental constraints – such as closed and offshore farming – by lowering the barrier to experimentation while raising the bar for scale-up. This framework opened space for innovation but simultaneously increased the cost and capability thresholds for new entrants, as firms invested heavily in R&D to qualify given the potential to gain highly attractive license capacity uplifts as a result.

## The traffic light system

To better protect the environment, Norway implemented the traffic light system, linking production capacity to measurable indicators – most notably sea lice pressure – at the production area level. The mechanism has moderated growth in some regions while intensifying operational focus on fish health, preventive control measures and local ecosystem impacts.

With this new system, growth opportunities became uneven. Sites in “red” zones faced mandatory reductions in their maximum allowed biomass. Operators in “green” zones, by contrast, benefited from expansion opportunities, reinforcing regional differentiation in competitiveness and capital allocation and making execution on biology and compliance a competitive advantage.

## The resource rent tax

Introduced in 2023, the resource rent tax (Norwegian: grunnrenteskatt) targets the extranormal returns accruing to sea-based farming of salmon, trout and rainbow trout. Following extensive consultation, the rate was set at 25% (down from an initial 40% proposal), applied to the sea phase only, with a tax-free allowance to shield smaller fish farmers.

The tax prompted restructuring – notably ring-fencing sea-phase entities – while increasing administrative complexity. Investment decisions, particularly in new technology and land-based projects, were deferred pending regulatory clarity. The intended fairer distribution of value has, in practice, come with higher planning uncertainty and reprioritization of capex.

## Sustainability and circularity

Other policy instruments than pure regulations increasingly emphasize environmental performance across the production lifecycle. Political aquaculture strategies, new standards and incentives, e.g., promote waste management, plastics recovery and sustainable feed ingredients, potentially raising both compliance requirements and operating costs. At the same time, market positioning increasingly values credible sustainability performance and transparent reporting.

Therefore, the industry is preparing for stricter EU-aligned climate and environmental disclosure, reinforcing the role of data quality, traceability and auditability.

## Land-based and offshore farming

With stricter controls on traditional sea-based operations, investment interest grew in land-based RAS and offshore or exposed site solutions. However, the regulatory framework for these modalities is still evolving. In recent years, temporary pauses on new applications – particularly for land-based projects – have been introduced while rules are refined to address biosecurity, environmental footprint and systemic risk. At the same time, offshore farming remains largely unregulated, creating uncertainty around operational requirements and compliance standards. It is also unclear whether offshore production will be subject to the resource rent tax – a question that has effectively halted most ongoing offshore initiatives until clarity is provided.

The strategic consequence is that these pauses and evolving standards have tempered near-term capacity bets and reinforced a sequenced approach: de-risk concepts, align with forthcoming rules, and prove biology and economics at pilot scale before deployment.

Taken together, the decade marks a progression from expansion-led policy to risk-managed growth, guided by measurable environmental outcomes, fiscal sharing and verifiable sustainability.

## Looking ahead

The last decade reveals a clear regulatory arc: Norwegian aquaculture policy has moved from enabling growth to actively managing risks, sharing resource value, and driving sustainability and transparency. This shift has made the sector more resilient and accountable, yet also more complex and costly in governance, compliance and capital planning.

The industry currently finds itself at a juncture where innovation must be compatible with environmental stewardship and societal returns.

We expect that going forward there are two key proposals that will shape the regulatory landscape. First, the Government’s Aquaculture white paper (Havbruksmeldingen), presented in April 2025, proposed major reforms such as replacing biomass limits with environmental quotas and merging site and company licenses. Although the proposal was later put on hold by a broad parliamentary coalition, negotiations continue, and a comprehensive agreement is expected in 2026. Second, the Environmental Flexibility Scheme (Miljøfleksibilitetsordningen), introduced in October 2025, adds a new layer of flexibility by allowing companies to adjust production within strict environmental parameters. This scheme signals a shift toward performance-based regulation, rewarding operators who can demonstrate strong environmental outcomes.

# Perspectives on the next decade

In a period with rapid innovation and change, history alone is not enough to tell us what comes next. We have therefore spoken with important stakeholders in the industry to better understand what may lie ahead. Here are six trends we believe will shape Norwegian aquaculture in the coming decade.

## 1 Production technology – a new era

We have transitioned from traditional open-net pens at sea to a diversified mix of production technologies, a shift that remains in its early stages. Post-smolt sizes are steadily increasing, with more fish retained at land or in closed systems at sea until they reach around 1 to 1.5 kilos before transfer to sea for the final grow-out period. We expect co-located hybrid sites to become the norm where feasible, integrating land-based smolt facilities, closed containment at sea and open cages at a single location to minimize handling, transportation and biological risk. Compared with full grow-out on land and deep submersible cages, both of which have proven technically challenging, these hybrid solutions presumably have lower operational complexity and greater scalability.

## 2 Consolidation continues – also among suppliers

Emerging farming practices, supported by advanced production technology and digital systems, are increasing farmers’ integration with their suppliers. Operating modern farms will require substantial investments in equipment, software and digital infrastructure, reliance on technology for daily operations, and longer-term service and support contracts. In this environment, many farmers are more inclined to commit significant investments to established suppliers with proven track records and financial strength. This dynamic raises barriers for smaller farmers and vendors, driving both toward mergers, partnerships and consolidation among farmers and suppliers.

Climate change and volatile sea conditions make it riskier to be dependent on a limited number of farming sites at the same region or in the same fjords. Temperature shifts, algae blooms and other events can disrupt production. This aspect may also continue to drive consolidation in the production segment.

There is a wave of AI-driven innovation across the economy, and aquaculture is no exception. A growing number of startups are developing data, software and machine learning solutions for the industry. As these solutions further develop and are increasingly adapted by the farming industry, we can expect acquisitions and mergers with startups being adopted by larger industrial and financial owners, gradually turning today’s fragmented landscape into a more consolidated landscape of technology suppliers.

## 3 Automation and AI – the next leap

Over the next few years, fish farming will progress beyond using data for reporting toward fully automated, model-based operations. Routine operations related to feeding, depth and light control, lice management, fish health monitoring and planning will increasingly be handled by systems that sense, govern and act with minimal manual input.

People will focus on deviations and system improvement, while new roles emerge: data engineers, analysts and domain experts who translate biology into algorithms. Success will require a digital lean mindset, redesigning processes so automation does not just monitor and display data as the basis for decision – it executes them.

The cost of joining this race is high, but the gains are clear: lower mortality, better resource use and stronger resilience. For those who master this shift, the payoff will be long-term competitiveness and sustainability.

4

The future of circular feed

Circularity in aquaculture is in its early stage and is set to accelerate. Historically, feed has relied on fishmeal and fish oil from wild fisheries as main ingredients, a source of protein that is not infinitely scalable. To support continued growth and to reduce ecological impact from existing feed value chains, the sector is exploring and investing into alternative feed ingredients that are more sustainable and circular. These include insect-based protein meals, microalgae and kelp, fermented microbial proteins, and other novel sources.

Hurdalsplattformen (the Norwegian government’s national priorities) has set clear targets to increase the share of Norwegian origin feed ingredients to 25% by 2034 and to ensure that all feed in Norwegian aquaculture comes from sustainable sources. In addition to these national goals, major feed producers have communicated their own sustainability targets, focusing on novel and circular feed ingredients. Despite these targets, the lack of concrete incentives and first mover advantages have slowed the adoption rate of novel ingredients which, at least for now, struggles to compete on cost with existing ingredients.

With forecasted salmon production volumes outpacing the expected supply of, e.g., fishmeal and fish oil, incorporating novel ingredients is not just desirable, it is a necessity for growth. Research and regulatory assessments confirm that novel ingredients can be used safely within set limits, reducing climate footprint without compromising growth or fillet quality. Yet, clear evidence of safety and strong environmental arguments will be the key to winning trust. Alternative feed ingredients, many of which are sourced from marine ecosystems and produced locally, can meet sustainability goals while also aligning with consumer preferences. As such, it is clearly in the industry’s best interest to act sooner rather than later, but who will lead the way?

5

Transparency and trust – data as license to operate

Over the next decade, transparency will shift from a reporting exercise to a core competitive advantage. Regulators, investors, retailers and consumers will expect detailed, up-to-date documentation of fish welfare, including mortality, behavior, fish pen density, handling and lice levels, together with emissions and climate footprint, all backed by auditable data and digital traceability from roe to plate. Companies that use their data to demonstrate consistently high welfare and low impact will strengthen both their license to operate and their reputation, gaining access to the best markets and partners, while those who cannot document their performance will see their image weakened and find it increasingly difficult to compete.

6

Changing financial risk and cost structure

Salmon farming is moving toward a fundamentally different financial risk profile driven by changes in both operating cost structure (opex) and capital expenditure requirements (capex). New capital-intensive production technologies, with more advanced operations, require significantly higher upfront investments. Furthermore, operations characterized by higher fixed operational and financial costs result in a greater proportion of fixed costs and increased capital intensity – ultimately elevating financial risk. At the same time, more solutions are delivered through integrated product or service models, where farmers commit to long-term contracts for technology, software and support rather than making one-off purchases of parts and services.

This transition shifts financial risk from short-term operational variability to long-term capital and contractual commitments. While these models can enhance biological control and operational stability, they also raise the breakeven thresholds and make scale, financial strength and predictability critical. Consequently, profitability will depend not only on biological performance and prices but increasingly on balance sheet strength, access to capital and the ability to manage fixed costs over time. Together with the biological vulnerability farmers with licenses in a limited geographical area face – also a cause for higher operational risk – these are drivers we believe will accelerate the consolidation within the farming industry.

# Production technologies | Status and ongoing initiatives

## Development and recent obstacles

Norway’s salmon farming industry has traditionally relied on open-net pen systems in coastal waters. In these floating pens, ocean water flows freely through the mesh, bringing with it anything that is small enough to get through. This approach is a proven and cost-effective solution, and it allows the salmon to live in a natural and familiar environment.

However, what makes the traditional open solutions great can also be a challenge; sea lice, disease, algae, jellyfish, escape risks, etc., are all threats to the open-net solutions – and any waste from the salmon and salmon-related activities happening inside the net pens will be carried away by the natural currents outside the net pens.

Sea lice have been a prevailing biological issue for the industry for many years, leading to higher operational expenses as well as higher fish mortality. The sea lice issue has no simple solution, and they have proven to be resilient and adaptable. There are national guidelines regulating the amount of sea lice that is allowed within a net pen, and when certain thresholds are exceeded, the fish farmers treat the fish using well-boats. These treatments can be stressful to the fish and can cause higher mortality rates. They also pose a significant cost for the fish farmers. Sea lice are present along the entire Norwegian coast, but certain areas have more issues than others – especially the west coast of Norway.

## Regulations and incentives for innovations

In response to the industry’s challenges , Norwegian authorities have introduced regulations and incentive programs aimed at mitigating negative impacts and fostering technological innovation.

To stimulate innovation, the government launched development licenses from 2015 to 2017, offering special licenses at minimal cost to companies proposing radical new technologies. These

licenses could later be converted into permanent commercial licenses if the projects met their innovation goals. This initiative encouraged experimentation and led to the development of various new farming methods, including offshore structures and closed-containment systems.

Another initiative is the “traffic light” system, implemented in 2017, which divides the coast into 13 production zones rated green, yellow, or red based on environmental indicators, particularly the impact of sea lice on wild salmon migrations. Farms in green zones can increase production by up to 6%, while those in red zones must reduce production by 6% until conditions improve. This system has created a clear regulatory push for solutions that can address lice and other environmental issues.

More recently, in late 2025, Norway introduced the Environmental Flexibility (“Miljøfleks”) scheme, which allows farms that had to scale down due to a red light rating to regain their biomass allowance by adopting approved zero-emission technologies. This means that farmers can recover lost capacity by implementing closed-containment solutions.

Another example is what has taken place in Canada, where the government has set a 2029 deadline to end open-net pen salmon farming in British Columbia (BC). All ocean-based salmon farms in BC must transition to closed containment systems (either land-based or closed pens at sea) by 30 June 2029.

Together, these policies create both pressure and opportunity for salmon farmers to innovate. Companies must now address biological challenges or risk facing production limitations.

Driven by regulatory incentives and potential financial benefits, such as reduced mortality and lower treatment costs, alternative production technologies are emerging and gaining traction. Below

is a brief overview of these alternatives, including examples of solutions already implemented by fish farmers.

## Semi-closed containment

Semi-closed containment systems are a hybrid between open nets and fully closed farms. These are floating enclosures in the sea that have solid or impermeable walls, usually made of rigid plastic or flexible durable fabric (instead of net mesh). Water is pumped into the pen from outside (often from deeper below the surface) to refresh the environment inside. The enclosure typically has an open top at the surface for air exchange, feeding, and access, but the sides and (sometimes, but not always) bottom are sealed to prevent free flow from the ocean. In effect, the fish are kept in a “big bag” of water within the sea.

The goal of semi-closed tech is to reduce interactions between farmed salmon and the external environment while still farming in the sea. By having a physical barrier, these systems keep out sea lice, harmful algae, and jellyfish that can negatively impact open-net farms – water pumped from deep layers is usually free of sea lice larvae and many pathogens. The barrier also prevents fish escapes and can mitigate pollution by collecting waste instead of releasing it into the sea.

This technology is utilized by several farmers, including Cermaq (Certus system from FiiZK), Salmar and Lerøy (Aquatraz from Seafarming Systems), Mowi (FiiZK) and Nordlaks (Hydra Storbåtsegget). While the development has been ongoing for some time, it has not been without challenges. Multiple incidents involving greenfield semi-closed systems have resulted in failure; however, these setbacks have provided valuable insights that have enabled developers to enhance the products.

Our understanding is that semi-closed solutions may qualify for the Environmental Flexibility arrangement, depending on

the degree of closure below the surface. We anticipate broader adoption of this technology going forward.

## Fully closed containment

Closed containment farms keep fish in a completely isolated environment separate from natural waterways. Closed containment at sea involves a rigid structure (like a large closed tank or bag) placed in the ocean but sealed off from it, functioning much like RAS does on land, but in floating form.

These solutions require pumping and treating water but use the surrounding sea as the source and sink after treatment. Whether on land or floating, true closed systems do not allow free exchange between farm water and the environment.

The driving reason for closed containment is to eliminate the negative interactions of open-net farming. Because farm water is contained and managed, sea lice is a non-issue (no lice can enter a closed loop), fish pathogens can be largely kept out (intake water is disinfected or groundwater is used), and waste is fully captured instead of released into the sea, and fish cannot escape. This means closed farms can avoid most environmental impacts on wild ecosystems – they are considered far more sustainable in terms of biodiversity protection.

With the introduction of the Environmental Flexibility arrangement, we anticipate an accelerated pace of adoption and development for this technology. Several projects are classified as fully closed, with farmers such as Hofseth (initially referred to as the “egg,” though the latest iteration no longer retains this shape) and Salmar (Marine Donut from Bluegreen Group) already integrating these solutions into their daily operations.



Production technologies | Status and ongoing initiatives

Submerged pens

Subsea farming refers to keeping fish cages under the surface of the ocean, rather than floating at or near the surface as in conventional farms. In practice, this means using submersible net pens that can be lowered to a certain depth (e.g., 20-30 meters below) and maintained there for extended periods. The cages themselves are usually similar to regular open nets but built to withstand water pressure and keep their shape underwater (often with reinforced frames and a central spar or tension system). Key to submerged farming is solving the issue of fish buoyancy: salmon need to gulp air at the surface to fill their swim bladders and maintain buoyancy. To address this, submersible cage designs incorporate an air dome or air pocket underwater that fish can access.

The main reason to farm fish underwater is to avoid problems that are mainly concentrated at the surface. Sea lice and algae blooms mostly occupy the top layers of water. Sea lice larvae are typically abundant in the upper parts of the water column, so keeping salmon at greater depths lowers the lice infestation risk. Likewise, many harmful algae blooms and jellyfish swarms affect surface waters; by submerging cages, farmers may be able to shield the fish to a greater extent. Submerging can also help in rough sea conditions: during storms, wave action is more violent at the surface than in the depths.

A key question regarding submerged net pens is whether sea lice will follow salmon to deeper depths. Both Lerøy and Salmar have adopted this technology and report a reduced need for delousing operations compared to conventional open-net pen solutions.

Offshore farming

Offshore fish farming refers to moving the sites into the open ocean waters (further from the sheltered coast). This requires very large, robust structures that can withstand strong waves, currents and winds. There are a few types of offshore systems: some are essentially gigantic versions of net pens with steel frames (often semi-submersible), while others are aquaculture vessels or barges that hold fish in tanks or cages.

Nearly all offshore salmon farms are open systems – they use nets and exchange water freely with the ocean. The difference from coastal open nets is physical location, not the fundamental open-net design. So, in terms of enclosure: there is no additional enclosure in offshore cages; fish are in ocean water just as exposed (or more so) than coastal pens.

The push offshore is driven by space and environmental constraints in coastal waters. Traditional farming areas (fjords, bays) are reaching capacity or face user conflicts (with fishing, tourism, etc.). Offshore, there is vast space to produce seafood without competing with near-shore activities. Also, going offshore can reduce environmental impacts locally – the idea is that in the deep open ocean, strong currents disperse waste more effectively and do not concentrate pathogens or parasites as in slower coastal circulation.

Offshore farming is currently not included in the resource rent tax regime. However, adopters of this technology have requested greater clarity from the government regarding the potential risk of offshore licenses being incorporated into the resource rent tax framework in the future. There is concern that fish farmers will bear the full capex and R&D risk to make offshore farming profitable, only for the government to subsequently impose the resource rent tax once operations become profitable. Salmar (Ocean Farm 1) and Nordlaks (Havfarm 1) both have offshore farming solutions in active operation.

Summary

The table illustrates some of the initiatives taken so far by the largest Norwegian salmon farming players, according to publicly available information. As shown, most of the key players are exploring two or more of the alternative production technologies, albeit the scale and progression vary. This underlines how the aggregated impact from the development licenses, regulatory changes and the industry’s reputation works as a carrot and stick toward the salmon farmers, resulting in real actions and developments.

It is not clear today what will develop as the preferred solutions. Our impression is that there is limited information sharing among the fish farmers about the results of all the pilots, trials and attempts made. We believe that the development toward preferred solutions could happen faster if the industry had been more open to exchanging such information, not neglecting that there are also location-specific elements that may impact the preferred solutions for different sites.

| Company       | Submerged systems                                  | Semi-closed containment                                  | Fully closed/RAS at sea                                                                                           | Offshore farms                                                |
|---------------|----------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Mowi          | Trials with submerged pens - Tubenet (Akva Group)  | Aquafarm semi-closed (Aquafarm equipment)                | Aquafarm, Neptun 3 10 active cages and 4 new ordered (Aquafarm equipment)                                         | Exploring offshore, no large-scale farm yet                   |
| Lerøy         | Tested submerged cages in Gjengane, Norway         | Aquatraz S1 via SalMar partnership (Sea farming Systems) | Aquatraz C2 via SalMar partnership (Sea farming systems)                                                          | Not currently focusing on offshore farming                    |
| SalMar        | Submerged tech in Ocean Farm (Ocean Farming)       | Aquatraz S1 (Sea farming systems)                        | Aquatraz C2 6 under construction (Sea farming systems) Marine donut (Bluegreen group) Neptun 4 (Aquafarm Systems) | Ocean Farm 1 (operational), SalMar Aker Ocean (Ocean Farming) |
| Grieg Seafood | No submerged pens                                  | CO2L Flow semi-closed in Canada (Poseidon Ocean System)  | Next Seafood’s fish globes On hold (Joint venture with FishGLOBE)                                                 | Blu Farm On hold (Ekofisk)                                    |
| Cermaq        | Researching and testing submersible pens in Norway | Certus SCCS (Norway and Canada) (FiiZk)                  | One delivered closed farm to Horsvågen, Norway (Aquafarm Equipment)                                               | No offshore farms                                             |
| Nordlaks      | Submerged elements in Havfarm                      | Storbåtsegget (Delivered) (NSK Ship Design)              | Future closed concepts linked to Storbåtsegget                                                                    | Havfarm “Jostein Albert” (operational) (NSK Ship Design)      |
| Hofseth       | Not focused on submerged                           | No semi-closed pens                                      | Egget fully closed systems                                                                                        | No offshore farms                                             |

# Land-based farming – who harvests and who secures financing?

## From concept to commercial reality

Land-based aquaculture has evolved into an interesting growth driver for the seafood industry, propelled by sustainability demands, technological innovation and strong investor confidence. With over NOK 10b invested in early 2025 and industrial-scale projects proving operational viability, the sector is scaling globally across North America, Europe and Asia. Despite high capital intensity and several operational incidents noted for first mover players in recent years, some more successful ventures demonstrate competitive economics and environmental benefits, aiming for land-based salmon farming to capture a larger share of global supply by 2030.

In recent years, some land-based grow-out projects have materialized, most of which are in their early stages and have not

yet achieved consistent production levels. Although the volumes are still insignificant, it is interesting to note that some players have begun harvesting. We have identified a total of 31 companies engaged in grow-out land-based aquaculture across 13 different countries that currently have fish in their tanks. Since our last report, three international companies on our list have either ceased operations or went bankrupt (FIFAX, AquaBounty and Local Coho). This number includes facilities with small volumes that have existed for some time and have not communicated any expansion plans.

In order to understand the progress of new and large grow-out projects, it is more interesting to track the development of the players listed below:

| Company              | First smolt release | First harvest (HOGt) | Harvest volume 2024 (HOGt) | Estimated harvest volume 2025 (HOGt) | Technology |
|----------------------|---------------------|----------------------|----------------------------|--------------------------------------|------------|
| Salmon Evolution     | Q1 2022             | Q4 2022              | 4,891                      | 4,600                                | HFS        |
| Atlantic Sapphire    | Q3 2019             | Q3 2020              | 4,365                      | 5,400                                | RAS        |
| First water          | Q2 2022             | Q2 2024              | 1,700                      | 2,000                                | HFS        |
| Nordic Aqua Partners | Q2 2024             | Q2 2024              | 523                        | 2,300                                | RAS        |
| Andfjord Salmon      | Q3 2022             | Q2 2024              | 0                          | 0                                    | FTS        |
| Bue Salmon           | Q3 2024             | Q2 2024              | 514                        | 1,000                                | FTS        |
| Proximar Seafood     | Q4 2024             | Q3 2024              | 29                         | 3,650                                | RAS        |
| Gigante Salmon       | Q1 2024             | Q1 2025              | 0                          | 1,359                                | FTS        |

The list above includes the largest players in land-based farming of salmon or trout who are in or near the harvesting stage of full-grown food fish. Please note the list is not comprehensive.

In 2024, all companies reported successful harvesting, with the exception of Gigante Salmon and Andfjord Salmon. Nordic Aqua Partners encountered challenges due to elevated geosmin levels, which led to the suspension of their harvest. All of their harvest, totaling 523 tonnes, occurred in Q2 2024. Andfjord Salmon had

no farming operations in 2024 as they focused on expanding their facility and preparations for future production cycles, and they released new smolt in September and October 2025.

Looking ahead, the companies anticipate a significant increase in production starting in 2025. Gigante Salmon achieved its first harvest in Q3 2025, successfully harvesting 694 tonnes in August 2025, with a 91% superior rate.

Notably, all but two of the above projects are backed by Norwegian investors, founders and leadership. Four of the facilities are located in Norway with the remaining in China (Nordic Aqua Partners), Florida (Atlantic Sapphire), Japan (Proximar) and Iceland (First Water).

All the four Norwegian facilities utilize (hybrid) flow-through systems whereas the facilities abroad utilize RAS technology. The HFS/FTS technology is by many viewed to combine the advantages of land-based farming with lower operational and biological risks compared with RAS facilities.

After a rather long pregnancy, the market now closely follows the birth and first baby-steps of these frontrunners. Following a series of unfortunate incidents at Atlantic Sapphire, with a dramatic drop in the share prices as a result, the future development and pace of the long-standing queue of other land-based projects will most certainly cross their fingers for positive operational results in the coming months and years. The financing outlooks will depend on it.

## Evolving capital dynamics in land-based aquaculture

In recent times, there has been a growing demand for capital to bring land-based projects to fruition. In the following sections, we highlight several listed companies and their equity financing activities in 2024 and 2025. Additionally, we provide an overview of their secured debt financing obtained in 2024 and 2025.

The six highlighted listed companies below have in total secured NOK 4,206 million in private placements and NOK 3,324 million in secured debt financing in 2024 and 2025, supporting the ambitious growth plans of many of these players.

## Stock price development

We have evaluated the stock price development of the highlighted listed companies from 1 January 2024 to 8 December 2025. All companies have seen negative development with Andfjord Salmon and Nordic Aqua Partners experiencing the least negative development with decreases of 9% and 4%, respectively. In contrast, Proximar Seafood experienced a 74% downturn in stock price due to biofilter failures in Q4 2024 and mortality incidents in May 2025, followed by a private placement in July 2025 at NOK 1.00 per share, 47% below market price. More critically, Atlantic Sapphire’s stock price plummeted by 99% during this period, raising significant market concerns about the company’s development. Gigante Salmon and Salmon Evolution also faced downturns in stock price of 27% and 28%, respectively. The lower salmon prices in FY25 have put pressure on margins and contribute to the lower stock prices.

## Equity financing

Despite a 99% decrease in stock price for Atlantic Sapphire from January 2024 to October 2025, Atlantic Sapphire has completed NOK 1.1b in four private placements during the same period.

Andfjord Salmon completed private placements totaling NOK 1.4b in 2024 and 2025, with NOK 1.0b raised in 2025. Nordic Aqua Partners raised NOK 392m in 2024 and NOK 421m in 2025, related to a co-investment from two reputable Chinese investors acquiring a 20% stake in the company, bringing the total to NOK 813m.

Gigante Salmon and Salmon Evolution secured significant private placements, raising NOK 225m and NOK 365m, respectively, during 2024 and 2025. Additionally, among the highlighted firms, Proximar Seafood raised NOK 315m in equity financing but notably obtained more than twice that amount in debt financing, as declining salmon prices have impacted profitability.

Land-based farming – who harvests and who secures financing?

Debt financing

DNB and Sparebank1 have been instrumental in several secured debt financing arrangements, working in conjunction with Eksfin, which provides guarantees for debt issuance. Supported by the Norwegian government, Eksfin has played a crucial role in financing the sector. We have observed a remarkable increase in debt financing activity over the past two years.

Prior to 2024, approximately NOK 3.3b was provided in secured debt financing to the firms mentioned above. However, in 2024 and 2025 combined, these firms have secured more than NOK 4.5b in debt financing.

Nearly half of this total belongs to Andfjord Salmon, which successfully issued NOK 750m in bonds in May 2025 and secured an additional NOK 1.3b in secured debt in 2024 and 2025.

Furthermore, Nordic Aqua Partners secured debt financing of NOK 1.0b, with NOK 818m of this amount raised in September 2025,

earmarked for completing the phase 2 buildout and for the future phase 3 buildout.

Proximar Seafood refinanced the debt raised in 2023 in August 2025, securing a total of NOK 694m in debt, refinancing the original loan from a syndicate of three Japanese banks to fund the further development of their land-based RAS for Atlantic salmon.

Atlantic Sapphire, Gigante Salmon and Salmon Evolution raised NOK 341m, NOK 300m and NOK 100m, respectively. Atlantic Sapphire raised debt through a convertible loan issued in September 2025.

Overall, this development shows that both equity financing and debt financing have been available to land-based players, at least selected ones, although the sentiment seems to have become somewhat more challenging in the latter part of 2025 due to lower salmon prices.

Unlisted companies

Among the unlisted companies, it is worth mentioning the fully funded project in Japan led by the Pure Salmon group’s Japanese initiative, Soul of Japan. This project has secured a long-term debt agreement with Sumitomo Mitsui Banking Corporation amounting to NOK 2.3b as of June 2024. Additionally, in January 2025, they raised an extra NOK 5.2b through the 8F Asset Management investment fund.

In Norway, Arctic Seafarm has secured financing for the initial phase of its land-based facilities – NOK2.7b for the first phase in Helgeland. The company has obtained financing for half of the required capital from EMK Capital in 2024.

In Iceland, Samherji secured financing for its phase 1 buildout, raising NOK 2.8b – through equity (NOK 1.5b) and a syndicated loan of NOK 1.3b in January 2025. First Water has secured NOK 1.4b in debt and equity financing in 2024 and 2025, while Laxey has received NOK 2.0b in debt and equity financing during the same time period.

| Company              | Country | Equity financing<br>2024/2025 (NOKm) | Secured debt financing<br>2024/2025 (NOKm) | Secured debt financing<br>prior to 2024/2025<br>(NOKm) | Financing bank 2024/2025                                          | Financing bank prior to<br>2024/2025 | Stock price development<br>1 Jan 2024-15 Sep 2025 |
|----------------------|---------|--------------------------------------|--------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------|---------------------------------------------------|
| Salmon Evolution     | Norway  | 365                                  | 300                                        | 1,550                                                  | DNB and Nordea                                                    | n.a.                                 | -28%                                              |
| Andfjord Salmon      | Norway  | 1,350                                | 2,070                                      | 825                                                    | Sparebank 1 Markets and Nordea                                    | n.a.                                 | -9%                                               |
| Proximar Seafood     | Japan   | 315                                  | 694                                        | 680                                                    | Mizuho Bank Ltd., The Shizuoka Bank and Development Bank of Japan | JA Mitsui Leasing Ltd.               | -74%                                              |
| Atlantic Sapphire    | USA     | 1,138                                | 341                                        | 0                                                      | DNB                                                               | 0                                    | -99%                                              |
| Gigante Salmon       | Norway  | 225                                  | 200                                        | 0                                                      | Gigante Havbruk, Sparebanken 1 Nord-Norge                         | n.a.                                 | -27%                                              |
| Nordic Aqua Partners | China   | 813                                  | 1,037                                      | 264                                                    | DNB, Rabobank and Bank of China                                   | Export Credit Norway                 | -4%                                               |
| Sum                  |         | 4,206                                | 4,642                                      | 3,319                                                  |                                                                   |                                      |                                                   |



# Sustainability reporting and actions in the aquaculture industry

Sustainability has become a key part of the aquaculture industry, affecting how companies operate and make strategic decisions. Over recent years, both large publicly listed companies and smaller actors have reported sustainability-related information. These efforts have been driven by multiple factors, including market positioning, evolving stakeholder expectations, climate change and regulatory developments. Further, sustainability-related risks drive companies to adapt their business activities to the changing environment. As an industry which is highly exposed to the environment, this is particularly significant for long-term resilience of the business.

This article provides an overview of sustainability reporting in the aquaculture industry, based on both mandatory Corporate Sustainability Reporting Directive (CSRD) reports and voluntary reports from smaller companies. The analysis includes four large publicly listed companies and five smaller actors, which do not fall under the CSRD. Eight of these nine companies are within salmon farming, while one produces feed. This analysis compares priorities, reporting practices, actions and targets. It examines

common focus areas such as climate change, biodiversity, fish welfare and feed supply chain impacts.

### Recent developments in reporting

The past year has marked a significant shift in sustainability reporting with the introduction of CSRD, which requires standardized sustainability reporting from companies that exceed certain thresholds<sup>1</sup>. These requirements aim to enforce standardization and transparency in sustainability reporting, both in own operations and along the value chain.

At the same time, voluntary sustainability reporting among smaller aquaculture companies has emerged as a response to growing stakeholder expectations and anticipated regulatory changes. Several smaller companies have developed a solid foundation for ESG data reporting, preparing for CSRD compliance in 2026. However, the EU Omnibus regulation postponed CSRD for SMEs<sup>2</sup>, leaving many voluntary reports reflecting early CSRD preparations despite not being mandatory.

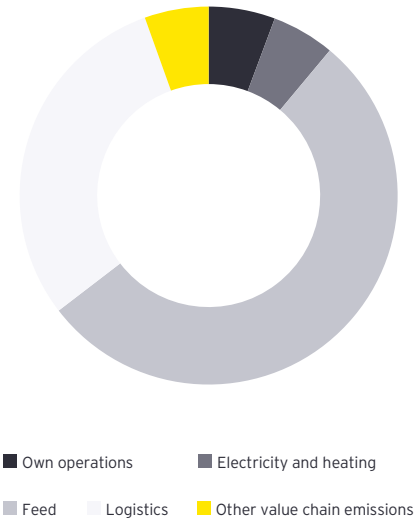
### Climate change

Climate change is consistently identified as a key priority across all analyzed reports. Especially, the CSRD reports of the large companies contain detailed disclosures on direct and indirect impacts, including emissions from feed production, logistics and own operations. Further, the increase in global temperatures leads to significant physical climate risks for the aquaculture industry, which is why some companies have performed thorough climate risk assessments.

Voluntary reports also emphasize climate change, though with less standardized detail. Similar to the large companies, many smaller companies disclose greenhouse gas emissions and outline ambitions for reductions of the emissions, though the detail of reporting varies.

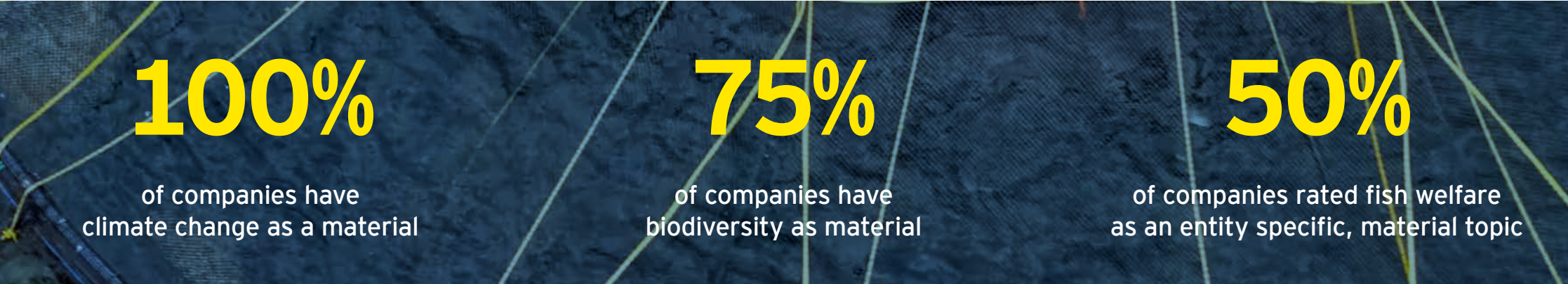
Overall, we see that on average, over 50% of emissions coming from salmon farming are related to the production and distribution of feed, while only 11%-12% stem from energy used in own operations. Another major contributor to overall emissions is distribution and logistics, both in the upstream and downstream value chain.

Average composition of the greenhouse gas inventory of the CSRD-aligned companies



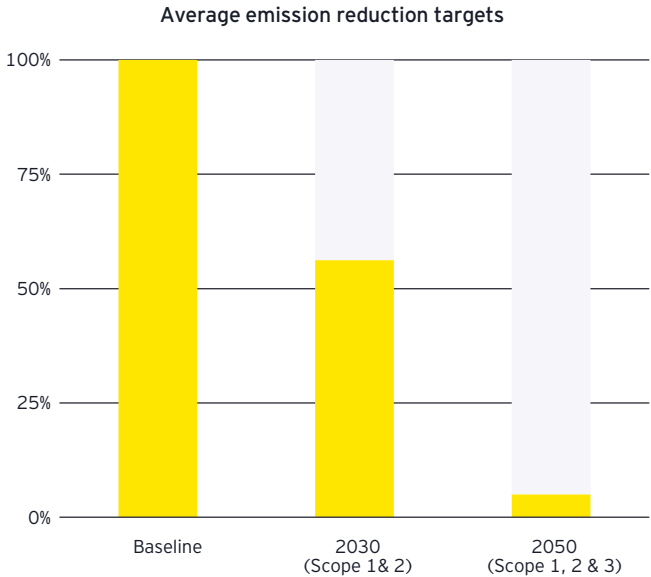
Since the aquaculture industry has a significant climate impact along the whole value chain, reducing emissions is one of the highest priorities for companies. Therefore, all but one of the analyzed companies have set greenhouse gas reductions targets across Scope 1, 2 and 3 emissions, which quantify the ambition to reduce greenhouse gas emissions along the value chain.

On average, we see that the companies aim at a 44% emission reduction of Scope 1 and 2 emissions by 2030, and a 95% emission reduction across all scopes by 2050. Here, we see that larger companies have set a net-zero target for 2050, while some smaller companies have set a 90% reduction target. All companies that have formulated targets have done so aligned with the methodology of the Science-Based Target initiative (SBTi). Half of those have had their targets approved by the SBTi. The targets are measured against a baseline, which most companies have set to be the year 2019 or 2020.



1 Finansdepartementet. (2025, July 3). Bærekraftsrapportering. Hentet fra Regjeringen: [https://www.regjeringen.no/no/tema/okonomi-og-budsjett/finansmarkedene/barekraftsrapportering/id3059140/#tocNode\\_](https://www.regjeringen.no/no/tema/okonomi-og-budsjett/finansmarkedene/barekraftsrapportering/id3059140/#tocNode_)  
2 EY Norway. (2025, November 27). EUs omnibusforslag – hvordan påvirkes bærekraftsrapporteringen? Hentet fra EY: [https://www.ey.com/no\\_no/insights/assurance/eus-omnibusforslag-hvordan-pavirkes-barekraftsrapporteringen](https://www.ey.com/no_no/insights/assurance/eus-omnibusforslag-hvordan-pavirkes-barekraftsrapporteringen)

# Sustainability reporting and actions in the aquaculture industry



The target setting, as well as partial approval by the SBTi, underlines the industry’s ambition to effectively reduce greenhouse gas emissions. However, the path toward the reduction of the emissions requires targeted actions.

### Active reduction of greenhouse gas emissions

The larger salmon farming companies report on a variety of actions, focusing mainly on two areas: The first being reducing emissions from own operations and the other one reducing emissions from the value chain. As shown in graph 1, the majority of the overall emissions comes from the feed production, which does not only affect the climate negatively but also has a profound negative effect on nature and ecosystems. For instance, the cultivation of soy, a key ingredient for salmon feed, can have a severe environmental impact through deforestation. Further, fisheries for anchovies and other forage fish, which are needed for the production of fishmeal and fish oil, are having a profound negative effect on fish stocks. Thus, salmon farming companies

are increasingly investing in innovations in feed to reduce impacts, both on the climate and ecosystems. Key actions include:

- Increasing procurement of feed with certified soy and marine ingredients
- Focus on novel ingredients which have a lower environmental footprint (for example, insect meal, algae oil or byproducts from poultry)
- Focus on the reduction of wild fish content in the feed (FIFO-Index)

Despite reducing value chain emissions in the salmon farming companies, the focus on novel feeds can help mitigate the climate-related risks that feed production is facing. According to the EY climate risks in Norwegian aquaculture report, the supply of conventional raw materials for the feed production can be highly impacted by rising global temperatures, leading to further increasing feed prices<sup>1</sup>. Regarding the reduction of emissions from operations, we see that a majority of companies are focusing on emissions which stem from the operation of vessels and feed barges. In order to reduce those emissions, we see two main actions which are addressed by most of the companies analyzed:

- Connecting feed barges to shore power
- Increasing use of biofuels for vessels

While some companies have already begun powering portions of their vessels with biofuel or have connected their feed barges to shore power, others have plans to implement these measures in the future. Thus, the timeline for implementation varies among companies.

### Other sustainability impacts

Besides climate change, we see that impacts on fish welfare, biodiversity and ecosystems are highly relevant sustainability topics for aquaculture companies. We see that the topics are material for 75% of CSRD reports, with disclosures on direct

impacts (e.g., effluents, escapees) and indirect impacts through feed production. Voluntary reports also acknowledge biodiversity risks, often linked to feed sourcing and local environmental impacts, but typically with less measurable actions.

In particular, salmon escapes are among the most frequently reported sustainability topics within the aquaculture industry. Several factors contribute to this, including potential ecological risks to biodiversity, increased public scrutiny and compliance with national regulations. Companies may also face considerable reputational damage and financial losses due to these incidents. In response to these challenges, companies have implemented various measures to mitigate the risks, including:

- Increasing inspections, using remotely operated vehicles (ROVs)
- Investing in innovative farming systems, such as semi-closed technology
- Developing more effective emergency response plans for potential escape incidents

Given the nature of preventing salmon escapes, variations of these actions are commonly adopted across most reports. More capital-intensive initiatives, such as the development of closed or semi-closed aquaculture systems, are being pursued at varying paces, depending on each company’s strategic outlook. The development and integration of these novel production technologies is further discussed in a separate article in this report.

### Fish welfare

Fish welfare is a recurring theme across all reports, as related indicators, such as mortality, are an important financial metric. However, given that the topic is not regulated through a standard reporting framework, we observe significant variation in how companies define KPIs and set targets for fish welfare. Larger companies often report detailed metrics and action plans, while smaller companies provide narrative descriptions or high-level

commitments. This diversity reflects differences in resources, regulatory exposure and strategic priorities.

Common reporting elements:

- Sea lice management (e.g., thresholds, treatment methods)
- Disease monitoring and biosecurity measures
- Increased use of non-medicinal lice treatments
- Investments in cleaner fish programs

### Summary

The first year of CSRD implementation has introduced more standardized and transparent sustainability reporting in aquaculture. Larger companies provide structured disclosures and measurable targets, while smaller actors report voluntarily with varying detail. Common focus areas include climate change, biodiversity, fish welfare and feed supply chain impacts. Across all reports, there is a clear shift toward reporting concrete actions rather than only ambitions.

The industry stands at a crossroads shaped by climate risks, new technologies and evolving regulations. Whether reporting is mandatory or voluntary, the future will likely emphasize transparency, comparability and measurable progress. These factors are essential for a resilient business model and long-term growth and for ensuring that sustainability reporting becomes a practical tool rather than a compliance exercise. Clearer structures and actionable targets will help companies demonstrate progress and build trust with stakeholders.

<sup>1</sup> EY Norway. (2025, February 28). *Why aquaculture must adapt to risks posed by climate change*. Hentet fra EY: [https://www.ey.com/en\\_no/insights/climate-change-sustainability-services/why-aquaculture-must-adapt-to-risks-posed-by-climate-change](https://www.ey.com/en_no/insights/climate-change-sustainability-services/why-aquaculture-must-adapt-to-risks-posed-by-climate-change)

# Customs and VAT – why staying ahead is critical for the global seafood trade and supply industry

In today's dynamic trade environment, where regulatory changes occur rapidly and unpredictably, effective management of customs and VAT is critical for controlling costs and ensuring compliance. For Norwegian seafood exporters and supply industry, adherence to local requirements under various free trade agreements and accurate product classification is paramount, given the differing qualification criteria and documentation standards across agreements. Recent developments – such as increased duties in the US and EU, new quota systems and heightened compliance obligations – underline the importance of staying informed and proactive.

## The rising complexity of global trade

Over the past year, there has been a noticeable shift toward more protectionist trade policies, e.g., the ongoing dispute with the EU regarding mackerel which may result in import restrictions for Norwegian products to the EU, and a potential decrease in free trade among major markets compared to previous decades. Nevertheless, several new free trade agreements have been concluded. One such example is the agreement between the EFTA countries and India, which came into effect on 1 October 2025. Historically, India imposed relatively high customs duties on imported goods; with seafood duty rate averaging 14.7%. The newly established free trade agreement is comprehensive, allowing for duty-free importation of whole frozen salmon into India from the outset, while other seafood categories will benefit from phased duty reduction over five or 10 years, depending on the specific product.

However, to fully exploit the benefits of such agreements, it is crucial to have an overview of the regulatory requirements and awareness of typical pitfalls with which we too often see companies struggle.

## Key customs challenges for Norwegian businesses

One pitfall for Norwegian businesses is the Union Customs Code, which requires companies to be established within the EU for customs purposes to act as official importers or exporters. However, there is an exemption for "adjacent" countries, allowing Norwegian firms to act as importers of record in Sweden and, to some degree, in Denmark without needing EU establishment. This exception does not apply in other EU member states, and how the rule is interpreted can vary.

Another example of compliance difficulties involves an exemption from transit convention rules – specifically, the requirement to properly classify all goods moving under a transit procedure through the EU. Until recently, this exemption allowed Norwegian goods to transit between northern and southern Norway via Sweden and Finland without full classification. Now, due to an ongoing pilot project (phase 1) for seafood transit from northern Norway, seafood producers must supply accurate HS codes for products moving in transit, meaning the exemption will soon end.

These examples highlight the importance for businesses to stay up to date on regulatory changes and have greater emphasis on core customs issues: goods classification, determining correct country of origin (for both preferential and non-preferential cases), and declared customs value due to higher duty rates. Addressing these areas ensures legal compliance, reduces post-clearance audit risks, enables access to preferential benefits, and may lower duty costs through strategic planning.

## VAT and local registration risks

Experience shows that Norwegian businesses can face challenges abroad if their activities trigger local registration requirements. Do you know if your operations require local registration in other countries? Many Norwegian companies unintentionally incur obligations such as VAT or sales tax registration due to unfamiliarity with local laws. To prevent unnecessary liabilities or manage existing ones, it is essential to understand the relevant VAT or sales tax rules – which can differ significantly, especially across EU countries and US.

## Conclusion – ensuring compliance

So – in summary – staying on top of the relevant customs and trade regulation can enable you to unlock the potential of free trade agreements and avoid unnecessary costs and risks.



# The aquaculture value chain

When discussing the aquaculture industry, the focus is often on the end products – salmon and trout. However, the industry encompasses many stages and actors. The aquaculture value chain includes broodstock (egg and spawn), smolt, edible fish, fish processing (based on farmed fish), export and trade and suppliers of goods and services.

For analytical purposes, the value chain and value creation can be presented in different ways.

Notably, there are three groups of suppliers – technical solutions suppliers, biotechnology suppliers and distributors –which can be challenging to represent in a common value chain. These groups can also be seen as divergent or parallel activities.

Technical solutions suppliers are needed at every stage of the value chain, so presenting them as a single segment may be misleading.

This challenge is similar for biotechnology suppliers, who deliver a wide range of products, including feed, vaccines, medicines and cleaner fish. These products share biological or pharmaceutical raw materials as a common denominator.

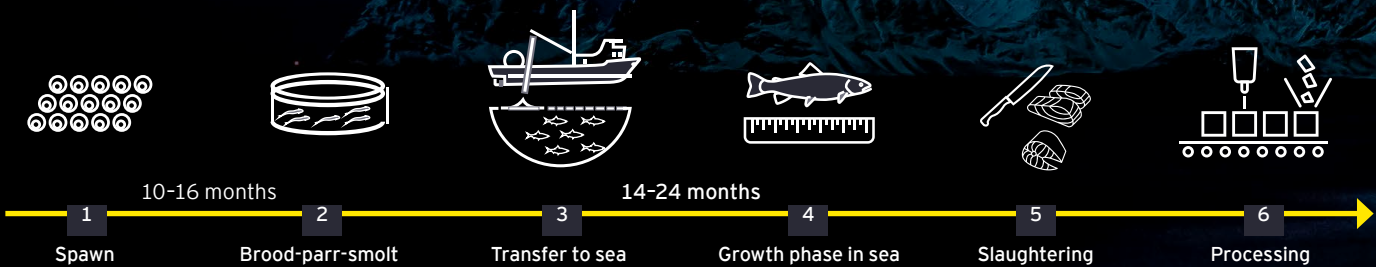
Biotechnology manufacturers supply products to egg and spawn producers, smolt producers and sea farmers.

The distribution phase is equally complex. Sea transportation is required for moving smolt from freshwater to net pens in seawater and for transporting harvestable fish to processing plants. In addition, there are traders and exporters who purchase fish from sea farmers and deliver it to end consumers, either as slaughtered or processed products.

The primary value-creating activity in the industry is production. The production cycle extends over three years. During the first year, eggs are fertilized, and the fish are grown to 100g-250g in weight in controlled freshwater environments. The fish are then transferred to seawater cages, where they are grown to about 4kg-5kg. This growth process takes 14 to 24 months, depending on seawater temperature.

Despite the methodological challenges, we have decided to present technical solutions, biotechnology and distribution alongside production and processing in a single value chain. This approach simplifies the analysis, making it easier to follow and interpret.

## The Atlantic salmon life or production cycle



# Technical solutions

## About the segment

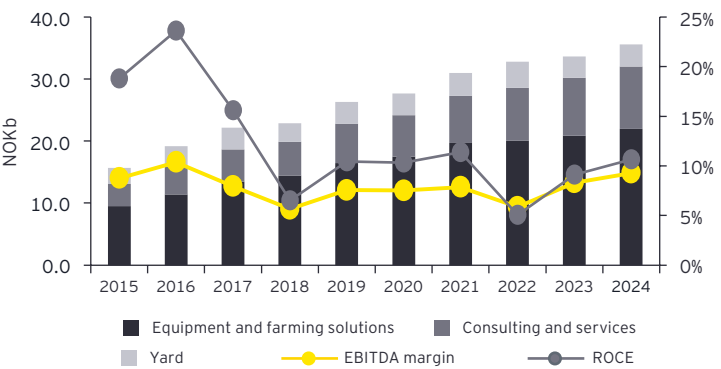
The technical solutions segment includes companies with approximately 50% or more of their business linked to the aquaculture industry yet not directly linked to any other segments. Hence, this segment offers a diverse array of products and services.

The largest companies within this segment are those that produce technical solutions and services specifically developed for the aquaculture industry. These include barges, feeding systems, cages, mooring systems, sea lice treatments, service vessels and software.

We have divided the segment into three subsegments:

- Consulting and services
- Equipment and farming solutions
- Yards

Key financials



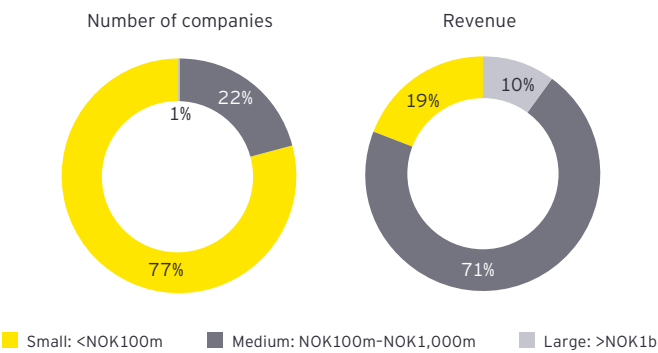
## Segment highlights

Historically, the segment has experienced steady revenue growth. An increased focus on the farmers' environmental footprint and sustainability, along with digitalization, has had a positive spillover effect on this segment, as it encourages farmers to invest in new technology. The year 2024 is no different, and the observed growth is 5.9%. It appears that the customers of this segment have shed some of the uncertainties regarding the resource rent tax during 2024, and the companies are cautiously optimistic for the near-term future. It is important to note, however, that there are significant variations between subsegments.

The EBITDA margin is at its highest since 2016, at 9.3% in 2024.

Despite significant mergers and acquisitions activity in recent years, the segment remains highly fragmented and primarily comprises small-sized companies. Around 77% of these companies generated revenues below NOK 100m in 2024. From 2024 to 2025, there were 43 deals announced involving companies in the segment. On the acquirer side, the transactions were relatively evenly distributed between industrial and financial investors. This reflects an ongoing trend of using M&A to expand product offerings and market positions, alongside a growing interest from financial investors.

Segment composition (2024)





### Consulting and services

The companies in this subsegment offer competency in various specializations across the entire value chain, as well as ongoing maintenance and services for production facilities, vessels and machinery.

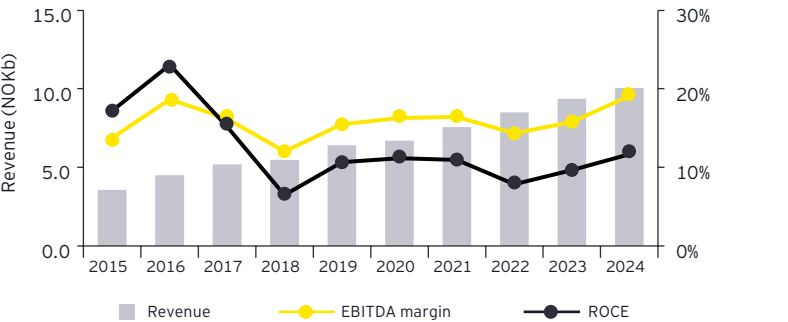
This subsegment comprises mid- and small-sized companies, with the latter making up 86% of the total, indicating a fragmented competitive landscape. There has, however, been a substantial consolidation through mergers among small companies, particularly involving subsidiaries of larger players in the segment. This consolidation has reduced the number of small-sized companies somewhat in the historical period. Between 2024 and 2025, a total of 17 M&A transactions were observed in this subsegment. Targets included companies in both the development and commercial phases, attracting interest from both industrial and financial investors.

Revenue growth remained relatively high in 2024 (7.5%), although it was slightly lower than in 2023 (9.9%) and the compound annual growth rate (CAGR) over the past five years (10.7%). Nonetheless, growth in this subsegment was still the highest among the subsegments (measured in percentage growth) within technical solutions. EBITDA margins strengthened in 2024, increasing from 15.7% in 2023 to 19.1% in 2024, the highest margins we have observed for this subsegment during our 10-year period of releasing this report. Companies reported a strong market with high activity levels, which had normalized from the decline in 2022.

Part of this subsegment is capital intensive, with capital employed having increased significantly over the last five years, primarily due to vessel purchases by some service providers. In 2023 and 2024, capital employed continued to grow. Return on capital employed (ROCE) saw an improvement, returning to levels more in line with the rates of the past five years. The decrease in ROCE in 2022 and the subsequent recovery in 2023 were mainly driven by a one-off increase in net working capital, which resulted in higher capital expenditure (capex) in 2022.

There have been several service vessel transactions in recent years, and we expect continued consolidation also among service vessel companies going forward.

Key financials



### Equipment and farming solutions

The companies in this subsegment offer a variety of equipment and solutions – from the largest players offering nearly all kinds of equipment to smaller and more niche players specializing in more specific types of equipment.

The subsegment experienced modest revenue growth in 2024, at 5.2%, broadly in line with the past five-year CAGR of 5.8%. Growth in the segment was driven by the medium-sized companies, while large-sized companies reported zero growth after five consecutive years of double-digit growth. Revenues from small-sized companies continued to decline, following the historical trend over

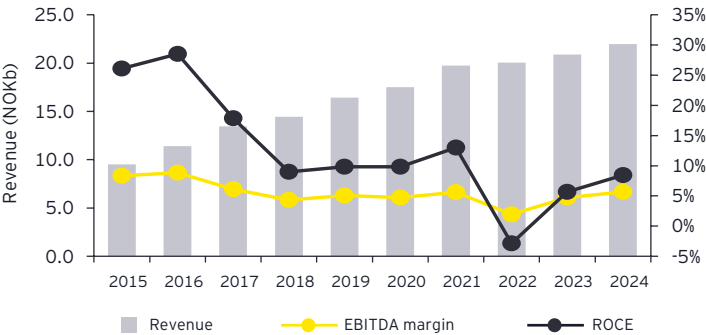
the past five years, primarily driven by fewer and fewer smaller companies within the subsegment.

The margins in the subsegment keep their positive momentum from last year, with an EBITDA margin of 5.7% in 2024 compared to 4.7% in 2023 and 2.0% in 2022. A common theme in the subsegments' reports is that the rate of investments from their customers is increasing, leaving the uncertainty related to the resource rent tax behind. Supply chain issues arising after the war in Ukraine in 2022 have also improved.

The subsegment experienced a substantial increase in capital employed, but an even stronger increase in EBIT in 2024 yielded a ROCE of 8.4%, compared to 5.7% in 2023. The ROCE remains, however, below the levels seen prior to the introduction of the resource rent tax.

We observe trends where companies in the subsegment engage in partnerships through M&A. In 2024 and 2025, 25 deals involving companies in this subsegment were announced. There is consistent interest from financial investors, with a good balance between strategic and financial buyers, and an interesting mix of early-stage businesses and more established firms as targets.

Key financials



### Yards

The yards included in this subsegment primarily focus on constructing or retrofitting well-boats, processing vessels and feed freight vessels.

Due to the nature of their operations, yards can only build a limited number of vessels at a time, and the construction period can extend beyond a year. The market is relatively concentrated, with the top five players accounting for approximately 72% of the subsegment’s revenues in 2024. This concentration can lead to fluctuations, as depicted in the accompanying chart. The number of newbuilds is influenced not only by the growing market demand for well-boat services but also by the need to replace older well-boats with newer, more sustainable technologies.

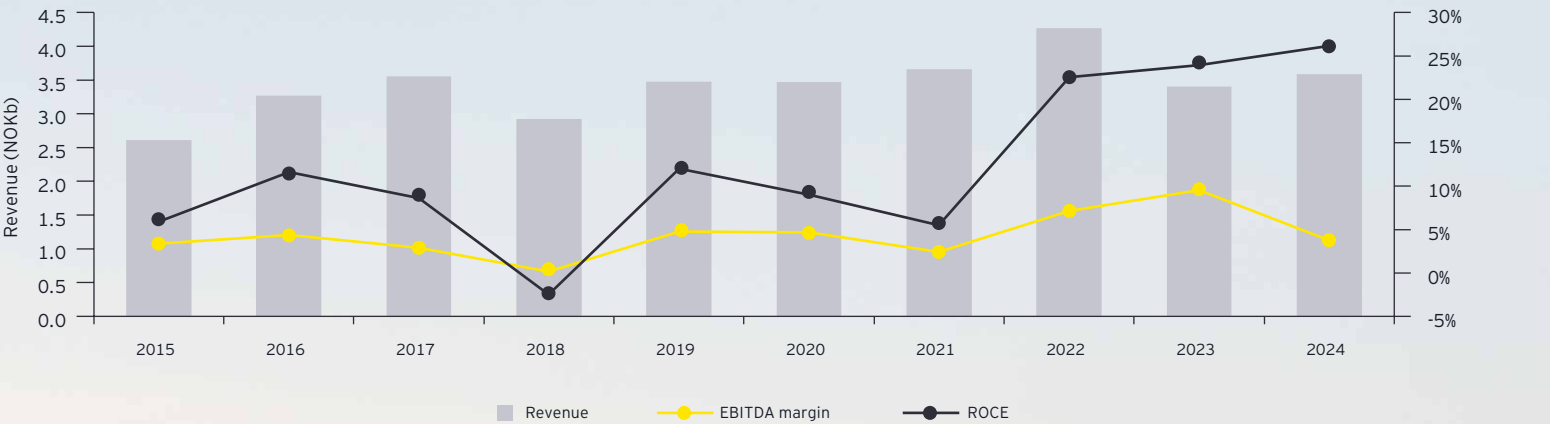
The revenues rebounded to some extent in 2024, with a year-on-year growth of 5.5%, following the -20.3% reduction observed in 2023. The key players appear moderately positive for the near future but highlight continuing issues related to the Russian war in Ukraine and the resource rent tax. The pattern of high volatility among individual companies persists, with key market participants either doubling or reducing their revenues by half in 2024 compared to 2023.

Even though there is an increase in revenues, the EBITDA margin declines to 3.8% in 2024 compared to 9.5% in 2023 and a five-year average of 5.5%. Much of this development is attributable to the one specific company which has had its revenues reduced by 47%, and EBITDA margin reduced from 24% in 2023 to 4% in 2024.

The ROCE increase despite of reduced margins as capital employed per 2024 is only 34% of capital employed per 2023. This development is driven by two of the larger companies that have a significantly higher portion of liabilities to customers on their balance sheets compared to last year. If the capital employed was at historical levels, the ROCE would be approximately 9%, in line with historical levels before 2022.

Although the yard market is considered concentrated in Norway, companies experience significant international competition, especially from low-cost countries.

Key financials



# Biotechnology

## About the segment

Biotechnology refers to the application of biological technologies in product research and development. In aquaculture, modern biotechnology is used for purposes such as reproduction control, disease management, environmental stewardship and biodiversity conservation.

We have divided the segment into two subsegments:

- Fish health
- Feed

## Segment highlights

Biotechnology not only enhances production but also enables sustainability and the ability to respond to environmental threats. Efforts within the segment improve the likelihood of maintaining healthy fish stocks at low prices by contributing to nutritious feed and effective disease prevention.

The biotechnology segment has seen substantial growth over the past decade, with a compound annual revenue growth rate of 13.7 % from 2015 to 2024. This growth has been positively influenced by high salmon prices and limited volume growth due to biological issues, leading to higher demand for healthy and efficient fish feed, medicines, vaccines and related products.

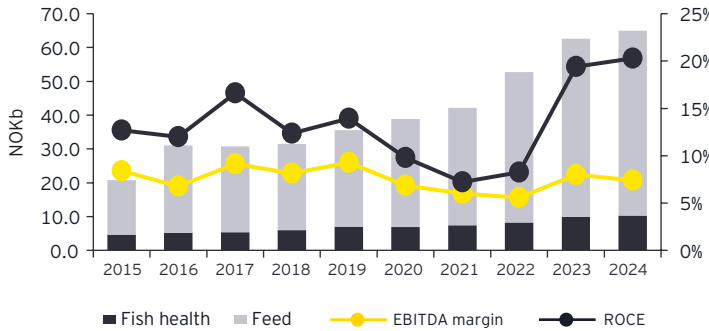
Since 2019, the EBITDA margin has gradually declined from 9.3% to 5.6% in 2022, primarily due to higher raw material prices and increased competition in the feed subsegment. This trend reversed in 2023, with the EBITDA margin rising to 8.0%, particularly driven by the stabilization of cost pressures and

increased revenue. In 2024, the EBITDA margin declined slightly to 7.4%, primarily driven by the fish health subsegment where we saw a general margin reduction for many of the companies.

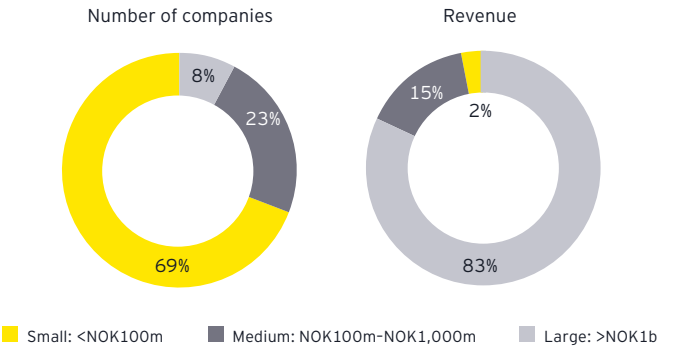
The fish health industry reached a new all-time high in revenue with a growth of 4.1% from 2023 to 2024. The genetics portion of the segment continued to emerge as a leading growth driver in 2024, especially fueled by high demand for new vaccines, primarily for salmon. We believe that the external focus on the industry's ongoing challenges with fish welfare is contributing to this trend, and we expect this trend to continue in the coming years.

The ROCE jump in 2023 is primarily driven by the significant margin increase within the feed subsegment in 2023, going from a margin of 3%-4% in 2021 and 2022 to 5% in 2023. This margin expansion was achieved without significant increase in capital employed and as such it had a positive impact on ROCE.

Key financials



Segment composition (2024)



### Fish health

The financial outcomes in the fish farming industry are heavily dependent on the health and quality of the fish. Entities within the fish health subsegment provide products, services, research and development projects that are crucial for maintaining and improving fish health in the global aquaculture industry. This subsegment also includes the breeding and genetics companies that supply genetic material (i.e., fish eggs or fry) to the fish farmers. Unlike the feed subsegment, where only a limited share of the volume produced in Norway is exported, companies in the fish health segment have a higher degree of export.

### Finding solutions to biological challenges

Biological issues continue to pose significant challenges for Norwegian salmon farmers. Sea lice remain the biggest threat to Norwegian fish health, but other risks such as pancreas disease (PD), infectious salmon anemia (ISA), and heart and skeletal muscle inflammation (HSMI) are also of concern.

Addressing the sea lice issue demands a combined effort from the entire aquaculture industry, including research into pharmaceuticals and vaccines, breeding technologies and genetics, functional feeds and mechanical and biological methods for lice removal. Several companies within the fish health subsegment have provided medicinal treatments to combat sea lice and are constantly developing new and improved pharmaceuticals.

Despite major investments to tackle sea lice and other aquaculture-related biological challenges, fish health has faced increased scrutiny over the past three years, with anticipated results not materializing as expected. The Norwegian Veterinary Institute, in its 2024 edition of the Fish Health Report, notes that the mortality rate remains high with an increasing number of recorded fish deaths in net pens. They attribute the situation to various diseases and lice treatments, which cause considerable stress on the fish.

### Strong revenue growth within the subsegment

Increased focus on fish health has been the main driver of revenue and margin growth in the fish health subsegment over the past decade. From 2020 to 2022, the fish health subsegment experienced somewhat slower revenue growth and lower margins after the positive financial performance in 2018-2019, mainly due to rising costs. In 2023, the revenue growth, however, surged by over 20%. In 2024, higher costs and slower revenue growth drove a lower EBITDA margin compared to the prior year, though levels remain strong in a historical perspective. This performance reflects modest growth across global salmonid markets combined with increased demand for ISA and SRS vaccines.

In 2024, it was particularly the large companies within fish health that drove the majority of the revenue growth, with a revenue increase of 9.5% compared to approximately zero percent for small and mid-sized companies. The large-sized companies within this subsegment experienced an EBITDA margin decrease from 31.7% in 2023 to 27.4% in 2024.

### Return on capital employed

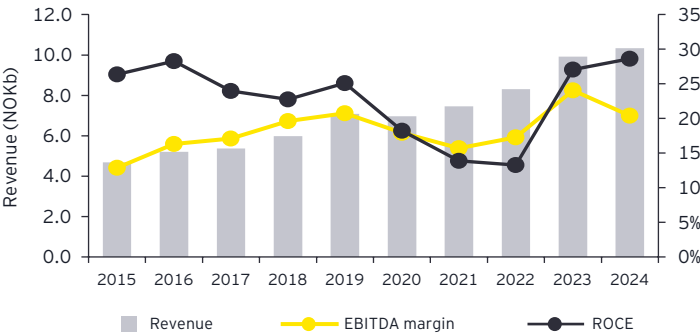
The ROCE development in this subsegment is heavily impacted by the various cleaning fish companies. These are relatively capital intensive, and they have experienced significant challenges during this period. When included in the full dataset, capital employed for these companies accounted for approximately 10%-20% of the subsegment in the 2021-2024 period, while EBIT for the same companies was negative three out of four years in this period (with the one period with positive being driven by an exceptional item for one specific company).

If we exclude these companies, the ROCE development is much more stable and shows a general positive trend from a low point in 2021 as illustrated in the chart.

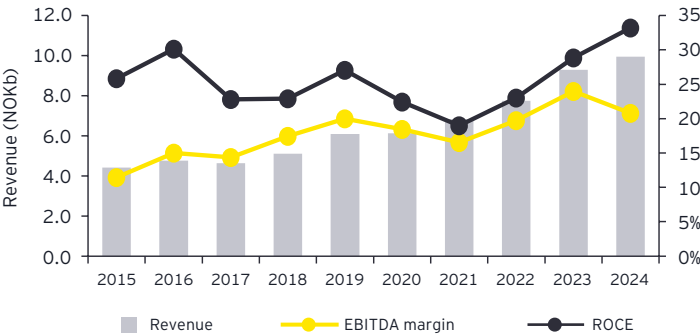
### Slowing M&A activity within the industry

The year 2024 saw several transactions driven by strong margin improvements and revenue growth, including the sale of Stim AS to Summa Equity and Benchmark Genetics to Novo Holdings. In contrast, 2025 has so far recorded fewer significant deals in the fish health subsegment.

Key financials



Key financials excluding “cleaning fish” companies



Feed

The feed subsegment includes feed producers and companies producing and supplying input factors to feed production. In 2024, input costs remained elevated but more stable after the sharp step-up the year before. Feed prices per kilogram stayed high as raw material markets remained tight, though with less volatility than in 2022-2023<sup>1</sup>. While the feed producers included in this subsegment also supply other species, salmonid feed still makes up a significant share of total output, with cod feed as a growing venture.

Ongoing shortages of marine ingredients such as fishmeal and fish oil have continued to push the industry toward plant-based and novel feed ingredients. Marine inclusion rates have been declining over time. In 2024, BioMar reported a Forage Fish Dependency Ratio (FFDR) of 0.462, meaning that only 0.46 kilograms of wild fish were needed for each kilogram of feed produced. This represents a record low compared to FFDR levels of ~1.5 in 2019 and 2020. Reducing FFDR is an important step toward a more sustainable aquaculture sector.

Given Norway’s national ambition that 25% of feed ingredients should originate domestically and that all feed used in aquaculture should come from sustainable sources by 2034<sup>3</sup>, feed producers are accelerating efforts to develop alternative inputs. Novel

components such as microalgae, insect meal and single-cell proteins are gaining traction as part of the drive toward more sustainable feed solutions. The need for new omega-3 sources is particularly pressing, as fish oil, the traditional source, faces limited supply and slower growth compared to aquaculture production volumes. In 2024, BioMar reported that 40% of the omega-3 content in its feed was derived from microalgae<sup>2</sup>. This marks a significant step toward reducing dependency on fish oil and demonstrates that microalgae can serve as a scalable omega-3 source for future production growth.

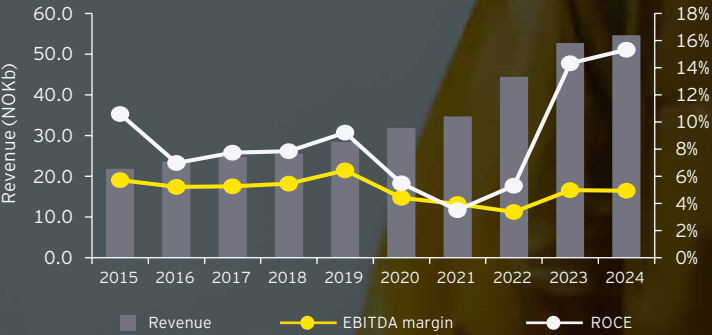
Feed market dominated by a handful of playersThe salmonid feed industry remains highly consolidated and consists of a few large producers controlling most of the salmon feed produced. In recent years, the top four companies have consistently accounted for close to 90% of subsegment revenues.

Continued revenue growth and stable marginsThe subsegment sustained its expansion in 2024, with revenue increasing to NOK 54.6b (from NOK 52.7b in 2023), reflecting ongoing volume growth alongside normalized pricing dynamics. Since 2018, the revenue growth has been significant, including double-digit increases in 2019 (11.7%), 2020 (12.0%), 2022 (27.9%) and 2023 (18.5%), in 2024 growth moderated to +3.6%, a moderation seen in context with the cost of raw materials.

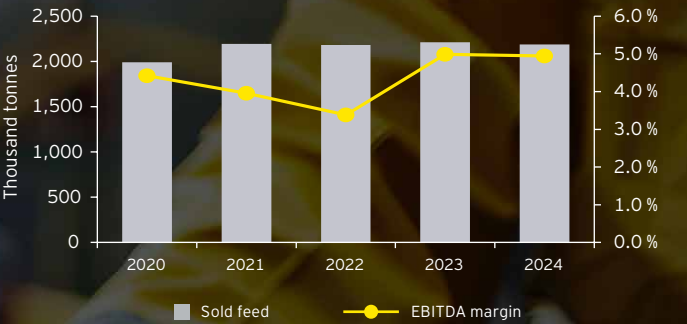
Raw material dynamics in 2023 and 2024 were dominated by fish oil supply shocks from Peru. Constrained anchovy quotas and poor fishing conditions pushed fish oil prices to multi-year highs in 2023, more than 50% above 2022, and kept them exceptionally high through most of 2024. Toward the end of 2024, signs of normalization appeared, but prices remain at elevated levels compared to pre-2022 averages. Fishmeal followed a similar pattern, rising about 15% in 2023 and then stabilizing at a high level in 2024. Dependence on Peruvian supply continues to be a material risk factor for feed producers and reinforces the need to scale alternative omega-3 sources.

Against this backdrop, EBITDA increased to NOK 2.7b in 2024, and the EBITDA margin held around ~4.9%, stabilizing after the rebound from 3.4% in 2022 to ~5.0% in 2023. ROCE advanced further to ~15% in 2024, following the jump from ~5% in 2022 to ~14% in 2023. The EBITDA margin expansion was achieved without significant increase in capital employed and as such it had a greatly positive impact on ROCE. Isolating the largest feed producers, EBITDA margins decreased from ~5.0% in 2019 to ~2.0% in 2022 and ~2.9% in 2023, followed by a recovery to ~5.5% in 2024.

Key financials



Feed EBITDA margin and volume development



Source: Directorate of Fisheries, EY

1: The Fat Trout Weekly, DNB Carnegie 2025  
2: Biomar Råvarerekord, <https://www.biomar.com/no-no/innsikt/nyheter/ravarerekord-Hurdalaplattformen>, Regjeringen 2021

# Production

## About the segment

The production segment encompasses the entire life cycle of fish, from the breeding and fertilization of eggs, through the nurturing of fry to smoltification, and finally, their transfer to the sea to grow to harvest size.

We have categorized land-based farming as a distinct subsegment. Although the current production volume in this subsegment is minimal, the numerous identified land-based projects suggest it could become a noticeable complementary production method in Norway. However, the actualization of these project initiatives remains uncertain.

- To reflect the various stages of the production cycle, we have divided this segment into three subsegments:
- Broodstock and smolt production
  - Sea farming
  - Land-based farming

Quality assurance in the initial stages of the cycle is crucial for successful sea farming, leading to considerable vertical integration within this segment. Sea farming companies have expanded into upstream activities to facilitate access to high-quality broodstock or eggs and to manage the handling and vaccination of fry during the freshwater stage.

The segment consists of more than 300 companies. However, a relatively small number of these companies account for most of the value creation.

## Segment highlights

The production segment has experienced substantial growth from 2015 to 2024, with a notable acceleration from 2016 and again in 2022, driven by significant increases in prices and favorable currency exchange rates for exports.

Due to high profitability and rising demand for various supporting services, the sector has become a major contributor to value and job creation along the Norwegian coast. There is ongoing concern about the sector’s challenges related to sea lice and other biological and environmental issues. These challenges have led to increased costs and reduced volumes. Despite revenues reaching an all-time high in 2023 and 2024, the cost per kilogram (WFE) also peaked at NOK 58 and NOK 63 in 2023 and 2024. As a result, the EBITDA margin in the sea farming subsegment dropped from 33.4% in 2022 to 21.1% in 2024. Biological challenges have curbed growth in production volumes over the past few years, and from 2022 to 2023, the volume decreased by 3%, paradoxically driving up prices and profits in the short term. However, sustainable volume growth is crucial for the long-term expansion of the industry and to feed a growing global population. Therefore, biological challenges and diseases, along with potential reputational impacts, remain the major concerns for the industry’s future. In 2024, volumes have bounced back to 2022 levels, and in 2025, volumes have reached new all-time highs (with corresponding negative impact on salmon prices and thus many farmers report of poor operational cash flow in 2025). The broodstock and smolt production subsegment has seen massive growth since the introduction of the resource rent tax in 2022. From 2022 to 2024, revenue has increased by 61%, and EBITDA margins jumped from 24.5% in 2023 to 31.8% in 2024. The resource rent tax incentivizes higher earnings in smolt production,

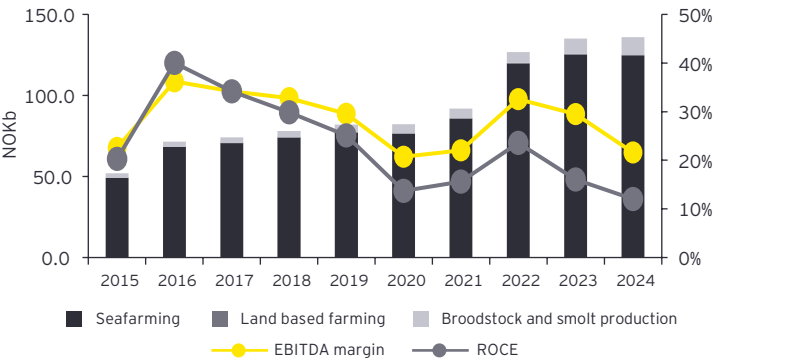
leading to increased prices and margins. The trend of producing larger post-smolt continues, requiring significant investments in R&D and new facilities.

Land-based farming has emerged in response to stagnating sea farming volumes and increased demand. Since 2018, the number of planned projects has grown, yet few have achieved full-scale production. As of 2024, there is still a limited number of land-based companies in Norway that have harvested notable volumes. Many projects are encountering technical challenges and slower-than-expected progress. Despite these setbacks, some large-scale projects have secured funding and begun construction. Further, in July 2025, the new Norwegian regulations for land-based facilities came in place, finally opening up for new land-based applications after this regulatory window has been closed since December 2022.

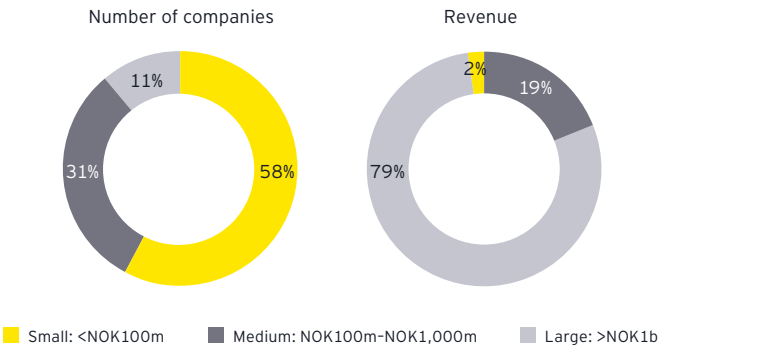
Reduced margins for pure play production companiesThe resource rent tax of 25%, effective from 1 January 2023, prompted several companies to establish new pure play production companies at the end of 2022 in preparation for the new tax regime. The new production companies typically include only licenses and biomass, along with a handful of employees, and they procure all other input factors from other group entities at market prices, which leads to increasing costs and reduced margins. The impact becomes clear when comparing the EBIT margin for non-restructured sea farming companies, which stands at 14.6%, with that of the pure production companies at 8.8%. We observe that a number of medium-sized companies are now adopting similar corporate structures for 2025. This shift has posed challenges for the financial figures for 2023 and 2024, as these restructurings have resulted in significant internal revenues

and costs within the entities classified as sea farming production companies. Consequently, we have made manual adjustments for internal transactions in this year’s report in an attempt to create comparable data with previous years.

Key financials



Segment composition (2024)



\* Note that many of the legal entities in this report are, in reality, part of the same group.



Broodstock and smolt production

The companies in this subsegment specialize in broodstock and smolt production. Some operate independently, while others are fully or partially owned by sea farmers or other industry players.

Smoltification is the biological process that prepares young fish for the transition from freshwater to seawater. Fish that have undergone this process are called smolts. This is the middle stage of the production cycle, managed by smolt producers. In specialized fish farms with optimized conditions, the smoltification process takes 10 to 16 months.

High growth in 2023 and 2024

Over the last decade, these companies have experienced continuous revenue growth, with increasing EBITDA margins after 2017. This trend shifted in 2021, with a slowdown in revenue growth and a drop in margins. However, this is somewhat misleading, at least in terms of revenue development, as the primary reason for this change is mergers, where companies previously vertically integrated through separate entities have now merged.

The margin drop was driven by a few entities. Maintenance and upgrades resulted in one player having significantly fewer smolt generations in 2021. Furthermore, concerns about disease led to the culling of fish. In 2022, the trend reversed, with double-digit revenue growth and margin increases, resulting in an all-time high EBITDA for the subsegment.

This all-time high from 2022 was surpassed in 2023 by a clear margin. Revenues increased by more than 39% to NOK 9.4b, primarily due to price increases for smolt. As a result, the EBITDA margin rose from 24.5% to 33.7%, more than 10 percentage points higher than the previous eight-year average EBITDA margin of 22.4%. Higher margins also more than doubled ROCE to 12%.

The resource rent tax and transfer pricing

With the introduction of the resource rent tax, higher prices and earnings in the smolt segment were expected.

The top five companies by revenue in this subsegment, along with many others, are fully or partially owned by sea farming companies. The high degree of cross-ownership and intergroup trade, along with other long-term business relationships, has contributed to the stable revenue growth and EBITDA margin observed in this subsegment historically. With the resource rent tax, which does not apply to the smolt phase on land, vertically integrated sea farming groups have been incentivized to retain higher earnings in the smolt-producing entities. Indeed, the 2023 and 2024 numbers clearly reveal that increased focus on market-based pricing for this crucial part of the production cycle has resulted in higher prices, revenues and margins for this subsegment.

Larger post-smolt

The trend of producing larger smolts (250 g+), commonly referred to as post-smolts, continues. Some smolt producers raise smolts up to 1 kg before sea transfer. The rationale for using larger post-smolts is to reduce the time at sea, thus minimizing exposure to uncontrollable risk factors such as sea lice and diseases. The post-smolt initiatives have been ongoing for some years now, and the reports from farmers indicate a reduced need for delousing and fewer occurrences of PD. The resource rent tax regime will likely provide additional incentives for farmers to grow smolts larger on land before transferring them to the sea, thereby reducing the earnings subject to the resource rent tax.

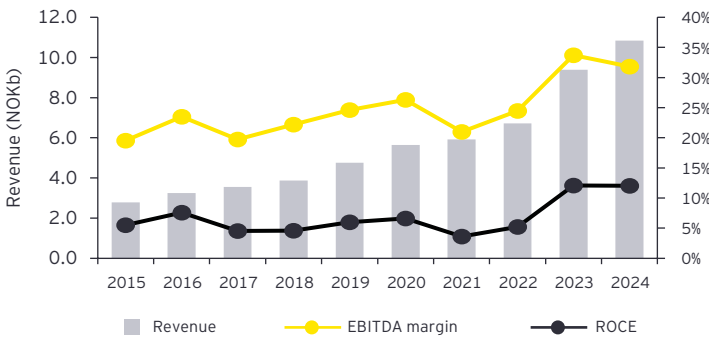
Increasing smolt size requires extensive investments in R&D and new facilities. When the resource rent tax was announced, we saw an immediate halt in such investments due to the uncertainties that arose. Also, investments on land were not deductible within

the resource rent tax regime. In 2023 and 2024, we observed that paused and new investments in post-smolt facilities are moving forward again.

Recirculatory aquaculture system (RAS) technology

As RAS technology advances, there has been a rise in land-based smolt facilities utilizing this method. RAS is a system that recirculates water in fish tanks, enabling companies to produce large quantities of fish while consuming relatively low amounts of water. Historically, most of the smolt facilities in Norway have operated using traditional flow-through systems (FTS). However, most new smolt facilities are being constructed with RAS technology.

Key financials





Sea farming

The final step in the production process is sea farming, which is the largest subsegment in the Norwegian aquaculture industry when measured by EBITDA contribution. In this stage, fish are placed into seawater and grown until they reach harvest size, approximately between 4 kg and 5 kg. This growth period usually spans 10 to 24 months, depending on the size of the smolt and other growth factors.

Structural changes require manual adjustments

In response to the implementation of the resource rent tax, major Norwegian farming companies have undertaken significant structural changes to adapt to the new tax regime. Many companies have transferred their biomass and licenses to separate entities to establish a “pure play entity” for operations subject to the resource rent tax. Previously, these companies had a high degree of vertical integration within a single legal entity, resulting in minimal transfer pricing complexities. However, with the implementation of the resource rent tax, there has been a significant increase in intercompany transactions for both services provided and products sold. Most of the largest companies performed this restructuring with effect from the end of 2022 and beginning of 2023, while others followed in 2024 and 2025.

Our analysis includes several manual adjustments of the 2022 and 2023 figures in an attempt to increase comparability with previous periods. The primary adjustments have been to account for intercompany sales and purchases, which are typically disclosed in the notes to the companies’ financial statement.

Salmon price records

The historically high profitability in the sea farming segment is partly linked to a high and increasing salmon price. The average price for farmed Atlantic salmon has increased by roughly 70% since 2020, rising from NOK 56 in 2020 to NOK 95 in 2024. The average price set an all-time record in 2022 at NOK 83, but this record was surpassed again in both 2023 and 2024 when the average price exceeded NOK 94. This increase is attributed to continued high demand for salmon, a weak Norwegian currency and the global supply of salmon. Although the price increased by 13% between 2022 and 2023, the EBITDA margin dropped from 33.4% in 2022 to 29.7% in 2023. Prices remained similar to 2023 in 2024, but EBITDA margins continued to decline and ended up at 21.1%, indicating that factors other than price have influenced this decline. Prices in 2025 have been relatively low, with a YTD average as of mid-December at approximately NOK 78, a significant drop from 2024. This is seen in context with better biology and lower mortality, resulting in a higher volume of salmon introduced to the market.

Challenges with production and reduced volumes

In 2019, the segment experienced noteworthy growth in harvest volume, marking a milestone after years of stagnation. The volume grew by approximately 7% compared to 2018, while the CAGR from 2014 to 2018 was only 0.4%. Record-high volumes were achieved in 2021, with an increase of almost 12% from 2020. The record level of quantity in tonnes round weight of 1.66 million (WFE) has not yet been surpassed, but each of the following years has returned volumes in the 1.60 to 1.65 million range.

The drop in volume in 2023 can primarily be explained by biological issues. Reports to the Directorate of Fisheries show that a total of 66 million farmed salmon either died or were in such poor condition that they were registered as discards in 2023. This increase from 59 million in 2022 can largely be explained by the string jellyfish attacks in the fall of 2023 and salmon destroyed

in production area 8 to prevent the spread of PD. Gill problems, diseases, delousing operations and water environment contribute to the increased risk of mortality in farmed salmon at sea. In 2024, the number of dead fish and discards was more similar to 2022 at 61 million.

It is worth noting that the number of grow-out licenses has increased from 990 in 2016 to 1,195 in 2024. Additionally, there has been a rise in the number of R&D and development licenses, which have increased from 98 to 137 during the same period. However, while the number of licenses has increased, we observe a drop in the produced volume of salmon per license and the 2024 volume per license is down almost 7% from the top in 2021. Changes in the traffic light in the various regions will naturally impact yield per license, and multiple areas saw “red lights” both in 2022 and in 2024.

Significant cost increases continue to put pressure on margins

Over the years, the industry has faced numerous challenges, including diseases, sea lice infestations, severe weather conditions, rising raw material costs, and other operational and biological issues. As a result, our analysis indicates that the production cost per kilogram has surged by approximately 112% over the past 10 years.

It is important to note that our analysis provides a simplified view, as it considers aggregated figures from annual accounts without distinguishing between production costs and other expenses. Furthermore, given the restructuring and creation of license companies, we have had to perform multiple manual adjustments in an attempt to present the non-intercompany cost per kilogram figures. Consequently, our numbers should be considered a rough estimate and are best used as an indicator of the underlying development rather than the hard truth.





During 2020 and 2021, the industry experienced a combination of increased costs per kilogram and decreased revenue per kilogram, leading to the lowest EBITDA margins (approximately 20%-22%) for the segment since the Norwegian Aquaculture Analysis began. Despite prevailing high salmon prices in 2023 and 2024, cost per kilogram increased and reached NOK 58 in 2023 and NOK 61 in 2024 (WFE), resulting in a continued pressure on EBITDA margins.

While all cost components have increased, the cost of goods sold and other operating expenses have contributed the most to the overall increase. The cost of goods sold is largely attributed to feed expenses, and the increase in operating expenses is influenced by changes in company structure, with several companies restructuring due to the resource rent tax.

Investments

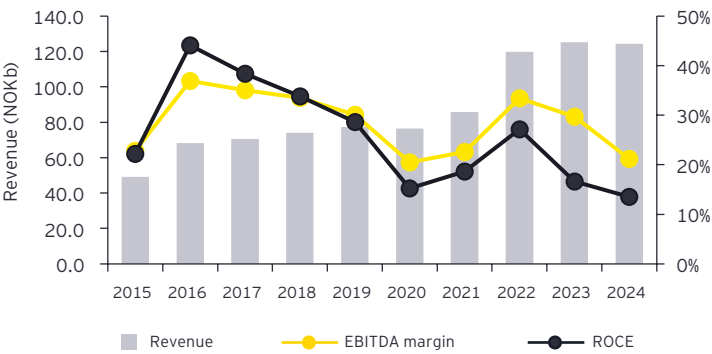
Prior to 2023, there was a notable rise in capital expenditure and R&D investments within the industry. However, with the announcement of the new tax regime late in 2022, several investments were put on hold. Our experience is that investments are once again being taken, and the introduction of new regulation opening up for previous MAB reductions being reversed if new technologies are applied should fuel an interest in investments within the subsegment.

Regulatory updates

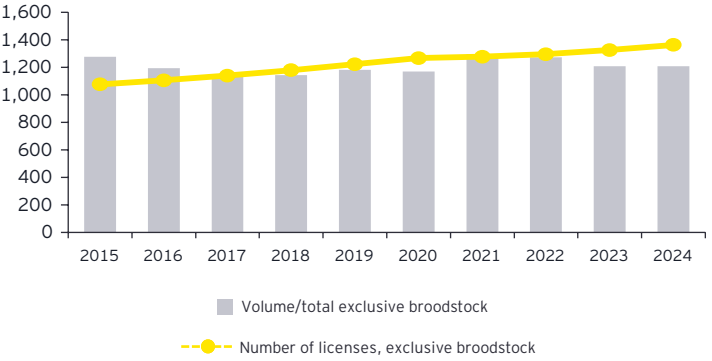
The aquaculture industry in Norway has impatiently waited for the government’s white paper, suggesting a new regulatory framework for the industry. In April 2025, the white paper was put forward, suggesting, e.g., to end the traffic light system, remove the MAB limitations, tax on lost fish and a sea lice quota system. The reactions were mixed and after an intense political debate, the white paper was temporarily put aside and a broad coalition of the political parties in the Norwegian Parliament, including the government, mutually agreed that the consequences of the proposals would be further assessed and discussed before a final decision is made. This is expected to happen in 2026 at the earliest. It remains to be seen what will be the end result, but a move from volume-based to more impact-based regulations seem likely.

In October 2025, the government put forward a new Environmental Technology Scheme that in short will allow fish farmers in red zones to reclaim reduced production capacity if they produce with closed containment, reducing the environmental impact in their production area. Once the fish farmers provide documentation of external verification that certain requirements are met, they can again use the previously withdrawn capacity. It will be interesting to see how many fish farmers in the relevant production areas will take on the large investments needed and to what extent this will have a positive impact on the production volume development.

Key financials

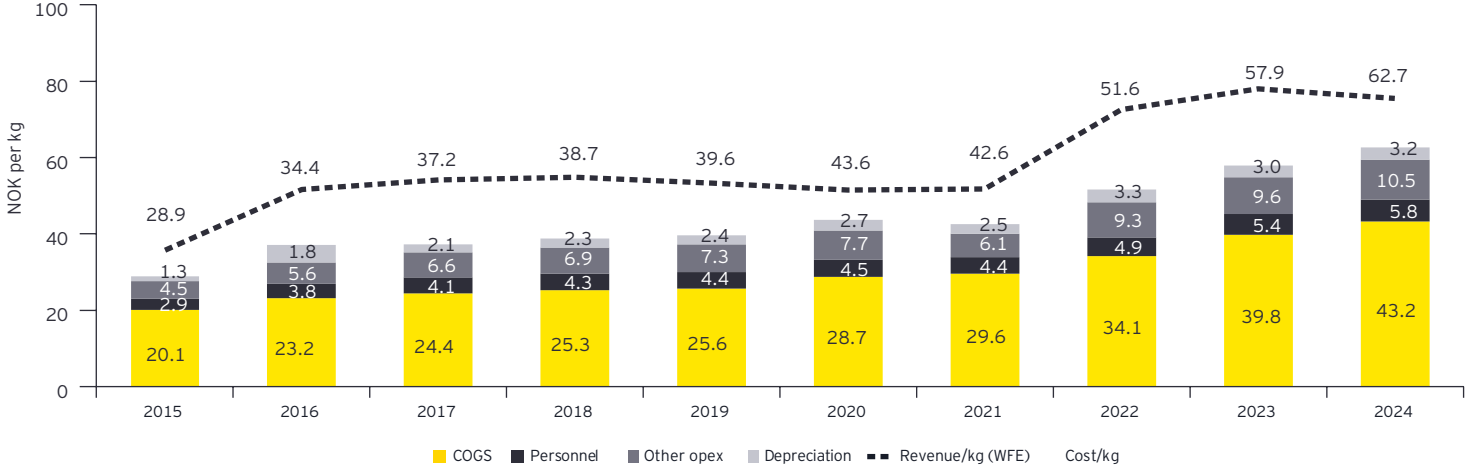


Development in number of licenses and harvest volume per license



Source: Directorate of Fisheries

Cost per kg (WFE) development





Two years with pure play production companies

The new tax regime, which impacts the production phase at sea, has prompted several companies to restructure, by transferring licenses and biomass to separate legal entities. Most of these companies implemented these changes before the end of 2022 but more has followed. As a result, we now have two years with financial data for multiple pure play production companies. Production in the pens is a crucial part of the larger value chain and is often hypothesized to be the most profitable phase.

Typically, these new pure play companies employ very few staff and procure sea farming services, feed and equipment from other companies within their group. Internal transfer prices must be set at market rates, making it important to analyze these companies and compare their financial performance with sea farming companies that have not undergone similar restructuring.

The new tax regime incentivizes minimizing value creation in the pens and maximizing value on land to reduce the 25% additional tax burden imposed by the resource rent tax. Replacing in-company cost-based equipment and services with market-priced deliveries from another company within the same group is expected to increase costs and reduce margins for the pure play production companies. A comparison of the financial results of these new production companies with those of other sea farming companies that have not restructured confirms these expectations.

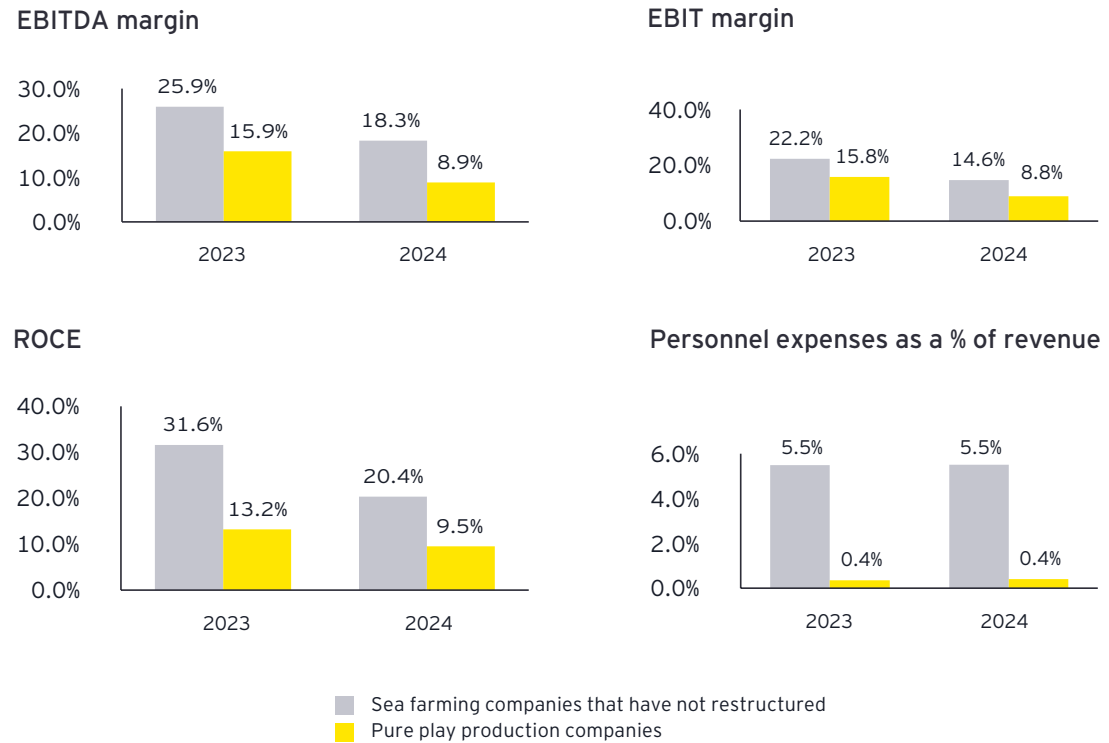
The EBITDA margin for the sea farming companies that have not restructured was 25.9% and 18.3% for 2023 and 2024, respectively, which differs from the EBITDA margin of 29.7% and 21.1% for the entire segment mentioned on the previous page. This discrepancy arises because the margin is retained within internal operating companies to ensure accurate comparisons with previous years. However, focusing solely on the farming companies that have not undergone restructuring, the margin stands at 18.3% in 2024. In comparison, the pure play production

companies report a significantly lower EBITDA margin of 8.9%, primarily due to the higher cost of goods sold and other operating expenses. We note that comparing EBITDA may skew the picture somewhat as the capital element that is depreciation is part of the EBITDA for the pure play production companies, while it is not part of the EBITDA of the non-restructured companies. We observe an EBIT margin of 15.8% for the non-restructured companies, while the pure play production companies report an EBIT margin of 8.8% – closely aligned with the EBITDA margin (i.e., limited depreciation within the pure play production companies).

The higher cost of goods sold and other operating expenses of the pure play production companies reflect market pricing for input factors such as smolt, farming equipment, service vessel services and various farming operational services. On the other hand, direct personnel expenses are minimal due to the limited number of employees in these companies. The combination of high capital employed, including the biomass and lower margins, results in a ROCE that is less than half that of the non-structured companies.

The hypothesis of reduced margins in the pure production companies is confirmed by the observed numbers. Lower margins result in a lower resource rent tax. Operational companies now sell their farming services, smolt and feed at market prices, thereby reducing the taxable income of the pure production companies. This restructuring effectively delineates activities affected by the resource rent tax from those that are not.

KPIs of pure production companies versus non-restructured sea farming companies



Example of new structure





Land-based farming

Following years of stagnation in traditional net-pen production and rising global demand, land-based aquaculture has emerged as a strategic alternative. Since 2018, the sector has seen a surge in planned projects, particularly in Norway, alongside growing international interest. By 2025, several industrial-scale facilities have moved beyond concept to operation, demonstrating biological performance and commercial viability, while many other projects remain in development or early-stage production. Despite progress, the number of fully operational grow-out sites is still limited compared to initial ambitions, reflecting the capital intensity and technical complexity of scaling land-based systems. Nevertheless, successful projects signal a maturing segment poised to play an increasingly important role in meeting future salmon supply needs.

While some land-based farming projects are operational in Norway, many are still in the start-up phase and have yet to achieve steady-state production. To monitor the growth and development of land-based farming, we have included these companies as a separate subsegment in our analysis.

Given the public availability of financial data in Norway, this specific group of companies can provide valuable insights into the emerging trends and challenges of land-based farming. As these companies mature and reach steady-state production, their performance may serve as an indicator of the broader industry’s development in land-based farming projects.

As of 2024, only a few entities have reported successful harvests, and the overall figures in the land-based farming segment remain modest, failing to adequately represent the intended production capacity of these entities. However, we have seen an uptick in investment in companies located in Iceland, Japan and Norway.

We have noted that one company harvested a significant number of salmon on land in Norway in 2024, compared to two companies in 2023. Salmon Evolution (4 891 tonnes) successfully harvested land-based Atlantic salmon. Andfjord Salmon harvested in 2023 (546 tonnes); however, in 2024, they focused on expanding their facilities and thus harvesting was suspended.

Other smaller Norwegian harvesting companies include Bue Salmon, which began harvesting in 2024 and successfully harvested 300 tonnes. Additionally, Gigante Salmon released their first smolt in January 2024 and achieved their first successful harvest in August 2025. In Q3 2025, the land-based trout farmer Hima Seafood completed their first harvest, and their 9,000-tonne facility is expected to be fully operational by October 2025.

Many additional companies have applied for licenses with the Directorate of Fisheries, but there is a significant gap between those that have received a license and those that have initiated construction. Furthermore, even fewer companies have reached operational status. In December 2022, the Norwegian government temporarily suspended the possibility of applying for new land-based aquaculture projects until a new regulatory framework is established.

In July 2025, the Directorate of Fisheries reopened applications for land-based fish farming, introducing clearer regulations regarding the disinfection of intake water and a more defined distinction between land-based and sea-based farming. The suspension of licenses was prompted by a dispute known as the Losna case, in which the state was sued by Losna Seafood over whether the company qualified as land-based or sea-based. Losna Seafood won the case, leading to a suspension of applications until the regulatory framework was reviewed. In the first half of 2025, there were 57 applications submitted, totaling 1.2 million tonnes of production capacity for land-based concessions (including for smolt and post-smolt purposes).

Several Norwegian projects utilize flow-through technology (or hybrid solutions) instead of recirculating aquaculture systems (RAS). This approach leverages sea temperatures and strategically locates facilities near the ocean.

Globally, actual harvest numbers indicate that the ramp-up of production is progressing much more slowly than anticipated a few years ago. However, we are now witnessing an increasing number of large-scale land-based projects that have secured sufficient capital and entered the construction phase. Several companies have also begun placing fish in their tanks for the first time between 2023 and 2025.

Operationally, many facilities have faced significant technical challenges, resulting in fish mortality incidents. It is not always clear whether these are isolated events or indicative of more permanent technological issues. Nevertheless, such failures often provide valuable learning experiences that may help mitigate the risk of similar incidents in the future. Additionally, lower-than-expected average slaughter weights have led to reduced prices for some companies, further straining their financial results.

# Distribution

## About the segment

The distribution segment includes companies offering services within the following subsegments:

- Trading
- Slaughtering
- Sea transportation

The trading subsegment accounts for 90%-95% of the segment’s revenue, and as a result, the overall performance of the segment is closely linked to the development of this subsegment. The dynamics of trading are influenced by the volume and price of fish sold.

In 2016, the segment revenue saw a significant increase, driven by two factors: 1) Mowi’s demerger of its trading business into a separate legal entity, and 2) a sharp increase in salmon prices. Since then, salmon prices have continued to rise year on year, with only a few exceptions.

The year 2020 posed a challenge for exports due to the COVID-19 pandemic’s impact on the HoReCa sector, resulting in lower prices and a 3% export value decline from the previous year. However, the resilience of the sector was evident in the recovery that followed. By 2021, the total export value of Norwegian salmonids had rebounded, increasing by 15% to NOK 85 billion. This was driven by rising salmon prices and a weaker NOK relative to the EUR, which benefited exporters.

The upward trend continued into 2022, with the year setting new records in export values due to higher prices. By 2023, the export value had climbed even further to NOK 128 billion, highlighting the sustained demand for Norwegian salmon. The industry’s robust performance in 2023 confirms the continued high demand for Norwegian salmon.

Transportation on sea has experienced tremendous growth over the last decade. In 2023, the EBITDA margin for this subsegment

increased compared to 2022, driven by a high level of activity and increased rates. This subsegment continues to perform well with both increased revenues and margins, despite the introduction of the resource tax and a sharp rise in construction costs, which caused several well-boat companies to pause new investments.

The distribution segment experienced its highest ROCE since 2017, mainly driven by a significant increase in EBIT from the trading and sea transportation subsegments. The increase in ROCE for the sea transportation subsegment was driven by higher activity levels and escalating fuel costs, which, combined with inflation and higher interest rates, led to increased spot prices in 2023.

Key financials

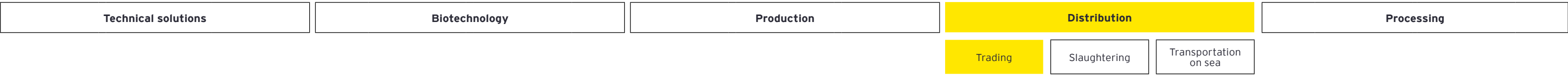


Norwegian salmon and trout exports



Source: Directorate of Fisheries





Trading companies

Norwegian-registered trading companies for farmed salmon and trout comprise independent trading companies and those owned by salmon producers, which have set up separate entities for this purpose. However, trading companies that are integrated with their production activities are not considered part of this subsegment. These trading companies play a vital role in the aquaculture industry, facilitating the global sale and distribution of farmed salmon and trout product.

Market dynamics in 2024

Revenue in the trading segment is primarily driven by fish volumes and achieved prices. Following the sharp recovery in 2023, market conditions in 2024 remained broadly stable, with price levels and traded volumes largely unchanged from the prior year. Consequently, segment revenue was flat at NOK 147.9b (-0.1% YoY).

This lack of top-line growth should be viewed in the context of exceptionally strong years in 2022 and 2023, when revenue grew by ~20% annually, supported by rising salmon prices and favorable currency effects. By comparison, 2024 represents a more normalized year, salmon prices remained strong but without the rapid growth seen previously. An industry player highlighted biological challenges as a key headwind in 2024. Specifically, jellyfish attacks in late 2023 and early 2024 negatively impacted fish health, leading to lower harvest volumes than initially guided.

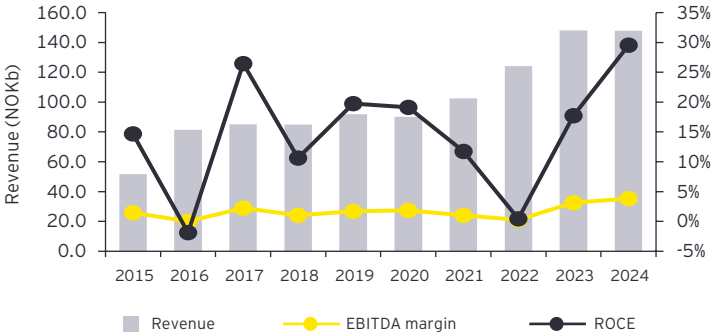
The trading subsegment is traditionally low margin, with sales conducted through spot markets and fixed-price contracts. With prices and volumes stable year over year, trading performance held steady, while margins improved modestly. EBITDA rose to

NOK 5.68b, lifting the EBITDA margin to 3.8% (2023: 3.2%). One key player reported that 37% of their volume was sold under fixed-price contracts in 2024, and these contracts achieved slightly higher average prices than spot sales, likely contributing to the positive margin development across trading companies.

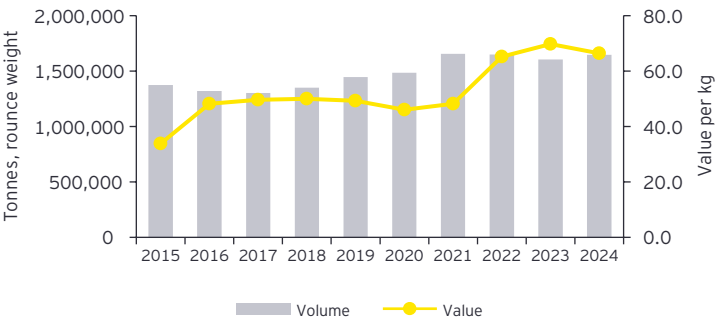
Norwegian exports

The majority of Norwegian-produced salmonids are exported, with Europe remaining the largest export market. In 2024, the export pattern was broadly consistent with 2023, with destination mix and overall volumes largely unchanged. Combined with price levels similar to 2023, these factors underpinned a stable export and trading backdrop for the year.

Key financials²

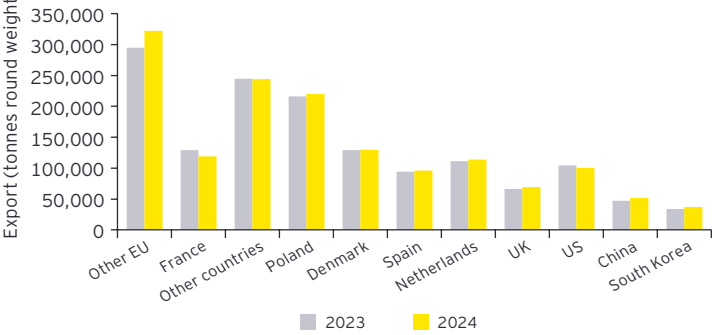


Sold volumes of slaughtered fish (round weight)



Source: Directorate of Fisheries

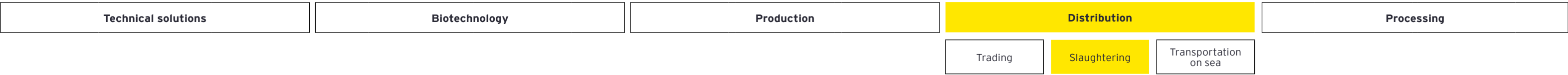
Export markets for salmon (volume)



Source: Directorate of Fisheries



1. “Nøkkeltall fra norsk havbruksnæring 2023”, Directorate of Fisheries  
2. Please note that the large increase in revenue from 2015 to 2016 was partly driven by the fact that Mowi separated their trading business into a separate company (previously integrated with the production company)



Slaughtering companies

This subsegment consists of companies providing slaughtering services, either as independent suppliers or as part of integrated salmon value chains. The analysis includes only businesses organized as separate legal entities, which means the total size of the subsegment may be underestimated. While efforts have been made to distinguish slaughtering companies (primary processing) from processing companies (secondary or value-added processing), some businesses operate across both activities and may also engage in trading.

Growth and market dynamics in 2024

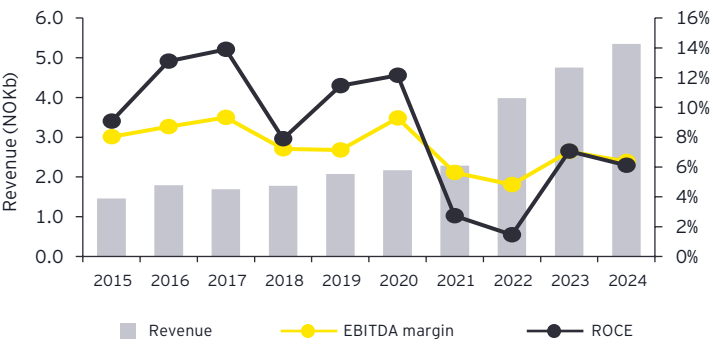
Revenue in the slaughtering subsegment is primarily driven by harvested volumes and achieved prices. In 2024, revenue reached approximately NOK 5.4b, up 12.5% from 2023. A factor contributing to revenue growth in 2024 was the increase in the number of slaughterhouses, rising from 94 to 100. This added capacity likely enabled more domestic processing, despite only modest growth in harvested volumes. For instance, we have observed that some revenue growth has been driven by slaughtering companies expanding into filleting operations, meaning that some of the companies in this subsegment are likely to be reclassified to processing going forward. This demonstrates that, even with stable harvesting volumes, Norwegian slaughtering companies can increase revenue by carrying out a larger share of processing domestically or by expanding beyond slaughtering into processing activities.

Total EBITDA increased to NOK 341m, while the margin declined slightly to 6.4% from 7.0% in 2023. Despite the margin contraction, absolute EBITDA remained strong. The segment’s financial performance continues to be influenced by a few large players. Excluding the largest company, the segment achieved an EBITDA margin of ~11% in 2024, confirming that many slaughtering companies were able to maintain strong profitability.

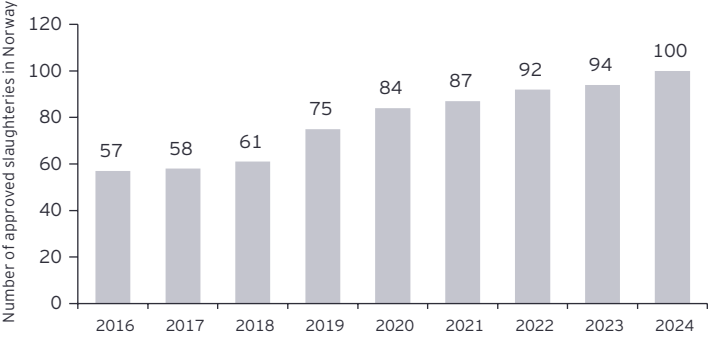
Technological investments and industry trends

The number of slaughterhouses grew from 94 in 2023 to 100 in 2024, showing continued investment in infrastructure. Companies are building larger and more advanced facilities to improve capacity, efficiency and profitability. Modern plants along the Norwegian coast now use technologies such as better pumping systems, electric stunning and improved chilling. One example is Nova Sea’s new plant at Lovund, planned to open in spring 2026. It represents an investment of over NOK 2b and will have a capacity of 100,000 tonnes of salmon per year. The project includes a complete factory management system covering processing equipment, support systems, automation, maintenance and administrative tools.

Key financials



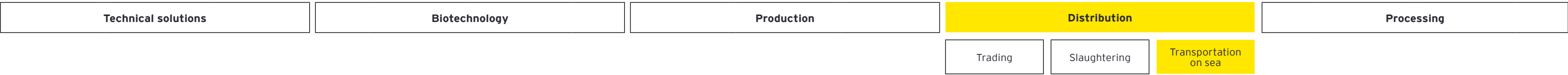
Number of approved harvesting plants in Norway



Source: Directorate of Fisheries



1: Norges Sjømatråd; <https://www.seafood.no/aktuelt/nyheter/2024-ble-tidenes-beste-ar-for-norsk-sjomateksport/>  
2. Ilaks; <https://ilaks.no/denne-fabrikken-skal-dimensjoneres-for-a-kunne-behandle-200-laks-i-minuttet/>  
3. Sotra fiskeindustri financial statement 2024



Transportation on sea

This subsegment primarily consists of well-boat companies responsible for transporting smolt to sea farms and live salmon and trout from farming cages to harvesting or processing plants or slaughterhouses. Additionally, it includes companies that handle freight for feed, processing vessels and service vessels. Many of these companies also provide sea lice and amoebic gill disease (AGD) treatment on board well-boats, along with services such as transportation, sorting and fish counting.

Due to high barriers to entry – such as the significant capital investment required, specialized equipment and the operational expertise needed to handle live fish – the subsegment is dominated by a few key players. In 2024, the five largest companies accounted for approximately 51% of the subsegment’s revenue and 59% of its EBITDA. These figures increase further when considering all legal entities within the same corporate groups as the top five.

Increased EBITDA margins despite higher costs

Sea transportation has experienced tremendous growth over the last decade. This subsegment has thrived due to biological challenges in the production segment. A significant portion of revenue growth has stemmed from the increased treatment of AGD and sea lice, greater production growth, larger post-smolt and the need to secure full-time well-boat access, as capacity shortages pose a substantial risk to profitability.

This has contributed to consistently high EBITDA margins of approximately 40% in this subsegment, despite observed margin declines in both 2019 and 2022. The drop in EBITDA margin in 2019 is misleading, as positive EBITDA contributions in 2018 from vessel sales in several entities created an inflated baseline. However, we observe that the margin from the bottom in 2022 has increased significantly and is back at the 2015-2017 levels of over 40%.

When isolating well-boats and adjusting for the impact of vessel sales, we observe relatively stable EBITDA margins from 2015 to 2024, ranging between approximately 40% and 45%, except for a notable decline in 2022 when margins dropped to 39% – a level not seen in the subsegment since before 2015. Much of this decline is attributable to a significant rise in fuel costs in 2022, flagged by several entities as a contributing factor. In 2024, margins continue to increase due to higher rates in both the spot market and frame agreements.

Firms involved in feed transportation reported lower EBITDA margins from 2019 to 2024 compared to earlier periods. Margins dropped considerably from over 30% in 2018 to 23%-24% during 2019-2021, dipping further to below 20% in 2022. In 2023, margins rebounded to 22%, and in 2024, the trend continues with a margin of 23%. Similar to the well-boat industry, the decline in 2022 EBITDA margins was largely attributed to rising fuel costs. Combined with inflation and higher interest rates, these factors increased spot prices, resulting in higher revenues and margins in 2024.

Processing vessels represent a growing venture within aquaculture, with most growth in this subsegment driven by the addition of new vessels. For processing vessels, EBITDA margins increased to 50% in 2024, compared to a stable margin of approximately 40% in recent years.

Lower investment willingness

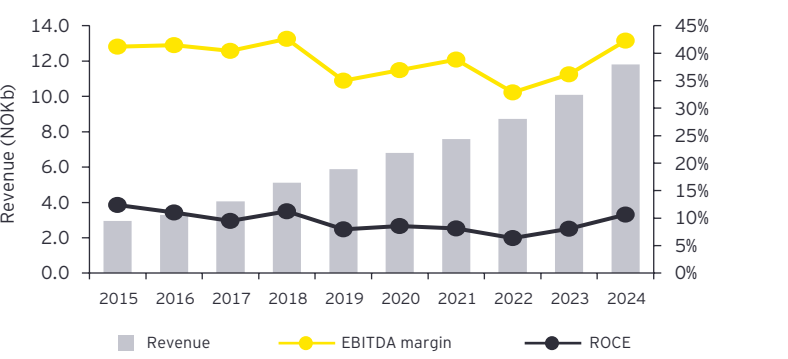
Investment appetite continues to remain low since 2023 due to resource tax, rising construction costs, weaker NOK and higher interest rates. Market feedback indicates that contracting of new well-boats to stay low in 2025, continuing the subdued trend from 2024. Despite some deliveries, the well-boat fleet grew by only one vessel year-on-year, indicating that some vessels have been transferred out of the market.

Increased consolidation and acquisition activity

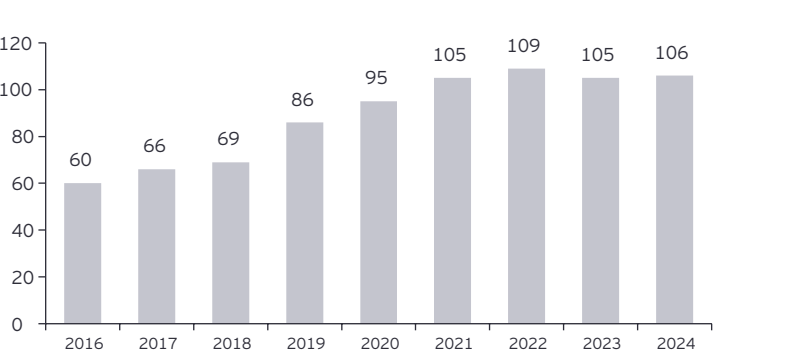
The subsegment experienced several transactions in 2024, and we expect this trend to continue given the strong M&A appetite for companies within this sector. This includes both industry consolidations and multiple acquisitions by foreign financial investors.

We have also observed SMBs and family-owned businesses collaborating to invest in well-boats for joint use and enhanced operational flexibility. However, we anticipate a decline in this trend as construction costs and the technical requirements onboard ships have increased significantly in recent years.

Key financials



Number of well-boats



Source: Directorate of Fisheries, Kystrederiene

# Processing

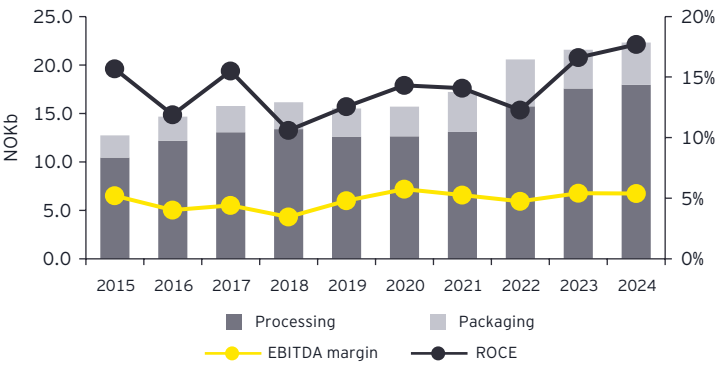
## About the segment

The processing segment consists of businesses that primarily engage in offering services related to secondary processing, in addition to those involved in the production of diverse types of packaging.

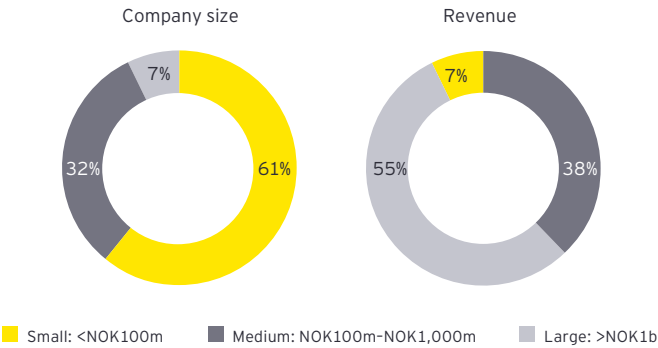
We have divided the segment into two subsegments:

- Processing
- Packaging

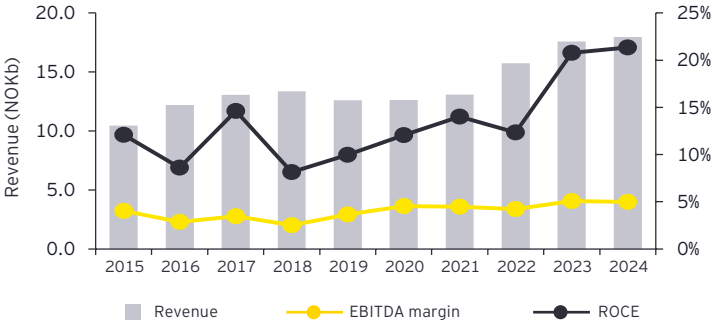
### Key financials



### Segment composition (2024)



Key financials



Processing

For the purpose of this report, we distinguish between primary and secondary processing. Primary processing refers to slaughtering and gutting, while secondary processing includes filleting, fillet trimming, portioning, smoking and similar activities. In this section, we focus on secondary processing, as primary processing is primarily covered under the slaughtering subsegment. Secondary processing results in products typically referred to as value-added products (VAP).

Processing is performed both by independent entities and by salmon producers as part of their value chain. However, our analysis includes only separate legal Norwegian entities, which underestimates the total size of the subsegment. Additionally, the majority (approximately 80%) of Norwegian salmon is exported for further processing.

Processing margins stabilize after years of growth

After several years of gradual improvement, processing margins appear to have stabilized in 2024 and early 2025. EBITDA margins remain close to the 5% level achieved last year, supported by operational efficiency measures and selective investments in automation. While revenue growth in 2024 was modest compared to previous years, it was primarily driven by continued high raw material prices and favorable currency effects rather than volume expansion. However, the pace of margin improvement has slowed, reflecting persistent cost pressures across the value chain.



Balancing costs and competitiveness in processing

The subsegment continues to face structural challenges: volatile raw material prices, rising labor costs, and increased energy and logistics expenses. Processing remains labor-intensive, and Norway’s high wage environment limits competitiveness for large-scale value-added processing. Consequently, approximately 80% of Norwegian salmonids are still exported for further processing abroad, maintaining the long-standing pattern of Norway acting primarily as a raw material supplier.

Despite these constraints, there is a clear trend toward incremental capacity upgrades and modernization of existing facilities within Norway. Investments are focused on improving efficiency, reducing waste, and meeting stricter ESG and transparency requirements. While the proportion of domestic processing has not significantly increased, the industry is laying groundwork for gradual expansion of value-added activities, supported by political ambitions and sustainability goals.

For several years, Norway has maintained a political ambition to increase the share of value-added processing conducted within the country. Progress toward this goal has been slow, as structural cost challenges and global supply chain dynamics continue to favor overseas processing.

Rather than large-scale relocation of activities, recent efforts have centered on targeted investments in technology and sustainability measures to strengthen competitiveness. These initiatives aim to improve efficiency and reduce environmental impact, aligning with stricter ESG requirements and long-term industry goals.

Looking ahead, the success of domestic value-added processing will hinge on balancing Norway’s high labor costs with automation and innovation. While change is gradual, these steps signal a strategic commitment to enhancing Norway’s role beyond raw material supply.



### Packaging

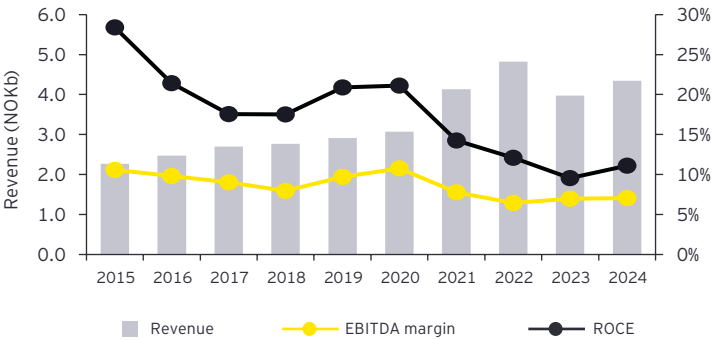
The packaging subsegment includes a range of small to medium-sized enterprises that produce and distribute diverse packaging materials and casings, primarily for fish and feed. While these companies primarily cater to the aquaculture sector, many also serve other industries. Additionally, some firms supply goods to the aquaculture sector, but their revenue from this market may be insufficient for inclusion in our evaluation. Consequently, the reported data for the packaging segment may be somewhat understated.

In 2024, the packaging segment rebounded after the previous year’s slowdown, with several leading companies reporting solid revenue growth. This recovery was supported by strong demand for seafood packaging and strategic acquisitions that expanded production capacity. Despite continued cost pressures from raw materials and energy, profitability remained stable, with an EBITDA margin of 7.1% and a ROCE of 11.1%, indicating efficient operations and improved capital utilization.

Expanded polystyrene (EPS) continues to dominate the subsector, underpinning its critical role in preserving fish quality during transport and storage. The material's insulating properties remain essential for maintaining product freshness, particularly in export markets.

Sustainability has become an even more prominent focus in 2024. Companies are investing in recycling infrastructure and developing circular solutions, such as closed-loop systems for EPS recovery. These initiatives, combined with product innovations like leak-proof fish boxes, signal a clear shift toward environmentally responsible packaging practices. Looking ahead, the segment is expected to benefit from ongoing modernization and the growing emphasis on sustainable operations, even as volatility in energy and raw material prices remains a challenge.

Key financials



# Methodology and definitions

## Inclusion criteria

A company is defined as a Norwegian aquaculture company if both of the following criteria are met:

- At least 50% of its turnover is generated in the aquaculture industry
- Should be a Norwegian-registered legal entity

## Value chain segments

- Technical solutions
- Biotechnology
- Production
- Distribution
- Processing

Each of these categories is further broken down into subsegments to capture the huge diversity within the industry.

## Company size definition

- Large company: revenue above NOK1b
- Medium-size company: revenue between NOK100m and NOK1b
- Small company: revenue below NOK100m

## Methodology

To analyze financial activity across the value chain, we have gathered information from standalone financial statements of individual legal companies. Accounting information is publicly available from the Brønnøysund Register Centre. The number of companies included in the analysis will vary slightly depending on the availability of financial information. For companies operating with divergent financial periods, adjustments have been made to present the data on a calendar-year basis.

Many of the identified companies offer products and services in more than one segment of the value chain. However, in this analysis, each company is linked to only one segment of the value chain based on its main activity. This simplification could result in subsegments being over or understated compared with the actual total. For larger industrial conglomerates with multiple subsidiaries, each entity is allocated to its respective best-fit segment.

The methodology does not capture or eliminate intercompany transactions or revenues in holding companies registered abroad.

Please note that the analysis is limited to the domestic aquaculture industry. Thus, foreign units owned by Norwegian companies are not reflected in the analysis. This may give a somewhat misrepresentative picture, particularly for the companies noted on the Oslo Stock Exchange, as many of them have a substantial part of their business outside Norway.

## Calculations

EBIT: earnings before interest and taxes

EBITDA: earnings before interest, taxes, depreciation and amortization

Capital employed: fixed assets + immaterial assets (ex. licenses) + net working capital

Return on capital employed (ROCE): 
$$\frac{\text{EBIT}}{\text{Capital employed}}$$

CAGR: compound annual growth rate

WFE: whole fish equivalent

HOG: head on gutted

IFRS: International Financial Reporting Standards

R&D: research & development

CCU: carbon capture and utilization

MAB: maximum allowed biomass

pp: percentage points

SMBs: small and medium-sized businesses

COGS: cost of goods sold

RAS: recirculatory aquaculture system



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