



REPORT
GCE BLUE MARITIME 2018 – GLOBAL
PERFORMANCE BENCHMARK

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1. Introduction and main findings

The wind has shifted in Møre. After a tough transformation since the oil-price shock in 2014, the Blue Maritime cluster can finally look forward to increasing activity. The cluster has managed to reorient itself away from its strong dependency on the offshore oil and gas market and the companies are now well-positioned in key growth markets. The orderbooks are increasing, and there are expectations of increasing revenues in all segments.

Still, 2017 was another tough year for the cluster. Valued added continued to fall, and on aggregate, the value creation fell by 14 percent from 2016 to 2017. The reduction in activity was mainly driven by the exit of Farstad and Rem, but value added fell by 8 percent also for the yards. The rest of the cluster (equipment manufacturers and services providers) managed to increase its value added in 2017. The cluster employed 13 300 people at the end of December 2017, which is nine percent fewer than the previous year. Almost one third of the jobs in the cluster have disappeared since 2014. Moreover, for the third consecutive year, the operating profit margin for the cluster is negative. This is driven by poor performance by equipment producers, in particular the industry locomotive Rolls-Royce Marine. Excluding Rolls-Royce Marine, the cluster actually delivered positive margins in 2017. The cluster also managed to stabilize the steep downturn in 2016, and all parts of the cluster report growing revenues in 2018.

Figure 1-1: Overview of development in performance indicators, market situation and opportunities and challenges for the cluster going forward. Source: Menon (2018)¹

Key performance indicators	Market situation	Opportunities and challenges
<p>Activity-level in 2018 will increase:</p> <ul style="list-style-type: none"> • Employment* + 4% • Turnover* + 16% 	<p>The tide in Møre is turning</p> <ul style="list-style-type: none"> • Expectation of increasing revenues in 2019, across all segments. 	<p>Productivity has to increase</p> <ul style="list-style-type: none"> • The cluster needs to regain competitiveness
<p>Profitability low</p> <ul style="list-style-type: none"> • Net operating margin - 1% • Weak profitability in all segments • SMEs perform somewhat better 	<p>The order book value increases</p> <ul style="list-style-type: none"> • On average, the companies have order books that secure 14 months of operation 	<p>Digital readiness</p> <ul style="list-style-type: none"> • Does the cluster have competence, capacity and willingness to succeed with the digital transformation?
<p>Productivity falling</p> <ul style="list-style-type: none"> • Productivity keeps falling • Mainly a function of low profitability 	<p>The cluster has been successful taking positions in growing market</p> <ul style="list-style-type: none"> • A more diversified market focus than ever before 	<p>New ownership creates opportunities?</p> <ul style="list-style-type: none"> • Will the introduction of digital world-leader like Kongsberg Maritime/Rolls Royce Marine create new knowledge spillovers
<p>Competitive analysis</p> <ul style="list-style-type: none"> • Weaker performance against Norwegian benchmark since 2011 • The cluster's shipping segment has lost market shares in the consolidation process 	<p>Questions about the future of the offshore market</p> <ul style="list-style-type: none"> • Oversupply still affects the segment, but signs of increasing investments in 2019. 	<p>The cluster will have to prove profitability in new markets</p> <ul style="list-style-type: none"> • The transition is difficult, but the companies will need to improve profitability

Over the last ten years, the development in the Blue Maritime cluster has been closely correlated with the performance in a benchmark of similar maritime companies. In 2017, however, the cluster was outperformed by

* Estimates made by Menon (2018)

the Norwegian benchmark. The value added continued to fall in the cluster but was stabilized in the benchmark. Moreover, the gap in productivity between the cluster and the benchmark increased to an all-time high.


At a segment level, the shipping companies are struggling as the fleet is significantly smaller with both Farstad and Rem exiting the cluster in 2017. Shipping companies in Møre also experienced a higher share of laid-up vessels than both the national and global average. They are also in a difficult financial position with a high level of debt and financial costs.


Møre and Romsdal remains the most important area in Norway for shipbuilding activities. Nevertheless, the yards have been through a tough year. Demand for new offshore vessels has been close to non-existing for the last three years, and the market is still characterized by oversupply. The yards are in a distressed financial situation with high debt and continued negative profitability. On the other hand, they have shown an incredible restructuring ability, and are now building up orderbooks in the ferry and exploration cruise segments. Thus, a crucial year is ahead for the yards as they need to re-gain profitability.


For the equipment manufacturers, the large companies continued to struggle with low profitability, while the SMEs delivered good results. The service segment, headed by design companies and technological engineering, represents the most stable and profitable segment of the cluster, and is an important sales engine for the whole cluster.

Møre is well-positioned in key growth markets

2018 will be a year of growing activity and revenues for the cluster. The combined orderbook for the cluster has grown by more than six months in a year and now ensures 14 months of operations. Moreover, the cluster companies expect to hire at least 1 000 new employees in the coming two years, and across all segments, the companies expect profitability to improve. Three markets look particularly interesting for the cluster:

 Ferry and exploration cruise

 Fishery and aquaculture

 Offshore wind

Møre is well-positioned in these key growth markets. The four big yards have taken important positions in the growing ferry and exploration cruise market. Offshore wind is a market segment the companies expect to be more important in the coming years. The fishery and aquaculture segments have been thriving, with high profitability and good market conditions, but market analytics have raised questions about whether this will continue.

There is uncertainty about how the offshore market will develop. It does seem like investments bottomed out in 2017, and current estimates from the oil companies suggest an increase in investments by 6 percent from 2018 to 2019. Moreover, according to our survey, 4 out of 10 companies believe that oil and gas will be more important for their business. However, the segment is affected by oversupply. A high share of the OSV-fleet is currently laid up and relatively few vessels have been scrapped. Moreover, the contracting level of new vessels is low. The outlook is therefore uncertain.

1.1. Key questions going forward

The cluster has historically demonstrated a remarkable capability for strategic transformation through both company- and cluster-based innovation. However, there are important questions about future competitiveness that will influence the development in the coming years:



Productivity has been lower than in other parts of the maritime industry in Norway: Is this caused by learning and restructuring costs connected to the rapid transformation of the ocean industry? If so, will the cluster's productivity catch up with competitors in 2018 and 2019?



The transformation of the ocean industry shown by the cluster companies has been impressive but has come at a cost. The cluster has experienced negative or low profitability for three consecutive years, and many companies are in a distressed financial situation. This is both risky and limits flexibility going forward. A key question for the next year is whether and when the cluster can become profitable again.



The ongoing digital transformation will demand strategic investments in new competence. An important question is whether the maritime industry has the right competence culture to change to exploit these megatrends in order to retain and increase competitiveness.



With the Kongsberg/Rolls-Royce Marine acquisition, the cluster will obtain world-leading expertise in this area, but do the remaining cluster companies have the competence to utilize the knowledge spillovers from the new digital locomotive?

One way of increasing productivity and develop new competency and products is through closer cooperation between companies in the region. In late 2017, the new Blue Ocean Innovation Arena opened in Ålesund. This 800 m² area includes a virtual reality lab and a start-up lab for new companies and entrepreneurs. In June 2018, the center was awarded status as a Catapult Centre and named DigiCat Norwegian Catapult Centre. DigiCat will be a national center for simulation, digital twins and virtual prototyping. Such centers are important to address the challenges mentioned above and to develop new companies, competency and products.

1.2. The Blue Maritime cluster in Møre is a leading ocean-based cluster

GCE Blue Maritime is one of three Global Centers of Expertise in Norway – the highest level in the hierarchy of Norwegian Innovation Clusters. To become a GCE, a cluster must prove that it has established a systematic collaboration between the participating companies, a collaboration characterized by dynamic relations with innovative power. The GCE-clusters must also be considered to have a strong potential for growth in national and international markets and together form a strong innovation system.

The Blue Maritime cluster was originally a tight vertically structured cluster, with world-leading designers, equipment manufacturers, yards, shipping companies and other specialized service providers. The companies in the cluster are world-leading in all the parts of the value system. Companies such as Skipsteknisk, Ulstein Design, Havyard Design and Marine Teknisk design the world's most advanced offshore vessels that perform different operations in some of the most challenging environments at sea. The shipping companies, including Bourbon, Island, Havila and Olympic, operate the ships serving the offshore fields across the globe and control a fleet that is young, advanced and equipped with world-leading equipment. The vast majority of the ships are produced by local shipyards such as Kleven, Vard and Havyard. The yards in turn use equipment – motors, propulsion, winches, dynamic positioning, etc. – produced locally by Rolls-Royce Marine, IP Huse and Brunvoll, all located in the

cluster. However, from 2015 onwards there were no new orders for offshore service vessels. This implied that market relations and innovation impulses from the shipping companies to the rest of the cluster were cut off, thus weakening the internal linkages in the cluster. Currently, the cluster must reinvent itself, with new value chains and linkages. Based on historical evidence, there is reason to believe that the Blue Maritime cluster will succeed in this effort.

In the remainder of this report, we will divide the

Figure 1-2: The four segments in the cluster with company illustrations

cluster into four separate segments: Shipping companies, yards, equipment manufacturers and other specialized services. Since the designers play a crucial role in the product innovation in the cluster, we will also present some separate numbers for this group, but they will mainly be included in the group with companies offering specialized services. A selection of the leading companies within the four areas is shown in the figure to illustrate the width of activities in the cluster.



2. Key developments in the Blue Maritime cluster

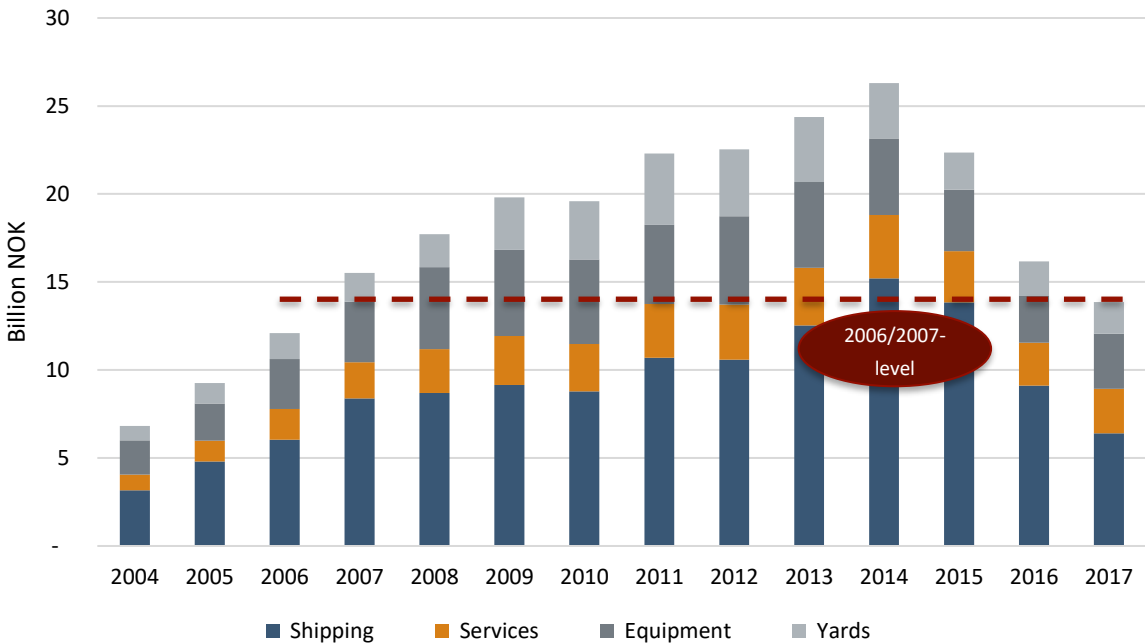
2017 was another tough year for the cluster. Valued added continued to fall, and value creation decreased by almost 15 percent from 2016 to 2017. However, the reduction in activity was mainly driven by the exit of Farstad and Rem and weak markets for offshore shipping. The rest of the cluster (yards, equipment and services) managed to increase its value added in 2017. The cluster employed 13 300 people at the end of December 2017, which is 9 percent less than last year’s figure. Almost 30 percent of the jobs in the cluster have disappeared since 2014. For the third consecutive year, the operating profit margin for the cluster is negative. This is driven by poor performance by equipment producers, in particular the industry locomotive Rolls-Royce Marine. But there are positive signs as well. The steep downturn in 2016 was stabilized in 2017, and all segments report growing revenues in 2018. Moreover, while productivity continued to fall in 2017, wage costs are also coming down, making way for increased competitiveness.

2.1. Activity stabilizes – value added back to 2006-level

From 2004 to 2014, the cluster increased its value added by almost 400 percent, increasing from around NOK 7 billion to more than 26 billion. The cluster grew as the companies managed to land contracts for building, equipping and operating mainly offshore vessels for the oil and gas industry.

From June to December 2014, the price of crude oil fell from over USD 110 to USD 50 per barrel, which sent shock-waves through the Norwegian economy. Due to its strong dependency on the oil and gas industry, the Blue Maritime cluster was severely hit by the following downturn in activity. Overcapacity in the market for offshore vessels meant that shipping companies began an intense battle for contracts. Margins fell quickly in tandem with significantly lower investments in new vessels. That sent ripple effects upstream in the value chain, affecting the yards, equipment producers and service providers. The value added has declined since the peak in 2014 and continued along the same downward-pointing trajectory in 2017.

Figure 2-1: Development in value creation in the cluster from 2004 to 2017. Source: Menon (2018)



The combined value added of the cluster in 2017 was NOK 13.9 billion. The activity level has not been this low since 2006. Activity is down 14 percent from 2016. The Møre cluster now creates only half of the value added in 2014. This development is driven by the shipping segment, which has experienced extraordinarily tough market conditions. The value added within the shipping industry has been reduced with 58 percent since 2014.

The negative development from 2016 to 2017, however, is driven entirely by the exit of Farstad and Rem, with a combined value added of NOK 1.7 billion in 2017. Without Farstad and Rem, the activity level in the cluster is stable. This is positive news for the cluster.

Box 2-1: Description of value added

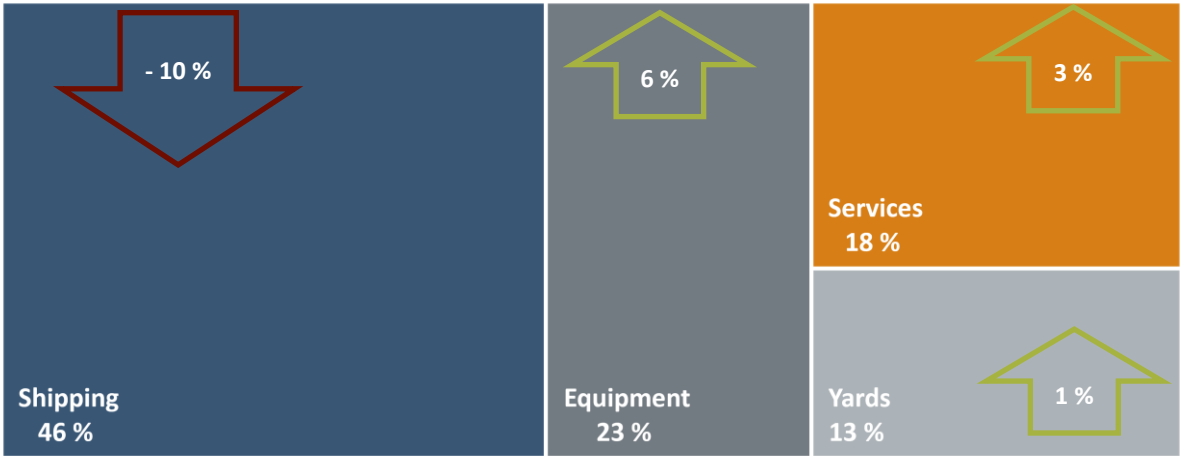
Value added

Value added is often used as a measure of activity. Value added is a company’s purchases of goods and services deducted from its turnover. Value added is found in the accounts as the sum of EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) and wage costs. This measure has some key advantages others lack. It avoids double-counting purchases of goods and services, making the measure comparable across sectors. This is important in a cluster such as Blue Maritime where there is a high degree of internal sales. In addition, it can be used to measure the economic contribution or return from the sector to the national economy. This is possible because the measure shows how much is left for the key stakeholders in the industry, meaning employees through wages, government through taxes, creditors through interest payments on loans, and owners through profits.

The downturn in shipping makes equipment and services relatively more important segments

The downturn in shipping significantly affects the dynamics within the cluster. Shipping is still the largest segment in the cluster. However, its share of the total value added is reduced by 10 percentage points from 2016. For the first time since 2012, the shipping industry is contributing less than half of the value added in the cluster.

Figure 2-2: The four segments’ share of value creation in the Møre cluster. Source: Menon (2018)

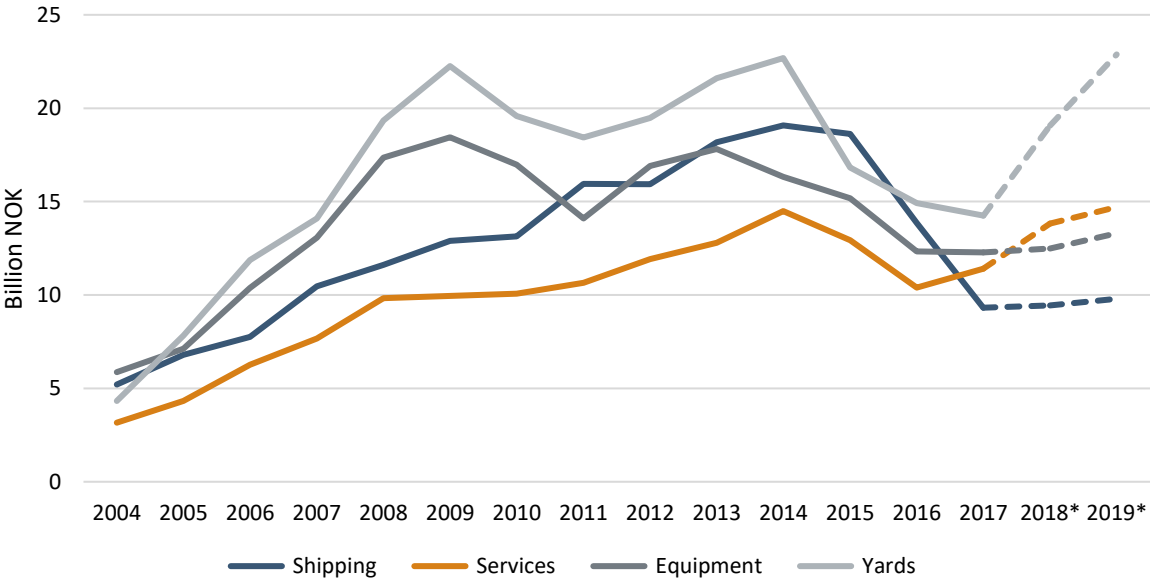


When shipping becomes less important, other segments are becoming relatively more important for the cluster. Equipment producers and services were the two segments that experienced growth in 2017. The equipment producers saw value added increase with 18 percent, from NOK 2.6 billion in 2016 to NOK 3.1 billion in 2017. The increase in services was lower, but still significant, with value added increasing by four percent.

2.2. The downturn is over – the cluster is positioning for increasing revenues

Another measure of activity is the companies’ revenues. In 2017, revenues fell by 8 percent compared to 2016, which took the total revenue of the cluster to NOK 47.2 billion. For the first time since 2007, the combined revenues of the cluster amounted to less than NOK 50 billion. However, the cluster is positioned for growth in 2018, with expectations for increasing revenues in all four segments.

Figure 2-3: Development in revenues broken down on the four segments. Source: Menon (2018)



As we can see from the figure above, the history of revenues for the cluster companies can be separated into four different time periods:

- 2004 – 2009: High growth in all segments
- 2010 – 2014: Volatile growth
- 2014 – 2017: Sharp decline
- 2018 → Cautious optimism, and growth in several ocean industry markets

The first period from 2004 to the outbreak of the financial crisis represents a story of incredible growth and high performance. The revenues of the cluster increased more than three-fold, across all segments.

In terms of revenues, the financial crisis was a tough blow for the yards, and therefore also the equipment producers. The activity and revenues fell sharply until 2011 when demand from the offshore industry began to increase. The demand growth was particularly strong for specialized offshore vessels. For the shipping companies and service segment, this period represented another period of high growth. The revenues of the shipping companies for instance increased by 45 percent from 2010 to 2014, an annual growth rate of almost 10 percent.

From 2014 to 2016, revenues fell with more than NOK 20 billion. On an aggregate level, the negative trend slowed down in 2017, but revenues fell nonetheless by NOK 4.2 billion from 2016.

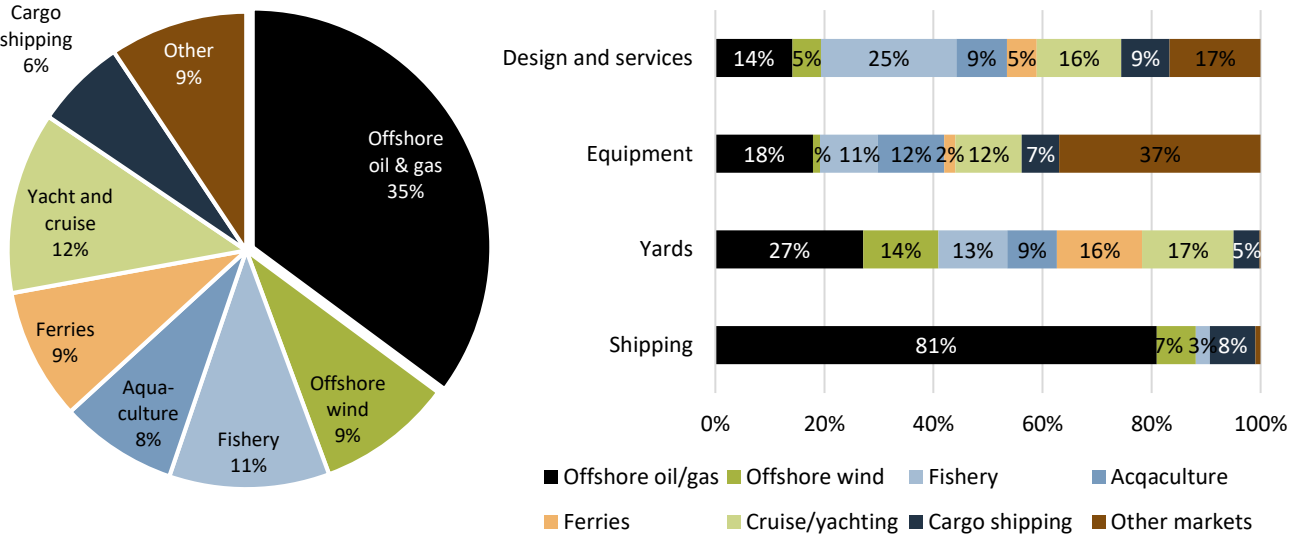
2017 represented a turning point for the cluster. In our survey, the cluster companies were asked to report the expected revenues in 2018 and 2019.² The results are clear: All segments expect higher revenues in 2018 and 2019. This is particularly true for the yards, with an expected annual growth of more than 20 percent in 2018 and 2019.

The market focus is shifting from offshore oil and gas towards other ocean industries

In the same survey, the companies were asked to distribute their revenues on various ocean industries and land-based markets.³

For the cluster combined, the oil and gas market constitutes 35 percent of the aggregated market, decreasing from 50 percent in 2017. We do not have corresponding numbers from earlier years, but presumably, the share of the oil and gas market has declined heavily since 2014. For the shipping companies⁴, the proportion is still high, 81 percent, but for the yards, equipment manufacturers, design companies and other services the proportion is 30 percent or lower.

Figure 2-4: Left: Distribution of the cluster’s combined revenues on different ocean and land-based markets. Right: The cluster’s turnover broken down on the four segments and split by markets. Source: Norsk Industri / Menon (2018)



Yacht and cruise, as well as the fishing industry⁵, constitute the second and third largest market, with relatively equal revenues in all market segments – except for traditional shipping (deep- and shortsea) – of 6 percent.

² See appendix for more information about the survey.
³ The calculations are based on reported shares of 57 percent of the total revenue of the cluster.
⁴ We do not include shipping companies with integrated fishing activities. This since the income in these companies mainly are attributed to income from selling seafood products and not to pure ship ownership or shipping activities.
⁵ It is important to emphasize that the fishing fleet is not included in the numbers, only design, equipment and building of fishing vessels.

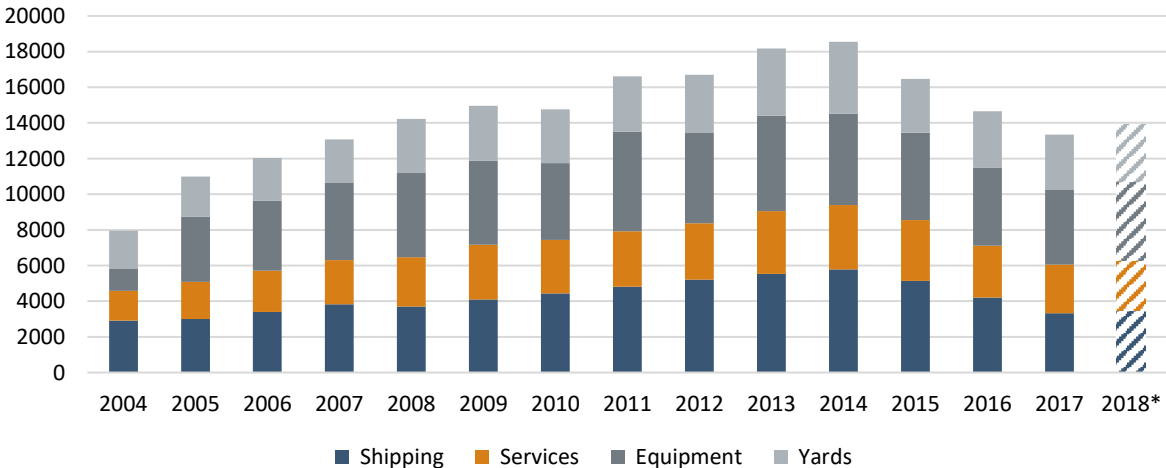
It is also interesting to analyze the relative importance of different segments for the cluster combined against the average companies. The revenues from oil and gas, offshore wind and ferries are more important for the combined revenues than for the average company, indicating that these markets are more important for bigger firms. The opposite is true for the “Other”-category, which should be interpreted as the land-based markets.

From 2017 to 2018, the share of ferries and yacht/cruise has grown significantly. Measured in both aggregated shares and the average company’s shares, the two passenger segments have increased from a respective 8 and 8 percent to 12 and 21 percent respectively. Fishery and aquaculture are increasingly important for the cluster, but the growth in these segments is somewhat smaller than for the passenger segment.

2.3. Almost thirty percent of the workforce has left the cluster since 2014

In 2017, the negative trend in employment continued for the Blue Maritime cluster. 13 300 people were employed by the cluster companies in 2017. This represents a reduction of nine percent or 1 300 employees since 2016.

Figure 2-5: Development in employment in the Blue Maritime cluster broken down on the four segments. Source: Menon (2018)



Since 2014, more than 5 300 people have seen their jobs disappear, which represents a 28 percent fall in employment since the top in 2014.

The reduction in employment is particularly visible for the equipment manufacturers and for the shipping companies. For the equipment manufacturers, the poor performance was driven by the main industry locomotive, Rolls-Royce Marine. More than 500 people have lost their jobs in Rolls-Royce and Bergen Engines alone. Taking these companies out, the rest of the equipment producers are experiencing a more stable development. The reduction for the shipping companies can almost entirely be explained by the Farstad and Rem exit, which together employed 450 people in 2016. Services and yards have experienced less reduction in employment than the other two segments.

In the beginning of 2018, employment seems to have stabilized around 13 200. Our estimates, based on the companies’ own reporting, suggest that employment in the cluster will increase by 4.5 percent during 2018 – from 13 300 to 13 900. In 2019, however, employment in all sectors is expected to increase. Nearly 6 out of 10

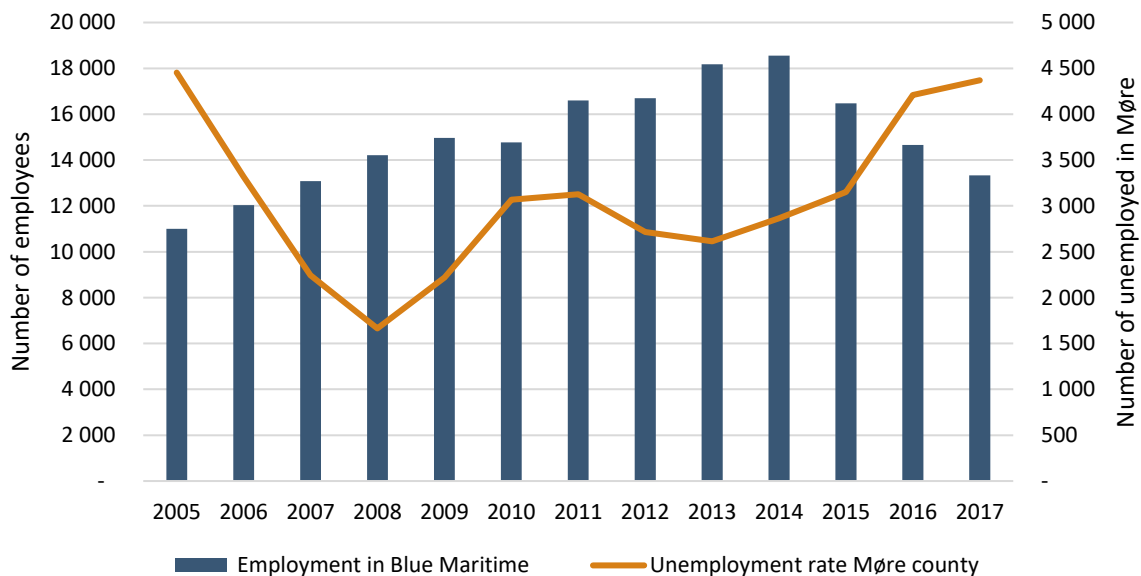
companies expect an increase in the labor force, while only 1 out of 20 expects a decrease. Our estimates suggest an increase of more than 1000 employees in 2019 from the 2017-level.

Blue Maritime is driving the labor market in Møre

The Blue Maritime cluster is a vital part of the labor market in Møre and Romsdal county. With world-class producers and service providers in all parts of the maritime value chain, the cluster employs highly skilled professionals. The development in the cluster is therefore of great importance for Møre county as a whole. Because the cluster employs a large share of the population in Møre, changes in the cluster’s employment rate have a direct impact on the unemployment rate for the county.

In the peak year of 2014, the Blue Maritime cluster employed 23 percent of private sector employees in Møre county. After three difficult years for the cluster companies, this share fell by 7 percentage points to 16 percent in 2017.

Figure 2-6: The development in employment in the cluster (left) and unemployment rates in Møre county (right). Source: Menon (2018) and NAV (2018)



In the figure above, we combine the development in employment in the Blue Maritime cluster and the registered unemployment rate in Møre county. It is clear how the two graphs affect each other inversely: when employment in the cluster is rising, the unemployment rate is lower, and vice versa. The correlation between the cluster employment and unemployment in Møre is 0,48, meaning that a 100 percent increase in employment goes along with a 48 percent reduction in unemployment. While this does not measure the causality of changes in the employment in the cluster on unemployment rates in Møre, it suggests that there is a clear connection between the two. This shows us how vital the cluster is for the labor market and the economy in Møre.

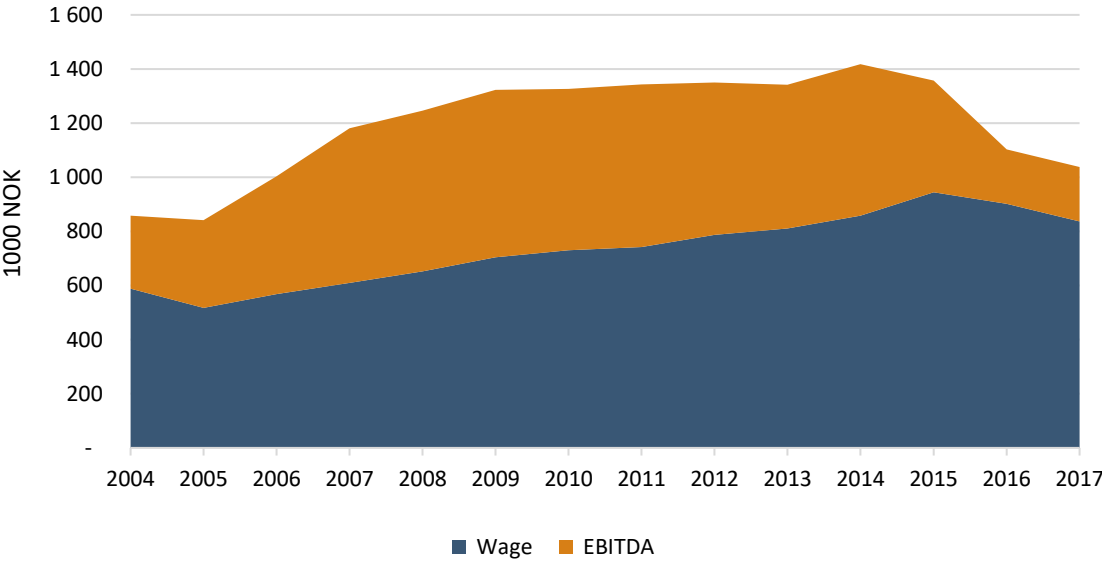
2.4. The cluster is taking measures to increase competitiveness by reducing cost

An important feature of the Blue Maritime cluster has been the tightly integrated value chain, with world-class companies in each step of the chain. To maintain the international competitiveness, the companies have been innovation-driven and focused on improving productivity.

Productivity in the cluster, measured as value added per employee, grew rapidly from 2004 to 2009. Since 2009, however, value added per employee has stagnated – suggesting that productivity growth in the cluster has declined. On the cluster level, the productivity is down to NOK 1 million per employee in 2017, down 6 percent from last year. This suggests that competitiveness of the cluster is challenged.

One benefit of using value added as a proxy for productivity is that we can decompose value added into a wage component and an operating profitability (EBITDA) component. Wages per employee increased continuously from 2005 to 2015, increasing the average wage by more than 80 percent over the period. While increases in wage indicate increased productivity, we also know that wages are «sticky», making it harder to reduce costs.

Figure 2-7: Value added per employee broken down to wages and EBITDA. Source: Menon (2018)



In 2015, we observe that the wage per employee started to come down. This suggests that the efforts to reduce costs have succeeded. Two factors can explain that wages per employee have declined. From studies of recessions, it is known that it is hard to reduce employees’ wages. Therefore, we can assume that part of the decline is explained by the fact that the people who lost their jobs in the downturn had high wages. For instance, many officers in the shipping segment had significantly higher wages than average, which contributed to a higher wage level. Another important reason is that many employees have performance-related wages. Generally, in a time with poor performance, one should expect these bonuses to be substantially lower as well.

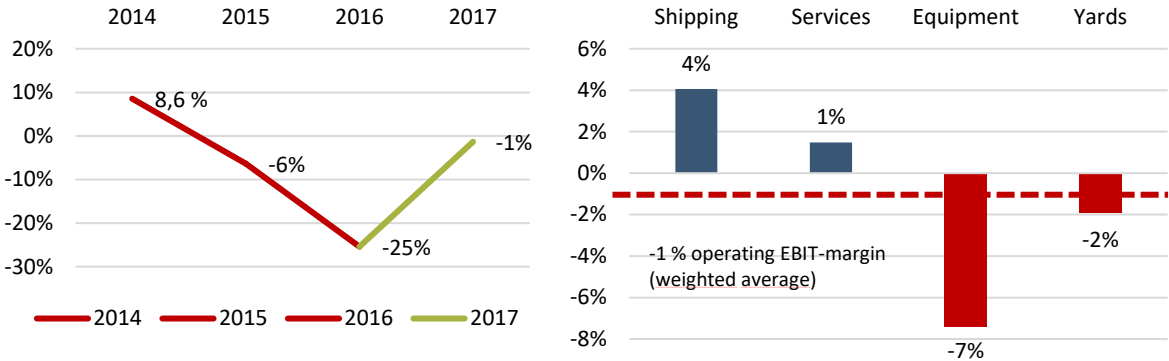
The next point is that the EBITDA-share of the value added decreased significantly after 2014. From 2006 to 2014, the EBITDA-share was around 40 percent, but in 2016 and 2017, the share fell below 20 percent. This share is too low as it limits flexibility and increases risk. On the brighter side, however, the EBITDA-share increased slightly from 2016 to 2017, indicating that the competitiveness of the cluster is on the right track.

2.5. The cluster is still struggling with negative profitability

Operating in a global market, companies in Møre face competition from countries with lower costs. To be competitive, the cluster must deliver goods and services that have a higher relationship between quality and cost than competitors. Profit margins can be interpreted as an indicator of the cluster’s ability to leverage its

capabilities and deliver goods and services that are valued higher than its input factors. In other words: as an indicator of how competitive the cluster is. It is important to mention that there are also other factors such as market orientation and temporary supply shocks that can explain periods of deviations in profitability.

Figure 2-8: Left: Net operating margins (EBIT) for the cluster in total. 2004-2016. Right: Net operating margins (EBIT) at segment level in 2016. Source: Menon (2018)



The combined operating margin in the cluster grew rapidly to a peak of 10-12 percent in 2006-2011. Even after the financial crisis, profitability remained high through 2014. In 2015, the aggregated profitability dropped sharply to negative 6 percent before falling further to negative 24 percent in 2016, falling in all segments.

In 2017, the combined operating profit for the cluster was in the red, with an overall margin of -1 percent. The negative result was driven by bad performance by the equipment segment, which experienced a tough period from 2015 to 2017. In particular the challenges faced by Rolls-Royce Marine in this period explain this finding. Excluding Rolls-Royce Marine, the equipment manufacturers segment delivers a positive margin. In fact, the result for the whole cluster shifts from -1 percent to 2 percent when Rolls-Royce Marine is taken out.

Operating margin as a measure of profitability

Net operating margin is defined as operating profit as share of turnover. In other words, the net operating margin is equivalent to a company’s operating net income as a share of its operating gross income, where the term “operating” reflects that financial income items are excluded. The operating margin is perhaps the most commonly used measure of profitability in private companies. A weakness of the measure is that it concentrates on companies’ “turnover” rather than value added. For example, consolidation of companies in an industry will lead to fewer goods and services purchased, since some transactions will now be internal. The consolidation will result in an increased operating margin, even though there has not been any direct improvement in profitability. What is more, changes in input mix and the degree of outsourcing might have indirect effects on profitability.

2.6. The cluster is consolidating into larger and more competitive companies

The cluster is consolidating and growing within new ocean industries. Mergers and acquisitions have changed the ownership in the cluster and created larger units that are more competitive. This development is visible in most parts of the cluster. Below, we have gathered an overview illustrating the development.

Table 2-2: Overview of the important mergers, acquisitions and changes in ownership in the Blue Maritime cluster

Shipping:	Yards:	Equipment:
<p>The region is becoming less important after several mergers and acquisitions.</p>	<p>New owners and increased focus on controlling a larger value chain.</p>	<p>Companies are integrating horizontally and vertically.</p>
<ul style="list-style-type: none"> <li data-bbox="197 465 544 577">□ Farstad and Rem taken over by SolstadFarstad, which becomes the biggest offshore shipping company in Norway, with the headquarter in Karmøy. <li data-bbox="197 595 555 730">□ Havila is refinanced and purchases Volstad Maritime. Havila has secured a refinancing deal, which means that the Sævik family kept its control of Havila. In 2017, it purchased Volstad Maritime's fleet. <li data-bbox="197 748 560 931">□ Havila Kystruten takes up competition with national actors like Hurtigruten in the ferry market. Havila Kystruten is building up a large organization in the region (500-600 employees) and has been awarded 4 of 11 routes along the coast in 2021. 	<ul style="list-style-type: none"> <li data-bbox="592 472 951 752">□ Kleven yard is divided in two (Myklebust Verft and Kleven). Kleven is the largest of the two yards and will be controlled 100 % by Hurtigruten after a new financing plan was announced in 2018. The Kleven family and local investors will still have owner interest in Myklebust Yard. Myklebust currently has 120 permanent employees and two plug-in hybrid ferries under construction. <li data-bbox="592 786 951 999">□ Vard is now de-listed and 100 % owned by Fincantieri. Vard has bought several companies in recent years. One especially important acquisition was Storvik Aqua in 2016. Storvik Aqua is now integrated with Vard's operations and called Vard Aqua. It focuses on aquaculture equipment and services. <li data-bbox="592 1025 951 1373">□ Havyard has in recent years increasingly focused on equipment production and aquaculture. In 2012, it bought MMC (handling and cooling of seafood onboard fishing vessels) and in 2017 it merged Havyard MMC with a company with similar focus, First Process. The new company will be named MMC First Process and have more than 130 employees and a turnover above NOK 500 mill. In addition, it purchased NES (Norwegian Electrical Systems) in 2015 and gained full control of the company in 2018. 	<ul style="list-style-type: none"> <li data-bbox="984 472 1334 707">□ Kongsberg acquired Rolls-Royce Marine for NOK 5.3 bn in 2018. Kongsberg ownership should be seen as good news for Rolls-Royce Marine. Kongsberg is a long-term owner with a willingness to develop the company further and with a portfolio which is mostly complementary to Kongsberg's own products. <li data-bbox="984 775 1334 887">□ Brunvoll bought Scana Propulsion (including Scana Volda) in 2016 to consolidate its position as a leading actor in the market for propulsion and maneuvering systems. <li data-bbox="984 965 1343 1200">□ Optimar, Stette and Seaside merged in 2014/15 to become a more competitive actor in the fish handling market. Since then their combined turnover has more than doubled, with revenues of close to NOK 1 bn in 2017. In 2017, Optimar was sold to a German investment fund. This illustrates the future growth potential within this area.

Consolidation is a typical development in a downwards-turning business cycle. As a strategy to maintain growth in a market with low growth prospects, the companies have consolidated the market by purchasing other companies or merged into bigger units. For the consolidation in Møre, there appear to be many motives:

- **Take positions in growth markets:** some of the M&As are a clear strategic effort to secure positions in new growth markets.
- **Continued growth in stagnating markets:** As a strategy to maintain growth in a market with low growth prospects, the companies have consolidated the market by purchasing other companies or merged into bigger units.
- **Reduce risk and longer time horizons:** some of the companies have got stronger owners (local or international) with long time-horizons. This gives the management time to make good investments and strategic decisions about the future market.
- **Increased control over the value chain:** In some segments (particularly for the yards), the consolidation is a strategic decision to control a larger part of the value chain, to improve margins and profitability.

3. Competitive analysis

In this chapter, we benchmark the cluster’s performance to both national and international actors. The Blue Maritime Cluster was outperformed by the benchmark of Norwegian maritime companies in 2017. The value added continued to fall in the cluster but was stable in the benchmark. Moreover, the gap in productivity between the cluster and the benchmark increased to an all-time high. At a segment level, the shipping companies are struggling as the fleet is significantly smaller and has a higher share of laid-up vessels than both the national and global average. The large equipment manufacturers continued to struggle with low profitability. Services, on the other hand, represent the most stable and profitable segment in the cluster. Møre and Romsdal remains the most important area in Norway for shipbuilding activities. However, the yards have been through a tough year, with high debt, negative profitability and restructuring, which suggests that a crucial year is ahead.

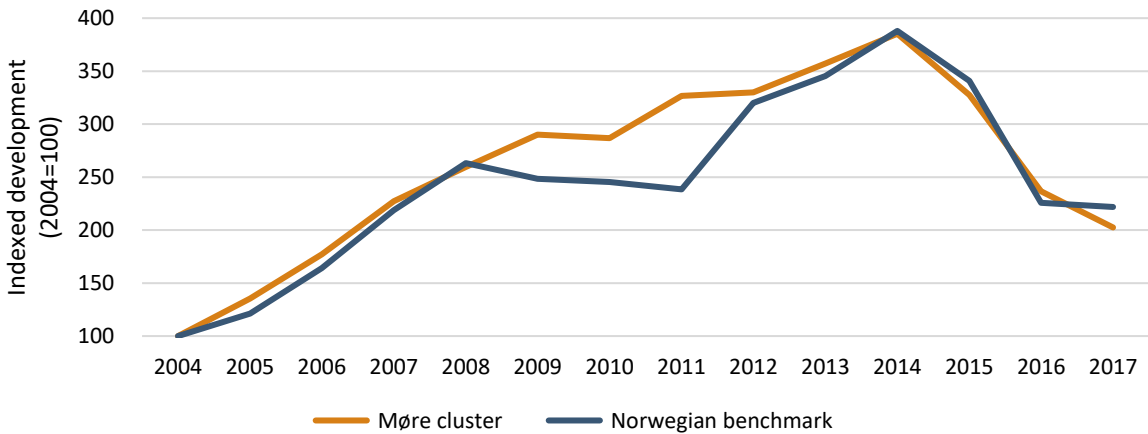
3.1. National benchmark analysis

It is difficult to draw conclusions on the relative performance of the cluster based solely on the financial analysis for the cluster companies. Therefore, it is interesting to compare the performance of the Møre cluster to a benchmark of Norwegian companies in the same market segment⁶. This will allow us to analyze whether the developments are explained by market conditions or by factors within the cluster.

3.1.1. The national benchmark outperformed Møre in 2017

In the figure below, we have compared the value added in the Møre cluster to the national benchmark. We can observe the high level of correlation between the two. This tells us that the development in Møre and in the benchmark is to a large degree driven by market characteristics. Therefore, it is most interesting to analyze where the two graphs diverge.

Figure 3-1: Indexed development of value added for the cluster and the Norwegian benchmark. Source: Menon (2018)



⁶ The benchmark consists of maritime companies with similar market focus and activity as the companies in the Møre cluster. The development in the benchmark is weighted so that the composition of different activities in the Norwegian benchmark is the same as in the Møre cluster.

Both the cluster in Møre and the benchmark of similar companies in Norway performed extremely well in the period from 2004-2008. Value added almost tripled in this period. In the following three years, however, the Møre cluster continued the same trajectory with an annual growth rate of 8 percent and outperformed the Norwegian benchmark. Since 2011, the Norwegian benchmark has caught up and has been growing at a similar pace⁷.

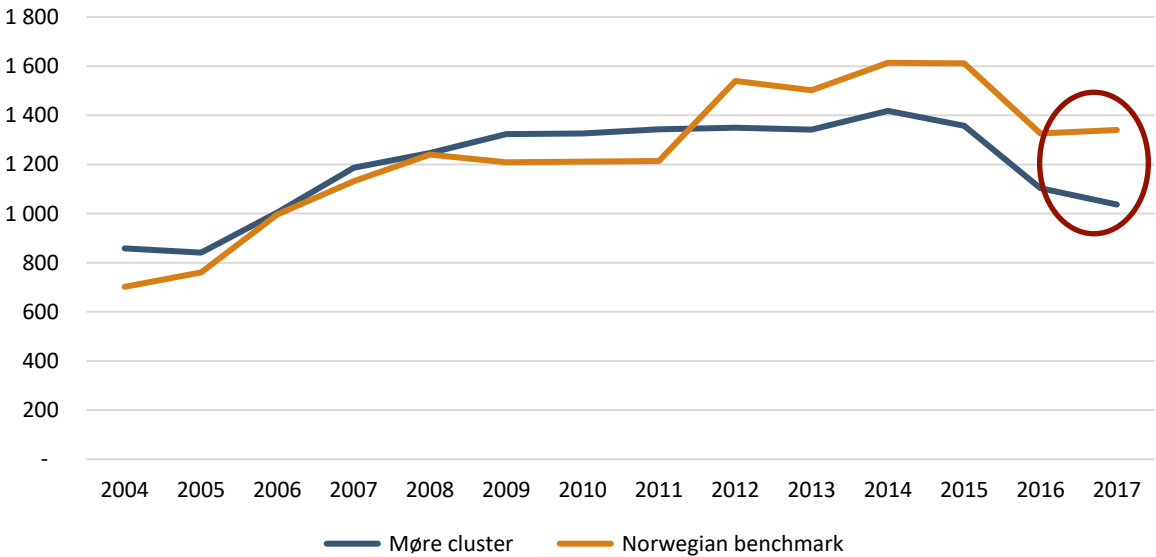
By 2014, the national benchmark had caught up with the Møre cluster. After 2014, both the Møre cluster and the national benchmark have faced tough market conditions, and the value added fell significantly in both groups. It is interesting to observe that they fell at a similar, significant pace in 2015 and 2016.

In 2017, however, the national benchmark outperformed the Møre cluster⁸. The value added in the benchmark stabilized, while it continued to fall in the cluster. This development is partly driven by the exit of Farstad and Rem, which contributed with a combined value added to the national benchmark of NOK 1.4 billion.

3.1.2. The Møre cluster has never been less competitive – the gap in productivity increases

Another way to benchmark the cluster’s performance is by productivity. Below, we find two graphs comparing value added per employee in the cluster against the Norwegian benchmark.

Figure 3-2: Development in productivity (value added per employee) between the cluster and the national benchmark. Weighted average based on the cluster’s share of employment in each segment. Source: Menon (2018)



⁷ The steep increase in the benchmark from 2011 to 2012 is explained by outstanding performance by the offshore shipping companies in the national benchmark, which represent an increasingly important share of the Møre cluster in these years. In particular, DOF Subsea increased its EBIT with more than NOK 1 billion from 2011 to 2012. In other segments, large companies like Technip and National Oilwell Varco also experienced high growth.

⁸ It is important to note that the value added per employee-measure is sensitive to changes in employees and capital from one year to the next. This could lead to a trend-shift larger than what is “real”. For instance, if a company hires employees to prepare for higher activity, this can show up in the form of lower productivity from one year to the next.

The graph illustrates the value added per employee in the two groups. It shows that value added per employee increased in Møre compared to the benchmark between 2008 and 2011. After 2012, the benchmark caught up and passed Møre. Again, this was driven in part by the introduction of productive offshore companies like DOF Subsea. Productivity in both groups fell between 2014 and 2016. Productivity in the cluster has not increased continuously since 2009 (except for 2014) and has fallen rapidly after 2014. In 2017, it is back at the 2006-level.

In 2017, the gap in productivity between the cluster and the benchmark increased as productivity in the benchmark group recovers in 2017⁹. The gap between the Møre cluster and the national benchmark has never been bigger, indicating that the Møre cluster’s competitiveness is declining.

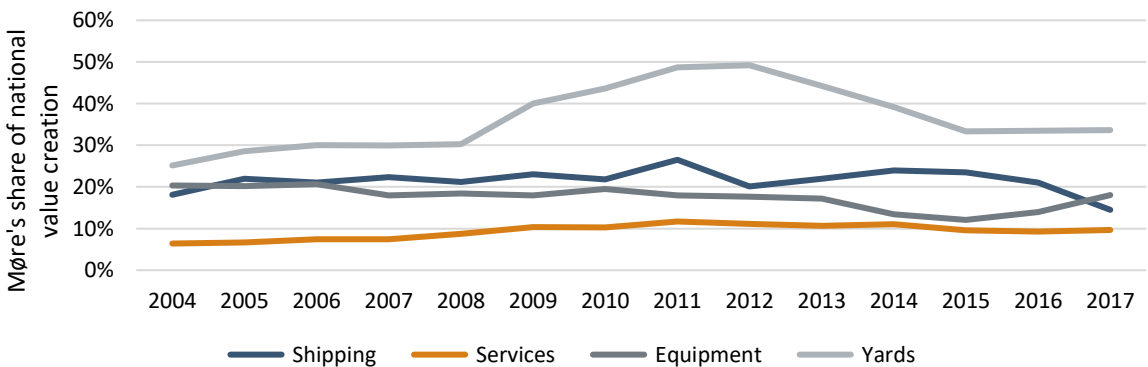
There are several potential explanations for this decline. The first is that the traditionally tightly integrated value chain, once the key feature of the Blue Maritime cluster, is becoming “looser” and the cluster linkages are weakened. As the shipping companies have not ordered ships for years, the yards needed to find new costumers and new relationships. More generally, customers and suppliers outside the region have become more important. These characteristics can affect productivity as they influence both products and services demanded, business models and relationships.

3.1.3. Equipment producers are capturing a larger share of the maritime industry as the national industry suffers

A more intuitive way of looking at the cluster’s development compared to the national industry is to examine the cluster’s share of national value creation. This can illustrate the cluster’s “market share” of the national market.

On an aggregate level, the cluster grew more than the national industry from 2004 until 2011. In this period, the cluster’s share of national value added increased from 10 to 16 percent. Since then, this share has been falling steadily, especially in the last three years. In 2017, 11 percent of the value added in the national industry was generated in the cluster.

Figure 3-3: Møre's share of the value creation in the maritime industry. Source: Menon (2018)¹⁰



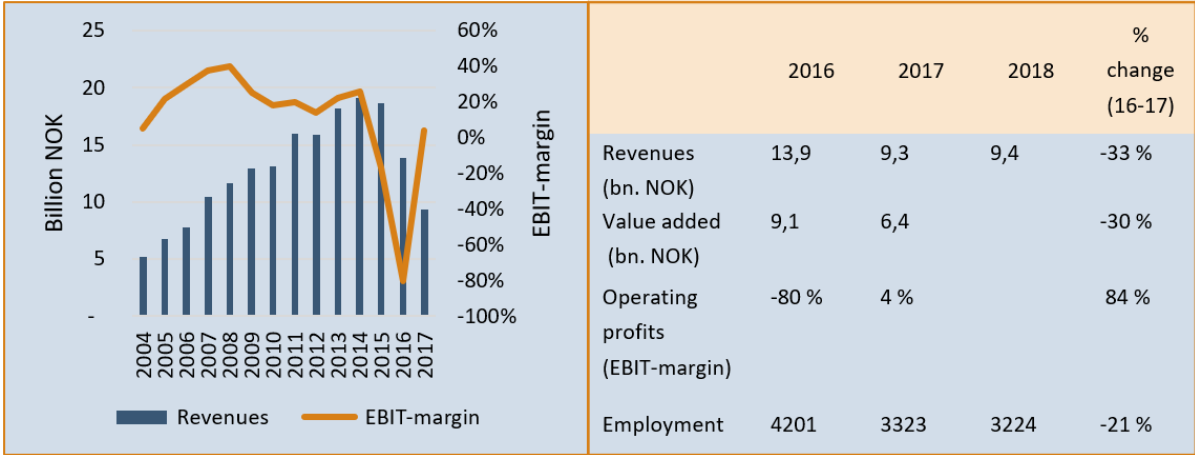
⁹ The development in the benchmark is driven by positive development by the offshore shipping segment. Companies like Polarcus, Farstad and the DOF and Technip subsidiary Techdof Brasil AS contribute to a positive development in the value added per employee in the benchmark.

There is great variation in the relative performance on segment level, as seen in the figure. The shipping segment has experienced a steep decline in market share, driven by the Farstad/Rem-exit, decreasing by 10 percentage points since 2014. On the other hand, the equipment manufacturers in Møre have performed relatively well, delivering 18 percent of the value added nationally. For the equipment manufacturers, it is also important to note that this increase is partly explained by the poor performance of some of the leading companies in the benchmark. For instance, companies like National Oilwell Varco have experienced a dramatic fall in activity and will therefore represent a significantly lower share of the value creation among the national benchmark of equipment manufacturers.

Yards is the segment where Møre continues to have the largest national share, which has stabilized at around one third of the total value added for yards.

3.2. Shipping companies are struggling to become profitable and are becoming less important for the cluster

Figure 3-4: Development within the shipping segment. Left: Turnover and EBIT-margin for the shipping companies. Right: KPI for the shipping segment. Source: Menon (2018)



Turnover and value added generated by these companies have stabilized after three years of sharp decline. Moreover, the shipping companies delivered positive operating margins after two consecutive years of negative results. Still, the profit level is low and not substantial enough to cover financial costs. Looking ahead, there is cautious optimism in the shipping segments, with expectations of increasing revenues in 2018 and 2019. However, there are large questions when it comes to the competitive situation of the shipping companies that remain in the cluster.

Møre is losing its position as the main center for offshore shipping in Norway

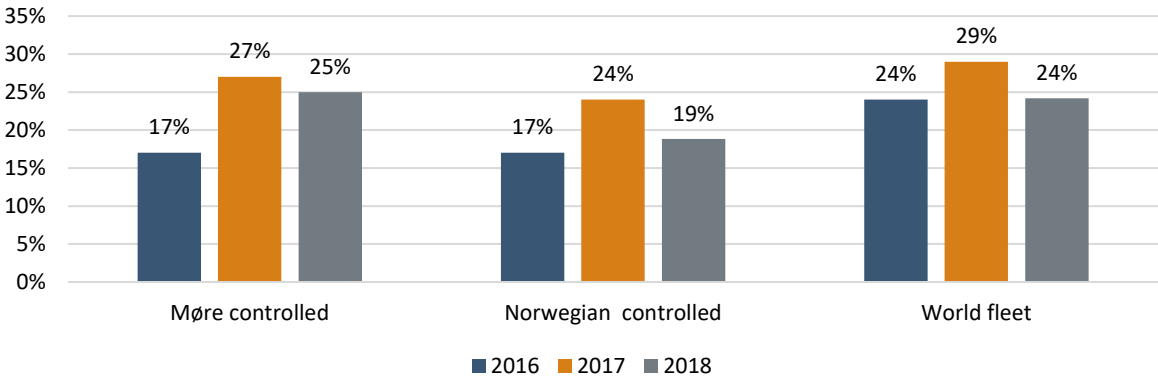
Møre has been and still is a central area for operations and ownership of offshore vessels, but it is no longer the national hub for offshore shipping. The consolidation of the offshore market has significantly weakened Møre’s position. With the Farstad and Rem merger with Solstad, Møre saw more than 70 vessels leaving the county.

The Norwegian-owned offshore fleet consisted of around 630 offshore vessels in 2018, and only 21 percent of these offshore vessels run their operations from Møre¹¹. While we do not have Møre’s share for previous years, we can safely assume that this share has fallen significantly. The company with the largest fleet, Island Offshore, controlled only 3 percent of the Norwegian-owned fleet.

From above-average to below-average – the offshore companies struggle with a high share of laid-up vessels

The offshore companies operate in a global market, and after the oil-price shock in 2014, the global offshore shipping industry was hit hard. A good indicator of this downturn in activity is to look at the fleet-share that is laid up, as shown in the figure below. The relative share of the fleet that is laid up is also a performance indicator: if vessels are taken out in service, the shipping company expects business.

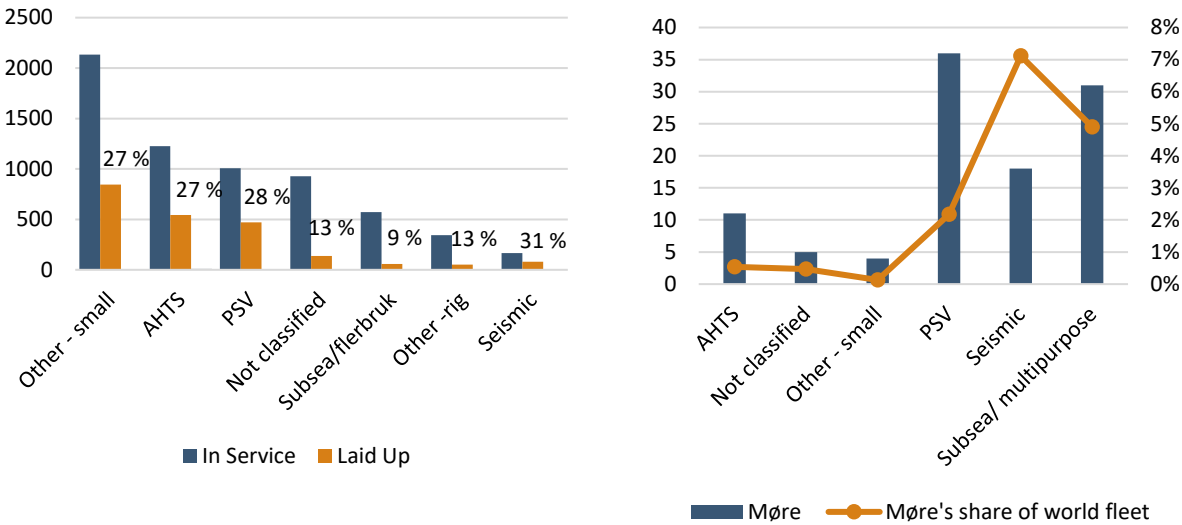
Figure 3-5: Share of the respective group’s offshore fleet that is laid up. Source: Clarkson/Menon (2018)



The figure shows that the offshore shipping industry in Møre is struggling. In 2016, the Møre and the remaining Norwegian-controlled fleet had a significantly lower-than-average share of the fleet laid up. Two years later, this situation has worsened: the share of vessels laid up has increased to a level that is higher than the world average. Meanwhile, the remaining Norwegian fleet still has a significantly lower-than-average share laid up.

¹¹ We are only counting vessels that are active, meaning either in service, idle or laid up. Vessels that are in orderbooks

Figure 3-6: Left: The world fleet broken down by the vessels' categories and according to their service status. Right: The offshore fleet operated from Møre and Møre's share of the world fleet. Source: Clarkson / Menon (2018).

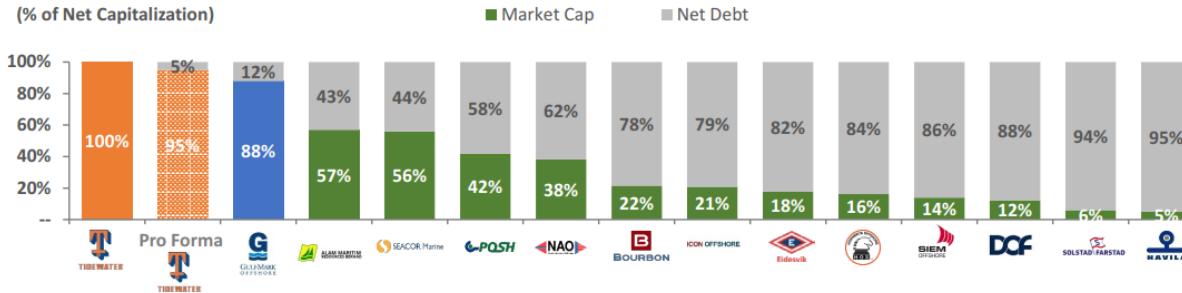


One factor that can explain this poor performance is the high share of PSV vessels in the Møre-fleet. 28 percent of the world PSV-fleet is laid up and Møre has a significant share. The shipping companies in Møre also have a high share of the world's seismic fleet, the vessel type with highest share laid-up. However, there are relatively few seismic vessels compared to PSV, AHTS or subsea vessels, so that this cannot explain the difference in laid-up share.

Norwegian owners are highly leveraged – which reduces their international competitiveness

The graph below illustrates one of the largest challenges for both Møre-based and Norwegian owners. The offshore shipping companies in Norway have high debt levels compared with their international competitors. Financial costs make up a large share of the revenue in the industry. Due to this, it will be difficult for Norwegian shipping companies to compete against the larger international players with a lower level of debt.

Figure 3-7: Market value as share of Net Capitalization. Source: Tidewater

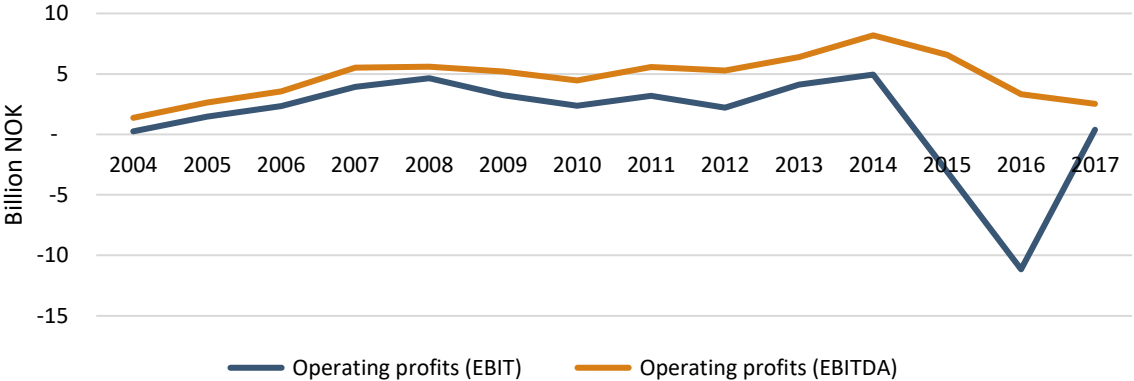


The losses are taken?

2016 was characterized by massive depreciation and write-down of values across all segments, but especially the shipping segment. The EBIT-margin analysis earlier in this report includes the value of depreciation and amortization, which is a vital part of the more capital-intensive segments in the cluster, like the shipping segment. It is therefore interesting to compare the EBIT-margin to the EBITDA-margin (excluding depreciation and amortization) for the shipping companies. In 2016, the value of the depreciation and amortization for the

shipping companies amounted to NOK 14.5 billion, a figure that was higher than the total revenues in the segment.

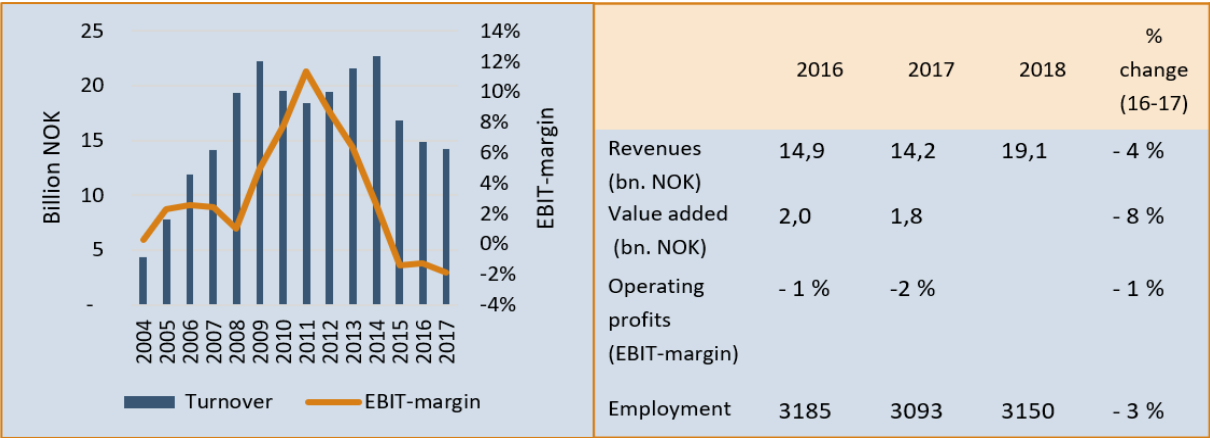
Figure 3-8: EBIT vs. EBITDA within the shipping segment. Source: Menon (2018)



The interesting point here is that the EBIT- and EBITDA-margin converged in 2017. The value of the depreciation and amortization in 2017 was NOK 2.1 billion, which is similar to the gap between the two metrics between 2008 and 2012. This suggests that the majority of the losses was taken in 2016. A more stable valuation of assets is crucial in order to reduce risk and bring down the financial costs.

3.3. Crucial year ahead for the yards – can they be profitable?

Figure 3-9: Development within the yards segment. Left: Turnover and EBIT-margin for the yards. Right: KPI for the yards segment. Source: Menon (2018)



Møre and Romsdal is still the most important area in Norway for shipbuilding activities, even though the last years have been tough for the yards. Since 2014, revenues have fallen by almost 40 percent and 1 000 employees have lost their jobs as the demand for offshore vessels fell dramatically.

In 2017, the downward-pointing development slowed down, but 2017 was still a tough year for the yards. Revenues continued to fall, down 4 percent from 2016. Value added fell by 8 percent, and the operating margin was negative for the third consecutive year. Thus, looking solely at the accounts, the situation is precarious. However, already in 2018 revenues are expected to grow by approximately 22 percent, resulting in a total revenue of NOK 19.1 billion.

As the new-building activity fell, the yards engaged in fierce international competition to secure contracts. They took great risks on deals with low margins. Subsequently, all four of the main yards in the cluster, Vard, Kleven, Ulstein and Havyard, have experienced losses. As we saw, the financial situation is now distressed, with high debt and financial costs.

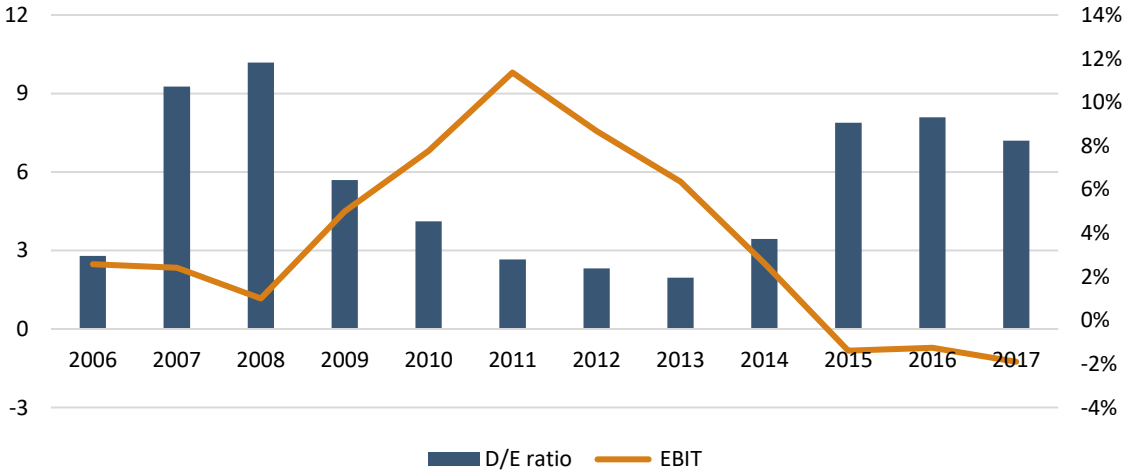
The Møre-region is also home to smaller yards focusing on building smaller specialized vessels and repairs. These smaller yards have mainly focused on repairs and other segments than offshore oil and gas. Companies like Fiskerstrand, Larsnes and Aas yards all delivered positive operating profits in 2017.

The yards are highly leveraged and will need to deliver profits soon

After 2014, the companies within the cluster have been in a difficult financial situation. As we have seen, there are substantially lower revenues and negative operating profits. This has had a strong impact on the balance sheets also. The financial structure of the companies has changed fundamentally over the period. This is especially important for the most capital-intensive parts of the cluster: yards and shipping companies.

Since 2014, both the yards and shipping companies have seen their debt-to-equity ratio increase significantly. The debt-to-equity ratio indicates how much debt is used to finance a company’s assets relative to the value of its equity.

Figure 3-10: Debt-to-equity ratio for the four biggest yards (left axis) and operating profits for the yards segment (right axis). Source: Menon (2018)



For the yards, the equity ratio tells an illustrative story of the development in the market for the last ten years. Before the financial crisis, the yards invested heavily to deliver highly specialized vessels in a growing offshore-related market. From 2009, the investments started paying off, hitting record high EBIT-margins. Despite considerable debts, the debt-to-equity ratio continued to fall as the operating profit kept improving the balance sheets of the yards.

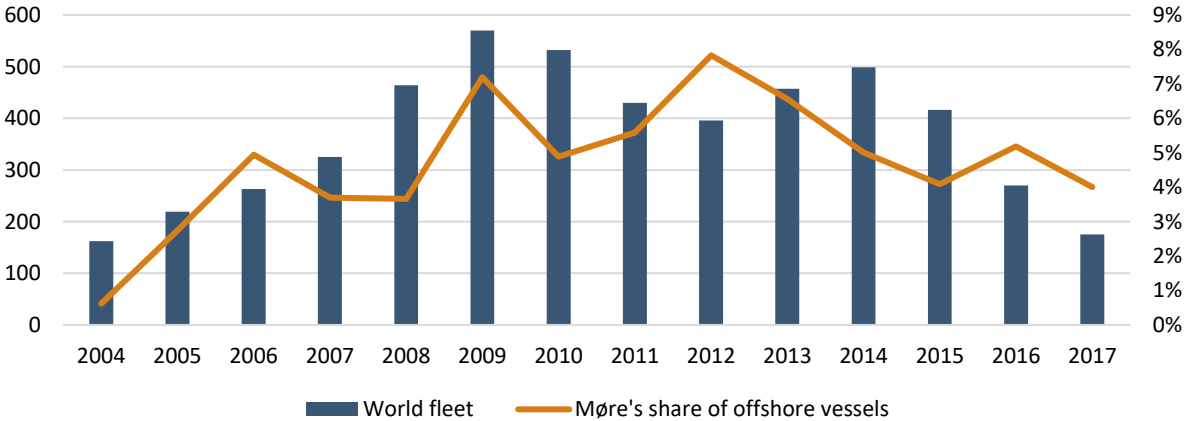
Then came 2014. The yards, with Kleven and Vard in particular, had to take up new loans at the same time as they started seeing negative EBIT-margins and the value of their assets shrunk. Due to the low activity level, as we have seen, the yards have been struggling to finance this high debt level, and the EBIT-margin continued to show red figures. The situation for the yards was still critical in 2017. Moreover, the results for 2018 are below expectations for the publicly listed yards, Havyard and Vard. Havyard presented a loss (before tax) of NOK

27 million, or -2,6 percent, in the first half of 2018¹². Similarly, VARD also delivered a combined operating loss for 2018¹³. High levels of debt and negative operating margins mean high levels of risk, and the yards need to deliver positive margins going forward.

Demand for offshore vessels have fallen dramatically – the Møre yards have lost market shares

Delivering highly specialized and offshore vessels has been the driving force of the performance of the yards (and the whole maritime cluster) in Møre. However, as the offshore market has experienced significantly lower activity levels and massive oversupply of vessels, the market conditions for offshore-dependent yards have been tough.

Figure 3-11: Annual deliveries of offshore vessels world-wide and Møre’s share of these deliveries. Source: Clarkson/Menon (2018)



In the figure above, we observe the development of offshore vessels delivered annually from 2004 to 2017. Between 2009 and 2014, the number of annual deliveries was between 400 and 550. At the same time, Møre’s share of these deliveries increased, from 4 percent in 2008 to the peak of 8 percent in 2012. That year, 31 of the total 396 vessels were made by Møre-owned yards. In 2011 and 2012, the operating profit also peaked with EBIT-margins of 11 percent. The yards were highly competitive.

After 2014, however, the delivery rates have fallen with more than 70 percent, from 500 to 150 vessels in 2017. In this period, Møre’s share of these deliveries also fell. This indicates that in the period after 2014, the Møre yards have struggled to compete internationally in a tougher market.

¹² http://www.vard.com/SiteCollectionDocuments/Investor%20Centre/20180727_Financial%20statements.pdf
¹³ http://issuu.com/cannas/docs/hgr_2018_q2_1_?e=2274360/64138554

Figure 3-12: Number of new global contracts for PSV, Measured in value of the world orderbook, the pattern AHTS and Others. Source: Clarkson/Menon (2018)

	Number of vessels		
	2016	2017	aug.18
AHTS	4	0	0
PSV	4	4	0
Other	49	24	14
Total	57	28	14

represent a majority) had a market share of almost 5 percent of the global orderbook for offshore vessels. This share has declined continuously through 2017, falling to under 2 percent.

Recent development, however, shows signs of improvement in activity in the market for newbuild cable layers and subsea vessels. Møre yards have recently won important contracts in this market. From January to September this year, the market share of the global orderbook has improved by one percentage point, hitting 3 percent¹⁴.

It will take time to readjust the overcapacity in the OSV market. We have seen a sharp decline in the number of offshore vessels in the global orderbook. This is seen most notably for the PSV’s and AHTS vessels, traditionally an important segment for the Møre yards. From 2016 to 2018, only 12 AHTS & PSVs have been contracted. In fact, by August 2018, there are no AHTSes or PSVs in the global orderbook at all.

Moreover, few OSV vessels are scrapped despite oversupply in the sector. Around 50 AHTSes have been scrapped annually in 2016-2018, while the number for PSV/supply units has been less than 30. Only between 1.1 and 1.9 percent of the fleet is being scrapped annually. Low scrapping value compared to other types of ships and high rebuilding costs to reuse the OSVs in other segments mean that the opportunity cost of being laid up is smaller. This explains why these ships are laid up for longer periods.

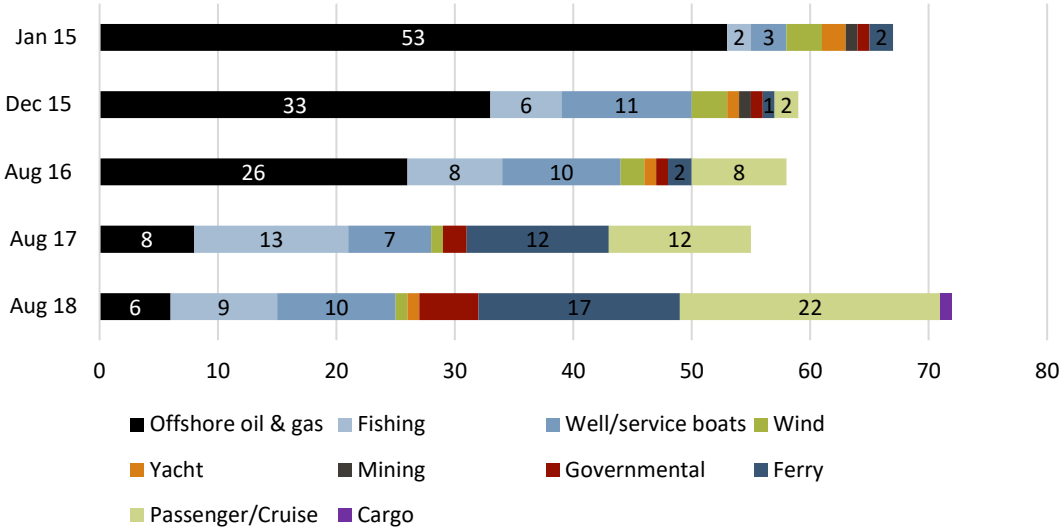
A story of restructuring capability– offshore’s share of the yard’s orderbook reduced from 80 to 8 percent in three years

The cluster was heavily dependent on the demand for the offshore supply segment before 2015. In January 2015, almost 80 percent of the vessels in the yards’ orderbooks were going to the offshore (oil and gas) segment. A combination of significantly lower demand for new offshore vessels, together with cancellations of existing contracts, has reduced the number of offshore vessels in the orderbooks dramatically. As shown in the figure below, the number has fallen from 53 vessels in January 2015 to only 6 vessels in August 2018.¹⁵

¹⁴ Clarkson and Menon (2018)

¹⁵ This is the national orderbook for Norwegian yards. However, the four biggest yards in Norway are located in Møre, and thus represent the majority of the national orderbook.

Figure 3-13: Number of vessels in the Norwegian orderbook in August 2018 split by type of vessel. Source: Norsk Industri (2018)

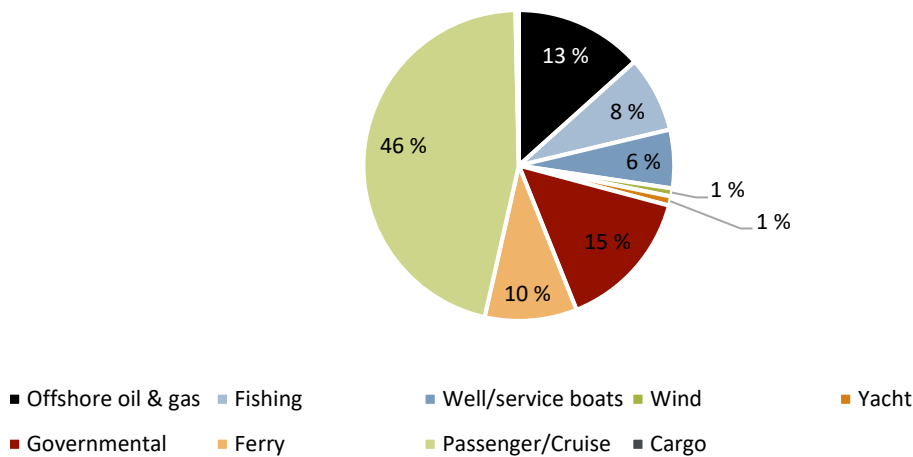


The offshore market went from representing almost 80 percent of the vessels in the orderbook to under 8 percent in 3.5 years.

At the same time, the yards have repositioned themselves to compete for contracts in other segments. The figure above shows how the Møre yards have succeeded in diversifying their portfolio of vessel contracts. Three markets in particular have become more important: the cruise/passenger market, the ferry market and the market for fishery (including well boats). These three segments now represent more than 80 percent of the orderbook, an impressive increase from only 10 percent in August 2015.

Yards orderbook hits record-high value – more diversified than ever

The orderbook at Norwegian yards is now record high at NOK 42 billion. The orderbook is almost doubled since the beginning of 2017. We have to go back to 2008 to find an orderbook that is larger than what we see today.



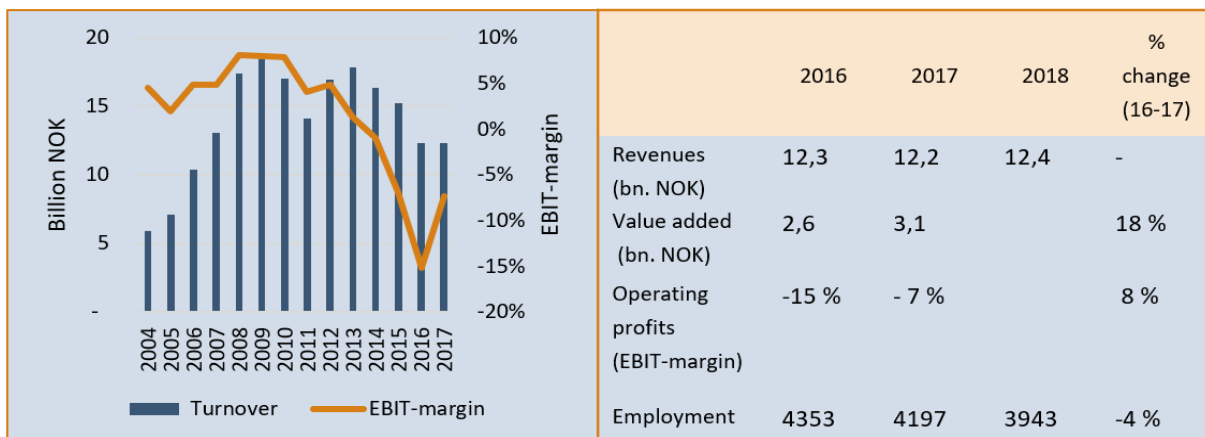
Cruise vessels are now taking up close to 50 percent of the orderbook at Norwegian yards (measured in value). They are now the most important segment for Norwegian yards. Fisheries and aquaculture combined are now slightly more important than offshore oil and gas. Moreover, Havyard is becoming an important player in the ferry market, with more than 10 ferries in its orderbook.

Hence, the orderbook is much more diversified today than earlier, which makes the cluster more robust against large changes in demand from single markets.

The world's first fully electric and autonomous container ship will be built in Norway after Yara signed the contract for Yara Birkeland in 2018, which is another market the Møre yards can become a dominant player in.

3.4. The large equipment manufacturers struggling while the SMEs remain profitable

Figure 3-15: Development within the equipment manufacturers segment. Left: Turnover and EBIT-margin. Right: KPI for the equipment manufacturers segment. Source: Menon (2018)



The equipment producers have seen the activity stabilizing after three years with significantly lower activity from 2013 to 2016. Since the peak in 2013, the equipment manufacturers have seen more than a third of their turnover

disappear. The lower market activity is seen through increasing pricing pressure with competitors competing for fewer orders in a challenging market.

The equipment manufacturers saw negative operating profits in 2017 also, with an operating profit margin (EBIT) of -7 percent. This is a significant improvement from last few years, but it is a clear indication that the segment is operating in tough market conditions.

On the other hand, with the poor performance in the shipping segment, the equipment manufacturers contribute with an increasing share of the value added in the cluster. In 2017, they contribute with 23 percent, the highest share for the equipment manufacturers since 2010.

The Møre cluster is home to some of the world's leading equipment manufacturers with Rolls-Royce Marine in the forefront. Through several acquisitions, Rolls-Royce Marine grew into the largest equipment manufacturer in the cluster, accounting for more than half of the revenue within the segment. In recent years, it has been no secret that Rolls-Royce has struggled. Since the peak in 2010, Rolls-Royce's revenues have fallen with almost 60 percent, and since 2014, it has an accumulated operating loss amounting to more than NOK 4 billion. Developments within the segment will consequently be dominated by this one player.

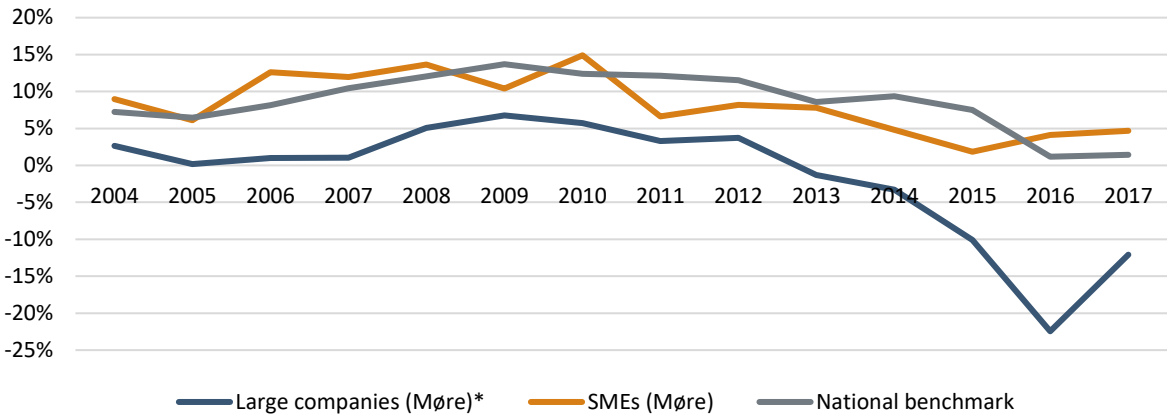
In the summer of 2018, Kongsberg Maritime announced the GBP 500-million-pound deal to take over Rolls-Royce Marine. Kongsberg Maritime is already a world-leading actor within ship automation, navigation and steering-systems, and with this deal it takes a lead position in the work on digitalization and autonomous ships. This deal secures jobs and activity in Møre and is likely to be an important boost for the equipment manufacturers in the region.

The weak aggregate results on a segment level hide the fact that beside the largest companies in this segment, the remaining companies are still profitable. Profitability for the small and medium-sized companies in the equipment segment has also fallen in the last years. Still, they delivered a positive net operating profit in 2016 and 2017, illustrating that many of these companies have been able to stay profitable.

The equipment manufacturers in Møre are less profitable than the national benchmark

Like the service segment, the equipment manufacturers segment is hard to benchmark. This is due to two different reasons. First, these companies serve widely differing markets, from fish handling gear to oil intervention equipment and vessels interior. Second, many of the largest companies internationally are conglomerates, making it difficult to extract information for maritime activities alone.

Figure 3-16: Development in profitability between the large companies and the SMEs, and the national benchmark. Source: Menon (2018)



* Includes Rolls-Royce (Bergen Engines), Inmarsat, Optimar and Brunvoll, the equipment manufacturers with a turnover exceeding NOK 500 million in Møre in 2017.

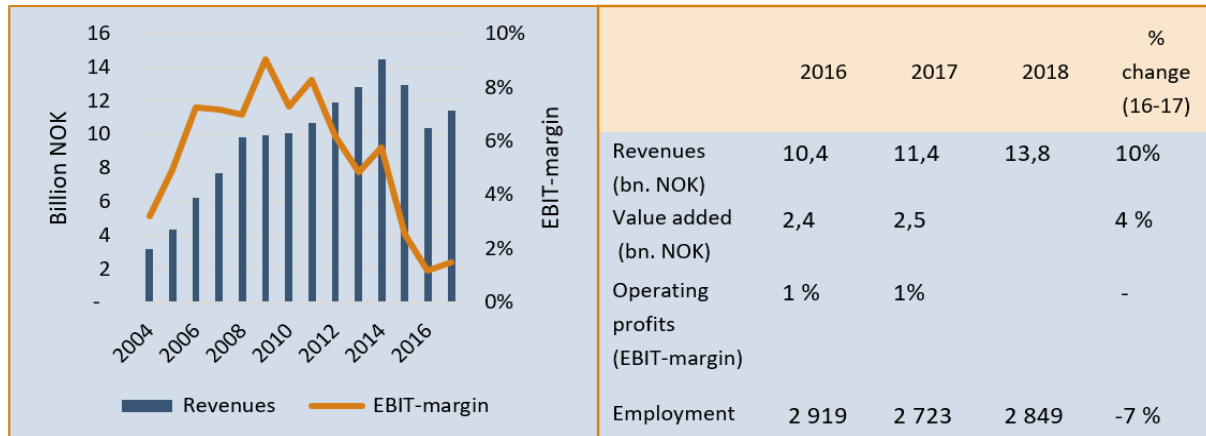
Profitability is an interesting benchmark since it captures the effect of the strategic choices in market positions. The graph above shows how the small and medium-sized equipment manufacturers in Møre have experienced a similar development as the national benchmark in this period. In fact, in both 2016 and 2017, they outperformed the benchmark, delivering EBIT-margins of 4 and 5 percent.

The graph also illustrates the difference between the large companies and the SMEs in profitability, and that the large companies have performed poorly compared to both the national benchmark and the SMEs in Møre. All these large companies have struggled with negative profitability. This is partly due to lack of demand from traditional customers, like the yards, but also large investments in R&D.

Going forward, we would expect consolidation also in this part of the cluster. Companies like Brunvoll have started this process already, by acquiring companies that allow them to utilize economies of scale. In general, the focus must be on both developing new products within the emerging sectors like fishery and cruise, at the same time as cutting costs through more efficient production processes. With the position of the segment today, this represents a major challenge: the need to invest in product and process innovation in a market with low profitability.

3.4.1. Services is the most stable segment of the cluster

Figure 3-17: Development within the service segment. Left: Turnover and EBIT-margin. Right: KPI for the service segment. Source: Menon (2018)



The service segment consists of companies that provide services to other companies in the cluster or directly to foreign companies. Activities include trade, installation and service of ship equipment, and other specialized maritime services like ship design.

During the downturn after 2014, both revenues and value added fell significantly for the service segment. However, the activity in the service segment is far less volatile than in any other segment of the cluster. Moreover, with the continued downturn in shipping, the service segment contributed with its highest share of value added ever in 2017. The service segment is becoming more important for the cluster.

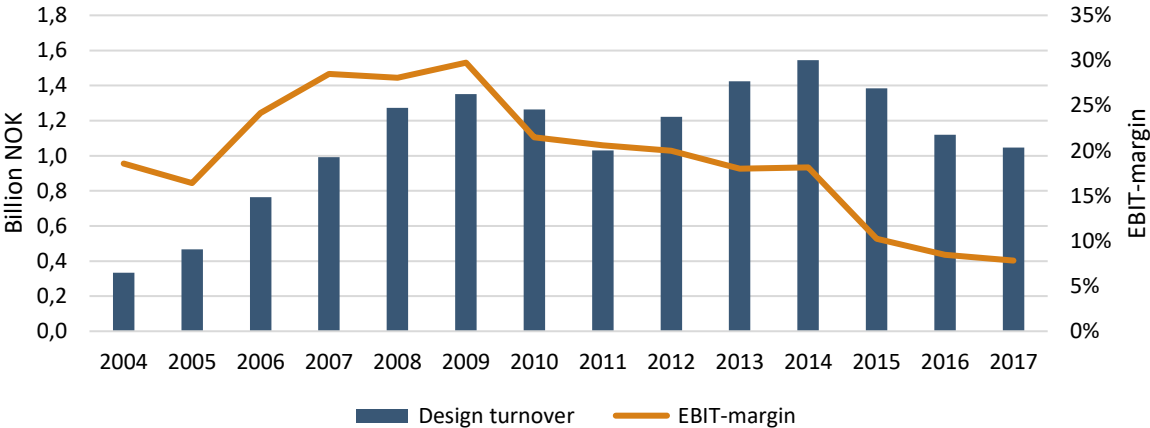
The single most important segment within services is technological services, like ship design or technologically demanding engineering services. It contributes with almost 50 percent of the revenues and 65 percent of the employment within services. Retail/trade also represents a significant share of this segment, especially for the revenues. This is driven almost entirely by the petroleum retailer Bunker Oil, however, with significantly higher-than-average purchasing share, with input costs equal to 84 percent of its revenues.

The service segment includes a diverse group of companies, delivering services to a broad set of clients. This makes it harder to benchmark the relative performance of the Møre companies on a segment level. Even within the individual segments, the companies target clients from different parts of the maritime industry, which makes the groups incommensurable.

The design companies have experienced tough market conditions – will they be able to adapt to new markets?

The most important feature in the Møre service segment is the design and engineering companies. They are a major driver for innovation and product development in the cluster and a key component of the valuation of ship concepts to the yard's customers. They play a significant role in proposing design solutions to ship owners based on what the Møre yards and equipment producers can deliver. Three of the four big yards have an in-house design department.

Figure 3-18: Turnover and EBIT-margin for the design companies. Source: Menon (2018)



Design normally delivers a solid operating profit margin. The margins followed the increasing revenues until 2010. After that, the margins have fallen continuously, even if the revenues continued to increase until 2014. After 2014, the design companies have followed the same trajectory as the rest of the cluster, but still performing considerably better. In 2017, the decline in revenues and EBIT-margin slows down.

With the passenger market on the rise, along with increased activities in a profitable aquaculture market, it will be interesting to follow how the design companies can adapt and be able to continue as an innovative sales engine for the whole cluster.

4. Market prospects

4.1. The tide in Møre is turning

For three consecutive years, the market conditions faced by the cluster companies have been tough. The strong dependency on the oil and gas industry offshore which for long periods of time has been one of the main characteristics of the cluster became its greatest weakness. All segments have been severely hit. 5 300 people have lost their jobs and the cluster creates the same amount of value as twelve years ago. However, 2018 should bring optimism and expectations of rising revenues for the cluster again.

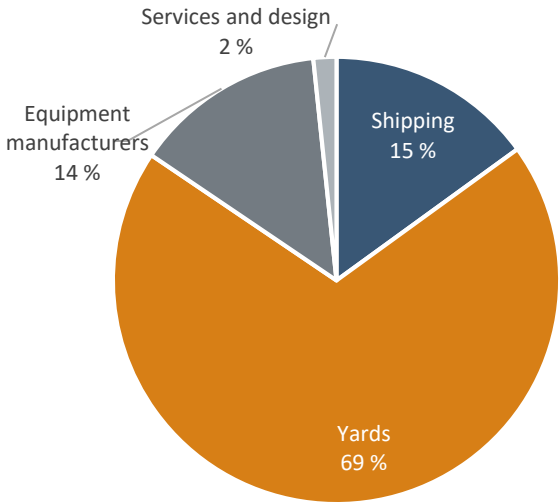
In our survey, respondents in all market segments expect their revenues to increase. By the end of 2019, we expect that the revenues of the cluster will again surpass NOK 60 billion. 700 jobs will be created in the same period.

Significant growth in orderbooks – the combined order reserve per August 2018 secures 14 months of operations

Based on the results from the survey, the order reserves are increasing significantly. Menon estimates that the combined order reserve as a percentage of the combined turnover has increased from 70 percent in August 2017 to 120 percent August this year. In other words, the order reserve has increased by from 8 to 14 months of operation in a year.

The yards are the segment that stands out with a particularly large order reserve. As shown in the figure below, the value of the yards’ orderbook represents more than two thirds of the combined orderbook value in the cluster. The value of the order reserve amounts to 173 percent of their annual turnover, or approximately 21 months of operation. Moreover, the order reserve in shipping also increases significantly. The shipping companies report that the value of their order reserves is now more than 14 months of operation.

Figure 4-1: Order reserves in the Blue Maritime cluster in August 2018. Source: Menon



An interesting observation is that there is a clear correlation between orderbooks and company size. While companies with less than NOK 50 million in turnover only have order reserves for 3 months ahead, companies

that have NOK 50-200 million in sales have order reserves for 13 months. Part of this may be explained by the fact that smaller yards are more oriented towards service of vessels.

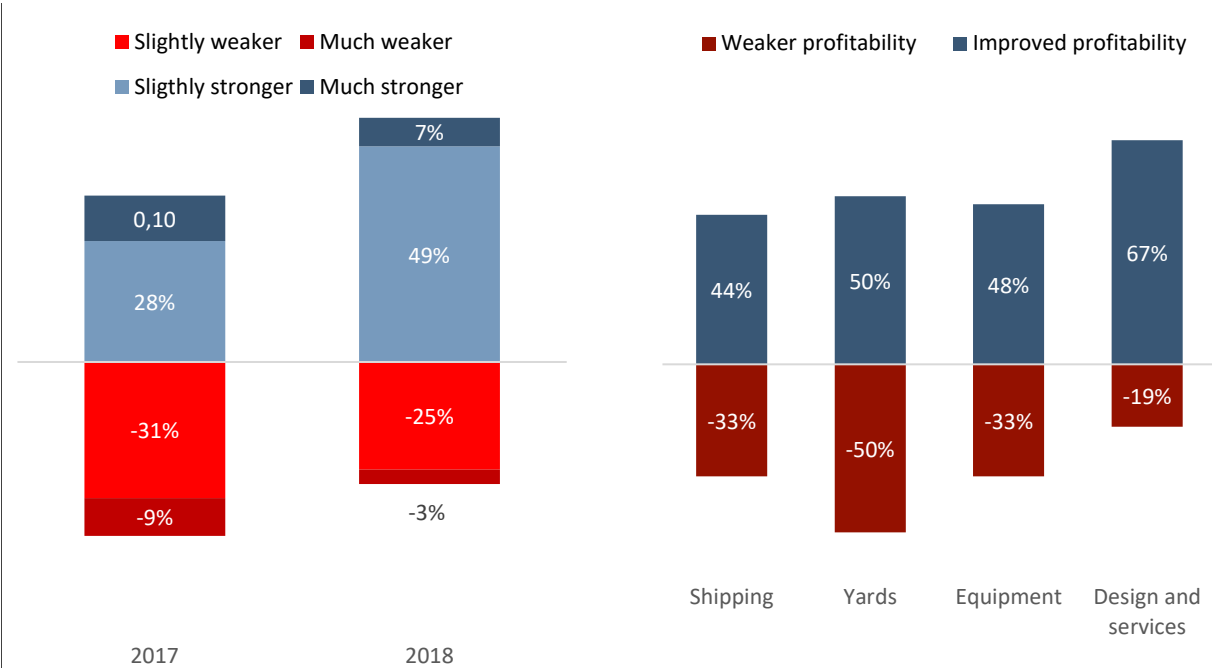
Increased activity for the yards and shipping companies is good news for the maritime industry. Due to the tightly integrated value chain in Møre, we expect to see ripple effects on the orderbooks from both equipment manufacturers and services in the coming years.

Companies’ expectations of profitability have been significantly strengthened since last year

For three consecutive years, the operating profitability in the Blue Maritime cluster has been in the red. Since 2014, the cluster combined has lost more than NOK 17.5 billion.¹⁶ A difficult financial situation puts pressure on the balance sheets of the companies and limits the flexibility necessary to restructure and exploit new market opportunities. It is therefore vital for the cluster companies to achieve positive margins.

According to our survey, there are positive signs. 55 percent of the companies expect operating revenues to be higher in 2018 than in 2017. On the other hand, 28 percent of the companies expect them to be weaker than last year’s. In last year’s survey, only 38 percent expected that 2017 would be better than 2016. 40 percent expected, at the time, the results to decline in 2017.

Figure 4-2: Left: The cluster companies’ expectation for next year’s operating profits: How do you expect that the operating profits will develop from last year’s results? Right: The cluster companies’ profitability expectations broken down to segments: How do you expect operating profits to develop this year compared to last year? Source: Menon (2018)



Service providers – including design companies – are the most positive. Two out of three expect the operating results to be better this year compared to last year.

¹⁶Combined and accumulated EBIT for the cluster in 2015, 2016 and 2017

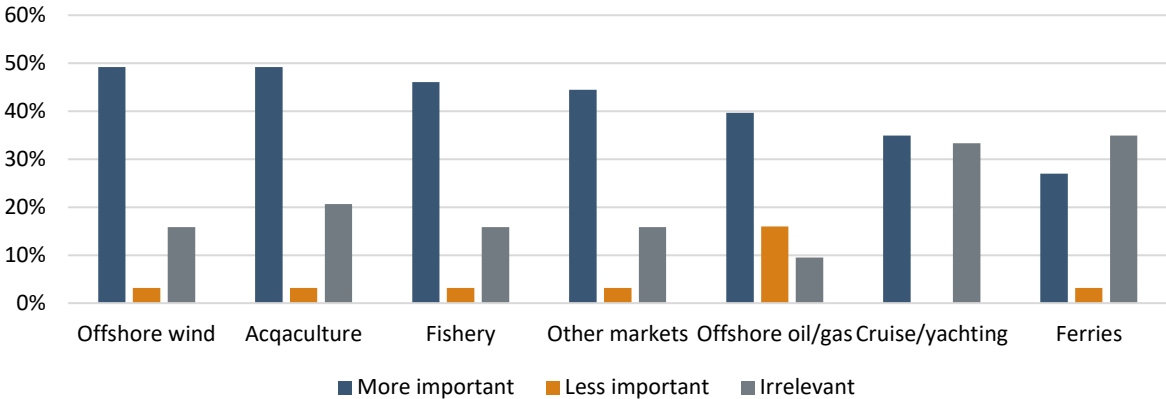
Among the shipping companies, there are some who expect operating revenues for this year to be better compared to last year. Among the yards, the percentage distribution is equal: as many expect stronger as weaker profitability. Equipment manufacturers are somewhat more positive than shipping companies and yards.

4.2. Offshore wind, fishery and aquaculture are growing in importance

After almost a decade with strong dependency on offshore oil and gas related activity, the Blue Maritime cluster is now in the midst of a fundamental restructuring to exploit opportunities in new markets, value chains and costumers. Three markets are looking particularly interesting for the cluster: offshore wind, fisheries and aquaculture, and cruise and exploration ships.

In our survey, nearly half of the companies in the cluster (including those who say that the market is not relevant for them) believes that offshore wind, fisheries and aquaculture will become more important for their business in the next 3-5 years.

Figure 4-3: Share of respondents in the cluster indicating that the different market segments will be more or less important in the coming years. Source: Menon.

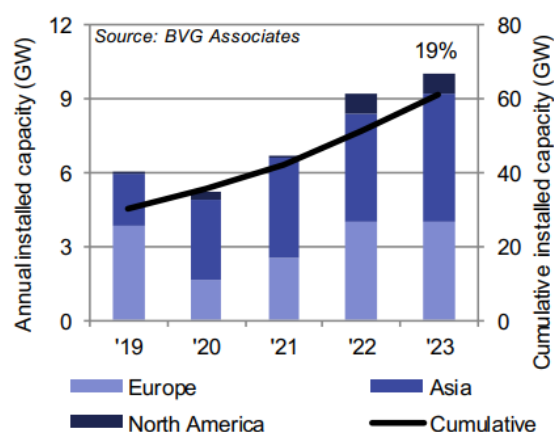


Strong growth potential in offshore wind

Deliveries to the offshore wind market made up 9 percent of revenue for the cluster in 2018. This is substantial and a sharp increase in only a few years’ time. Both the companies in the cluster and investment trends suggest that the importance of offshore wind will increase.

Investments in the offshore wind market are expected to grow further in the coming five years. As shown in the figure below, the cumulative installed capacity is expected to grow by almost 19 percent (CAGR) between 2019-2023.

Figure 4-4: Forecast for the global installed capacity in offshore wind 2019-2023. Source: BVG Associates



The industry is developing quickly. In 2002 the first utility-scale offshore wind farm with a capacity of 160 MW was connected to the grid in Denmark. Since then the average project has moved to sites further from shore, in deeper waters and with higher wind speeds. The capacities of projects also grew, and deployment was enabled at a greater range of sites accessing better wind resource. The cost of offshore wind is falling and in 2017 the first contract without any subsidies were awarded in Germany. If costs keep falling, the offshore wind market could grow substantially in the coming years.

These developments fit well with Møre’s capabilities of delivering specialized, advanced technology for challenging environments. The Møre yards have been able to leverage these capabilities to the operations and maintenance segment, as well as in the cable vessel segment¹⁷. Havyard recently secured a contract to build two offshore wind ships, which underpins that the Møre yards have the capabilities to compete within this segment¹⁸.

More than 90 percent of the Norwegian vessels utilized for offshore wind are multi-purpose vessels, meaning vessels that can perform operations within offshore wind in addition to other activities in the ocean space. There is now a clear trend for contractors to prefer purpose-build vessels. The Møre yards should therefore consider carefully whether they should specialize in this niche-market by delivering vessels targeted specifically at the offshore wind segment.

Will fishery and aquaculture remain profitable?

Fishing has been an important activity in the region ever since people settled in Møre. In recent years, the market for fishery and aquaculture has experienced an exponential growth in revenues and profitability. This has been driven by low bunker prices, high commodity prices and a healthy and favorable quota-situation. The most profitable segment in fishery has been cod, with the fleet increasing the operating margins from 12 to 26 percent in 2017.¹⁹ The big question now is where this segment is heading. Many factors will determine its destiny:

¹⁷ Eksportkreditt Norge (2017). Norwegian opportunities in offshore wind. From URL: [\[https://www.eksportkreditt.no/wp-content/uploads/2017/02/Norwegian-Opportunities-in-Offshore-Wind_ny-versjon.pdf\]](https://www.eksportkreditt.no/wp-content/uploads/2017/02/Norwegian-Opportunities-in-Offshore-Wind_ny-versjon.pdf)

¹⁸ <https://sysla.no/maritim/havyard-skal-bygge-nye-vindmolleskip/>

¹⁹ <https://sysla.no/maritim/ei-eventyrleg-utvikling-innan-fiskeri/>



Future quota-situation: There is an ongoing discussion on the size of the quotas for many types of fish, most notably for cod (International Council for the Exploration of the Sea)



Increasing interest rates: Many of the fishery shipping companies have invested heavily in new vessels and are therefore in large debt. With increasing interest rates, some companies could find themselves in a difficult situation.

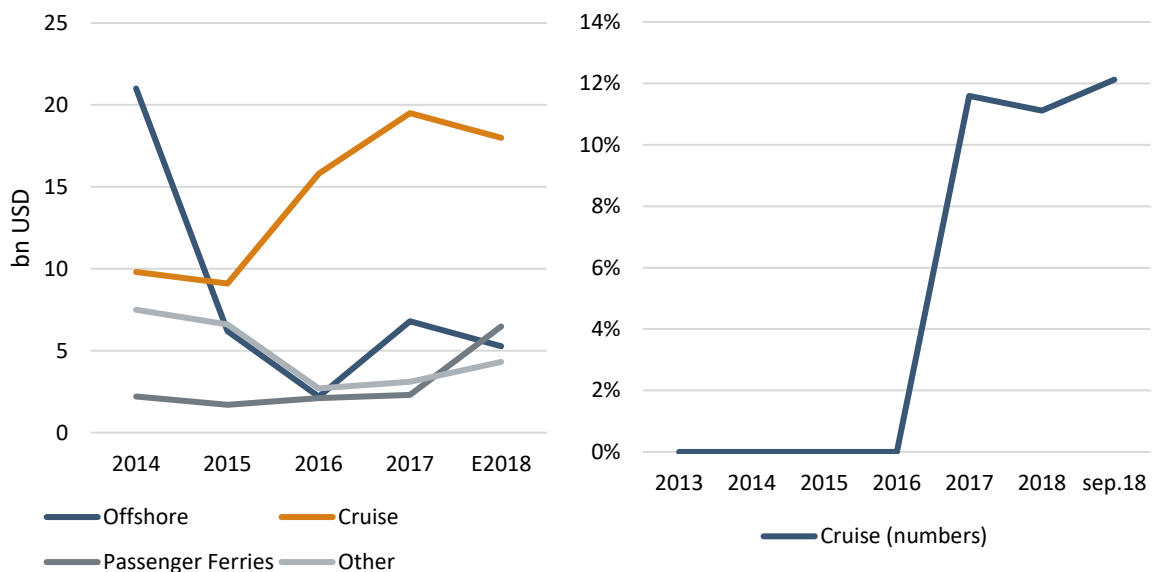


Exchange rates²⁰: For fishery and aquaculture, the exchange rates are particularly important as they receive most of their income in foreign exchange. A weak NOK has been favorable for this segment, but with increasing interest rates, we should expect a strengthening of the NOK.

The Møre yards are well positioned in a growing cruise market

One of the most promising markets is the cruise and exploration market for passengers. According to the Clarkson Shipyard Monitor, the annual investment in cruise vessels has more than doubled since 2015. In the figure below, we can observe that cruise is the segment with the by far highest growth in investments, followed by passenger ferries. It is estimated that the overall investment in cruise vessels will exceed the combined investments in offshore, passenger ferries and other in 2018.

Figure 4-5: Left: Investments in specialized vessels 2014-E2018. Right: Møre yards' share of the global orderbook for cruise ships. Source: Clarkson (Shipyard monitor)/Menon (2018)



This is great news for the cluster. The Møre yards, with Kleven, Ulstein and Vard in front, are strategically reorienting themselves towards the cruise segment. The three yards have already secured contracts for building cruise vessels towards 2021. The Møre companies have taken a strong position, with 35 percent of the cruise vessels registered in Cruise Industry News' orderbook for 2019 being delivered by the Møre yards.

²⁰ See chapter 4.5 for more on the exchange rates

The combination of size and complexity of the building process limits the number of companies that can deliver ships. Vard is in a particularly good position, with its owner, Fincantieri, being a dominant cruise-builder worldwide already.

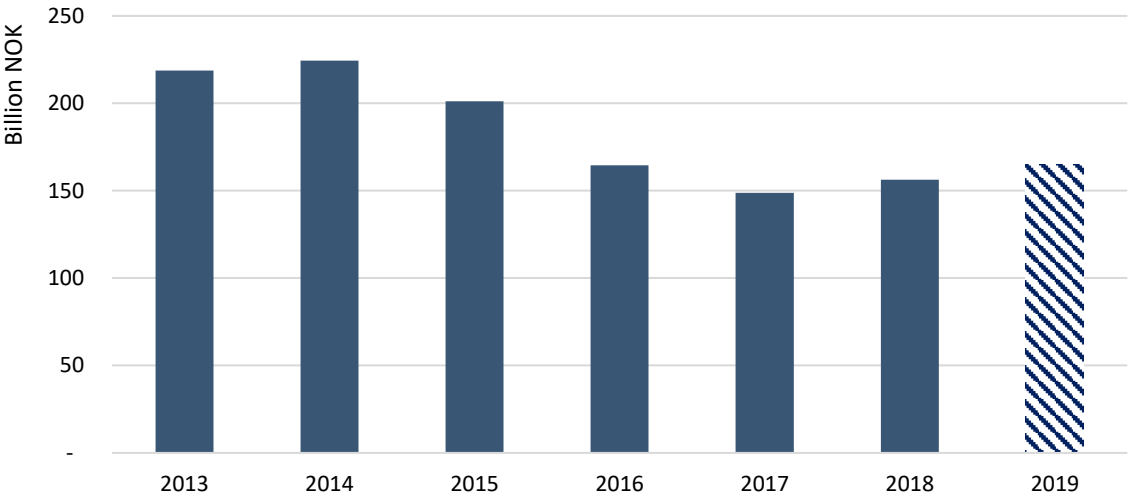
On the other hand, our survey shows that one in three cluster companies considers the passenger market as irrelevant for the company (see **Feil! Fant ikke referansekinden.**). The share of companies who finds this market segment to be irrelevant is higher than for any other segment. There are significantly fewer respondents that consider fishery and aquaculture irrelevant. Finally, offshore continues to be an important segment for the cluster

There are at least two possible explanations of how the companies view the market development. First, we assume the synergies between existing operations and the passenger markets to be smaller than for other segments (such as aquaculture). Moreover, fishery and aquaculture have a longer history in the region and many companies had a background in seafood before entering the offshore market.

This is also a telling story on how the cluster is approaching new markets, and how the cluster is changing away from the tightly integrated value chain centered around the offshore segment. While the passenger market appears to be interesting for some, this is not for everyone.

4.3. The offshore oil and gas market is expected to grow again, but is still affected by oversupply

Figure 4-6: Investments in oil and gas industry in Norway 2013-2018. Expected numbers for 2019. Source: SSB



Investments in the oil and gas industry fell dramatically in tandem with the oil price from 2014. It does seem like investments bottomed out in 2017/2018. Current estimates from the oil companies suggest an increase in investments by 6 percent from 2018 to 2019.

Moreover, according to our survey, 4 out of 10 companies believe that oil and gas will be more important for their business, while 15 percent believe that oil and gas will be less important in the coming years²¹. This is exactly

²¹ See Figure 4-3.

the opposite of last year's survey, where only 15 per cent believe that oil and gas would be more important in a 3-5-year perspective and 40 per cent believed that oil and gas would have a lower impact.

Still, most markets are characterized by over-supply. Especially the AHTS and PSV-market is hit hard. More than 100 Norwegian offshore vessels are laid up. In addition, there are still too many active vessels in the markets to drive up rates. AHTS and PSV rates have been at low levels throughout 2018. The current rates make it possible for shipping companies to cover operational costs, but the levels are too low to cover financial costs.

It is difficult to get overcapacity out of the market as laid-up vessels can function as a cheap "option" for owners hoping that rates will improve. In addition, there is virtually no steel value in an OSV. However, cold stacked vessels will deteriorate and could be costly to bring back to market. This will create a small barrier to enter and could lead to more scrapping.

There are more positive signs in the subsea-market. For instance, both Kleven and Vard signed contracts to build cable-layers in 2018. On the other hand, no new offshore vessels were ordered at Norwegian yards in 2016 or 2017.

4.4. Does the cluster have the right competence to succeed with the digital transformation?

An important element of the development in the maritime industry is the changes brought about by digitalization and automatization. The digital revolution includes a sharp reduction in prices at an exponential speed. This affects all segments in the maritime cluster in a fundamental way. An important question is whether the maritime industry has the right competence, capacity and willingness to change to exploit these megatrends to reduce costs, take new market shares and increase competitiveness.

The maritime cluster in Møre is recognized for its high level of competence, and hence it is in a good position to adapt and excel under these new market conditions. For instance, Menon and DNV GL have documented that the labor productivity in Norwegian yards is 20 times higher than in Dubai. However, with the high wage level in Norway in general, and in the maritime industry, the cluster needs to be productive, also in the future. To do this, the cluster would need to seek for market opportunities in markets where technology and innovation are central, which has been the strategy of the maritime cluster since the beginning.

The need to build competence and capacity to address the threats and opportunities inherent in the digital transformation is also addressed in the «Digital21»-strategy. One of its main messages related to the digitalization and competence gaps was that the industry needs to be more proactive and ensure a more flexible and agile working force.

An important question is therefore whether the cluster companies have the will to invest enough into building competence to exploit the new opportunities and divert the threats that come with digitalization. To some extent, digitalization per se is not a new trend as it has been going on continuously many decades. This new wave of digitalization, however, will demand fundamental restructuring of companies, including production processes, service deliveries, value chains and business models. These types of restructuring processes are risky, as there will be issues and challenges in this phase. The advantage of increased competitiveness should not be undermined.

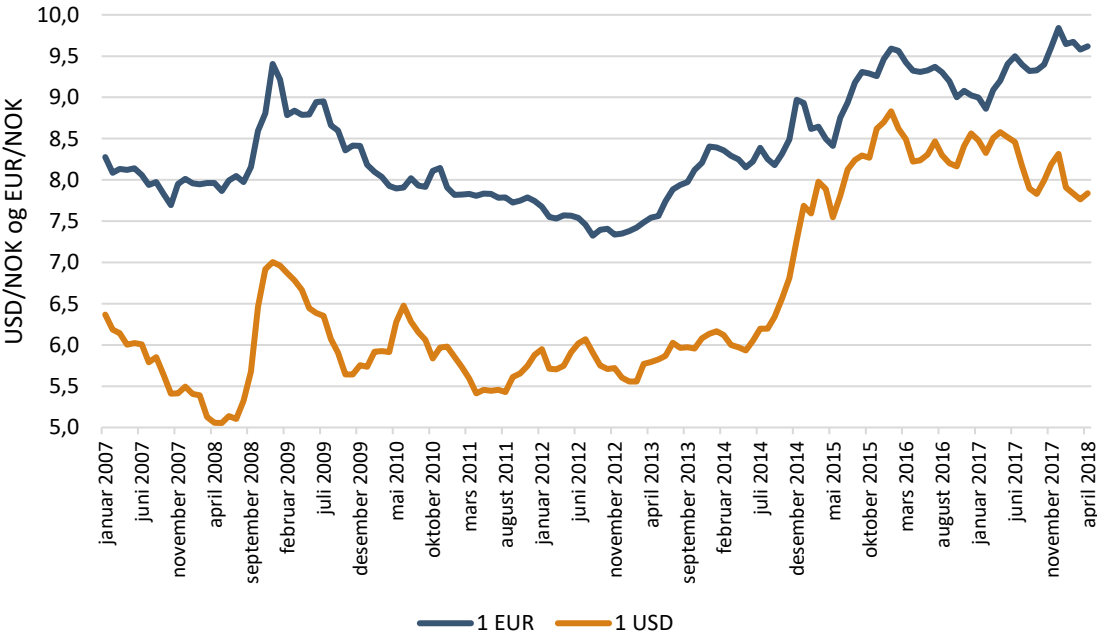
Use of big data and improved software creates the opportunity to optimize maritime operations. At the same time, there is a rapid development toward autonomous and «smart» ships. An interesting aspect is the arrival of

Kongsberg Maritime in the cluster, after it bought Rolls-Royce Marine. Kongsberg and Rolls-Royce are both on the forefront of the digital transformation. It will be interesting to see whether the knowledge spillover will allow other companies to learn and develop within this field.

4.5. The cluster continues to benefit from favorable exchange rates

The exchange rate has a strong impact on the cluster’s competitiveness. Since the summer of 2014, the NOK/USD exchange rate has spiked. Companies with revenue in USD and the majority of costs in NOK experience a positive effect on their competitive situation. The cost-disadvantage of Norwegian labor has shrunk – with wage cost constituting around a fifth of the turnover. On the other hand, companies also buy input factors from abroad, neutralizing some of the positive effect of a weak krone. Companies with revenue in NOK and the majority of costs in USD experience a negative effect, unless they are able to increase their prices in Norway (NOK).

Figure 4-7: Development in exchange rate with USD and Euros relative to NOK. Source: Central bank of Norway/Menon (2018).



From 2017 to 2018, the companies receiving revenues in euros have gained an advantage, while the NOK has strengthened against the USD. Still, we expect the total effect on the cluster to be positive, but this will vary between companies and segments depending on the share of revenue and costs that comes from abroad, and where it comes from. It will also depend on the company strategy for handling exchange rate risk. The changing market focus where the export market will increase in importance will mean that the exchange rate will be even more important for the competitiveness of the cluster.

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