

REPORT

# GCE BLUE MARITIME 2017 – GLOBAL PERFORMANCE BENCHMARK

**The maritime cluster reinvents itself – will it regain competitiveness and growth?**



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# 1. Introduction and main findings

2017 will be another difficult year for the cluster, and the third consecutive one with falling activity and profitability. Since 2015, value creation has fallen by almost 40 percent, and one in five employees has left the world-leading cluster. At the same time, we see some positive signs on the horizon. Throughout the last decades, the cluster has shown an impressive ability to reinvent itself. In the last two years, the cluster has again shifted its market focus and positioned itself in growing markets both within maritime tourism, fisheries and aquaculture. With regard to markets, the cluster is probably more diversified than ever before.

Looking at the key parameters benchmarked, we see that activity level, profitability and productivity are falling. Profitability is at an all-time low, and especially the shipping segment’s competitive situation has deteriorated. The loss of Farstad and Rem is a hard blow for this segment. In general, all segments have experienced a weaker development compared to national and international benchmarks during the last 3-5 years. This is partly due to the intense focus on the offshore oil and gas industry in the cluster. It is interesting to note that SMEs (Small and Medium-sized Enterprises) seem to handle the downturn better than the larger companies. This appears to be partly a function of SMEs being less dependent on the oil and gas industry (such as the smaller yards). Another reason could be that SMEs are more agile and better at adapting quickly to a new activity level or taking advantage of new market opportunities.

Figure 1-1: Overview of development in performance indicators, market situation and opportunities and challenges for the cluster going forward. Source: Menon (2017)

Key performance indicators	Market situation	Opportunities and challenges
<p><b>Activity-level in 2016 falling</b></p> <ul style="list-style-type: none"> <li>Value added: - 27 %</li> <li>Employment: - 11 %</li> <li>Turnover: - 20 %</li> </ul>	<p><b>Offshore market: still huge oversupply</b></p> <ul style="list-style-type: none"> <li>Huge influx of new vessels last 10 years combined with weak demand suggest prolonged period of weak demand</li> </ul>	<p><b>The financial situation has to improve in 2018</b></p> <ul style="list-style-type: none"> <li>Companies can not survive for long periods with low-margins</li> </ul>
<p><b>Profitability falling</b></p> <ul style="list-style-type: none"> <li>Net operating margin - 24 %</li> <li>Weak profitability in all segments</li> <li>SMBs perform somewhat better</li> </ul>	<p><b>The cluster has been successful taking positions in growing market</b></p> <ul style="list-style-type: none"> <li>-A more diversified market focus than ever before</li> </ul>	<p><b>New markets and digitalization creates a need for more cluster cooperation:</b></p> <ul style="list-style-type: none"> <li>Talent generation</li> <li>Develop new capabilities to conquered markets in the ocean space</li> </ul>
<p><b>Productivity falling</b></p> <ul style="list-style-type: none"> <li>Productivity keeps falling</li> <li>Mainly a function of low profitability</li> </ul>	<p><b>Lower activity means tougher competition for key orders and short-term low-profitability</b></p>	<p><b>Digitalization creates new opportunities</b></p> <ul style="list-style-type: none"> <li>The importance of having industrial locomotives like Rolls Royce Marine in the cluster increases</li> </ul>
<p><b>Competition</b></p> <ul style="list-style-type: none"> <li>Weaker performance against Norwegian benchmark since 2011</li> <li>The clusters shipping segment has lost market shares in the consolidation process</li> </ul>	<p><b>The cluster have a possibility to be profitable in new markets</b></p> <ul style="list-style-type: none"> <li>- still the transition will be difficult especially when companies are in a weak financial position</li> </ul>	<p><b>New owner- and supplier relationships create possibilities</b></p> <ul style="list-style-type: none"> <li>-Exploration cruise is an interesting niche market. It's success will depend on developing new relationships and capabilities and capitalize on these</li> </ul>

2017 seems to be another weak year for the cluster. Based on survey results, we estimate that turnover for 2017 will fall by another 10 percent and employment with 5 percent. That is before we include the effects from the SolstadFarstad merger. The yard segment has seen a small increase in orderbooks in 2017, but for most of the cluster, orderbooks have also fallen somewhat. This suggests lower future activity, but companies should already have lowered their activity level to adjust for this. Profitability is expected to stay low also in 2017, but

will probably not fall any further. The cluster needs to see a positive development in 2018 after losing an aggregated NOK 17 billion during the last two years. **Most of the companies in the cluster have refinanced**, but for long-term survival they will need to become profitable soon. Yards have successfully adapted to new markets, but we cannot expect to see high profitability here just yet. Losses from the downturn in the offshore markets are likely to have been realized by now. The recent refinancing of Kleven is hopefully the last example of this. This refinancing saved the cluster from large negative ripple effects, and hopefully Kleven will gain from the new ownership. Both Vard and Kleven now have owners that have long-term experience in the yacht/cruise-segment.

**Fortunately, it seems like 2018 will be the year when the tide turns.** Six out of ten companies believe that turnover will increase again, and eight out of ten expect to stabilize or increase employment. Near end-of-year 2017, we also see a few positive developments in the oil-related maritime markets, for instance through higher utilization rates for offshore vessels. Another very important development in 2017 is the announcement of a NOK 2 billion R&D-investment by Rolls-Royce Marine. Some of these investments will be canalized to Rolls-Royce's new fleet management center in Ålesund. Rolls-Royce is a key player in the cluster and positive signals from this company are therefore very positive for the future development of the whole cluster.

A key feature of the cluster has been the fact that the companies have been tightly integrated throughout the value chain. This has been an important competitive advantage since the companies have been able to take advantage of agglomeration effects and upgrade their innovative capabilities. At the same time, this interdependency has now led to the whole cluster struggling. When offshore shipping companies and yards struggle, the consequences are quickly felt further down the value chain. **The new mapping of buyer-supplier relationships illustrates that the internal customer-supplier relationships are weakening.** The economic dependency of other cluster companies is falling. This could be positive since new capabilities will need to be developed to be successful in new market segments. At the same time, it will also challenge the future innovative power of the cluster.

**We believe that one way of improving the cluster's future performance is through increased cluster cooperation.** New markets and digitalization processes create a need for more cooperation among the companies in the cluster. In this way, they can take advantage of agglomeration effects – both by tapping into and developing a common talent and knowledge pool in the cluster, and by being more cost-efficient when it comes to input factors. This will also be a way to quickly spread competence and abilities about new market applications throughout the cluster.

### 1.1. Will the cluster be able to reinvent itself?

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 companies, a collaboration characterized by dynamic relations with high interaction. 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 cluster has historically demonstrated a remarkable capability for strategic transformation through both company- and cluster-based innovation. The collective knowledge that innovation relies on – carried by firms and research institutions and spread among them through buyer-seller relations, cooperation, informal communication and mobility of people – is strong in the Møre region. In addition, the critical mass that the cluster has gained in the last decade has made it much more robust to adverse shocks than ever before.

Although the Møre cluster has achieved an impressive performance over the last ten years, the three fundamental questions about future competitiveness raised last year are still valid:

- 1) **Productivity:** Since 2009, productivity in the cluster has stagnated, while the rest of the offshore-oriented part of the maritime industry in Norway has improved productivity. *Why has productivity stagnated, and how will that impact competitiveness going forward?*

**The value chain is challenged:** The most distinguishing feature of the Møre cluster has been the tight value chain structure, with internationally competitive companies within the local cluster in all steps in the value chain. In last year’s report, we stated that these vertical structures were under pressure. We now see a new reality where the offshore shipping companies have consolidated, and where much of the ownership and headquarters are centralized outside Møre. Because of the market realities in the offshore market, offshore owners are now less relevant for the cluster. The situation where most of the activity is based on foreign owners will probably be the new normal for the cluster. The focus on cruise has also led to the creation of new supplier relationships with suppliers outside of the cluster. The tight value chain structure is in other words weakened. *The question is still how cooperation, knowledge flows and cluster-based innovation will be affected when the buyer-seller linkages in the value chain are broken. Another question is whether the linkages will be restored by new and existing shipping companies going into new ocean markets?*

- 2) **There is a need for more standardization and cost-efficient mass production:** The Norwegian maritime industry, and the Møre cluster in particular, have been in the forefront of the technological breakthroughs and innovations for new ship types and equipment for many decades. It is important to emphasize, however, that yesterday’s innovations are today’s standards, because customers will require standardized solutions to reduce their own costs. All parts of the cluster now see a need to cut costs and either increase volume or develop innovative new goods and services mostly to new market applications. Still, investments in new products are difficult when the whole cluster is financially distressed. The last two years saw the cluster finding attractive market opportunities in growing segments. *The key question that will be answered in 2018 is whether the companies will be able to capitalize on their innovation capabilities in these segments and be profitable.*

This report gives insight into how the reinvention process is developing. It also provides some initial positive indications that the cluster will be able to reinvent itself and be an important driver in the future development of ocean-based activities.

**1.2. Introduction: Møre is home to a leading ocean-based cluster**

In the remainder of this report, we will divide the 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 together with other companies offering specialized services. A selection of the leading companies within the four areas is shown above to illustrate the width of activities in the cluster.

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



## 2. Key developments in the Blue Maritime cluster

This chapter describes developments in key parameters measuring activity, profitability and productivity in the overall cluster. Summarized, the activity level has fallen dramatically over the last years, and is expected to fall further in 2017. Value added is reduced by 40 percent in the last two years, employment is reduced by a fifth, while profitability hit an all-time low in 2016. The positive development in productivity seen in the beginning of this millennium has also halted since 2009. A reduction in activity level is natural after a period of strong growth, but restructuring the cluster will challenge the companies that make up the cluster. The value chain in the world-leading cluster is weakened and new digital solutions are challenging existing products and production processes. This is further complicated by the need to adapt to a changing market. The frail financial position that many cluster companies are in makes it a challenge for the cluster to invest in future growth. Still, there are signs that 2018 will be the year where activity will grow again.

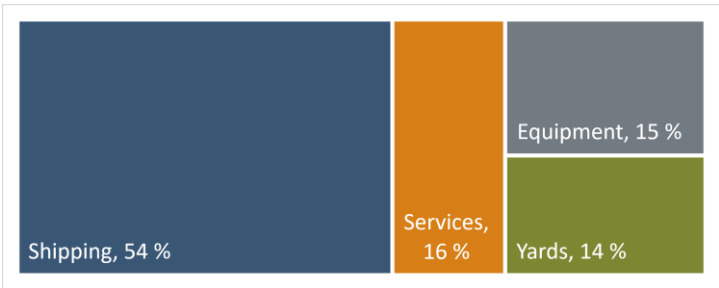
Figure 2-1: Key financials for the cluster 2015 & 2016. Source: Menon (2017)

	2015	2016	Change (absolute value)	Development (in percent)
Turnover	65.5	52.5	-13.0	-20 %
Net Operating Margin (EBIT)	-6 %	-24 %	-18 %	
Employment	16 700	14 900	-1 800	-11 %
Value added	22.3	16.2	-6.1	-27 %

### 2.1. The cluster’s activity level has been falling as the offshore market has collapsed

The Møre cluster was on a continuous growth path for more than a decade before activity started falling sharply in 2014. In the last two years, total value creation in the cluster has fallen by almost 40 percent. This fall has been experienced in all segments since the demand from the cluster’s main market (offshore oil and gas activities) has collapsed. Restructuring does not only affect the activity level. Profitability has also fallen sharply. While the average operating margin (EBIT margin) the last ten years has been around 10 percent, the margin for the cluster overall fell to -24 percent in 2016.

Figure 2-2: The four segments’ share of value creation in the Møre cluster. Source: Menon (2017)



The cluster has throughout its history shown a remarkable ability to reinvent itself, but this process is never easy. The last two years have seen especially the shipping part of the cluster deteriorate. The establishment of SolstadFarstad means that local ownership in the shipping area is considerably weakened. Recent developments also indicate that the scope of operational activities in the cluster conducted by Farstad and Rem (now part of SolstadFarstad) will decrease further. Another challenge for the cluster is the financial stability of companies in the cluster. Three years of financial difficulty have put many companies in a distressing financial position. This

was most recently seen in the case of Kleven, where customers and local investors had to strengthen the yard's capital base.

However, the cluster still plays a key role for the industry in Norway and as a contributor to the regional economy. In 2016, the companies in the cluster generated a turnover equal to NOK 53 billion and a value added of 16 billion. Close to 15 000 people were employed in the cluster, making it the most important contributor to employment in Møre and Romsdal (excluding public administration).

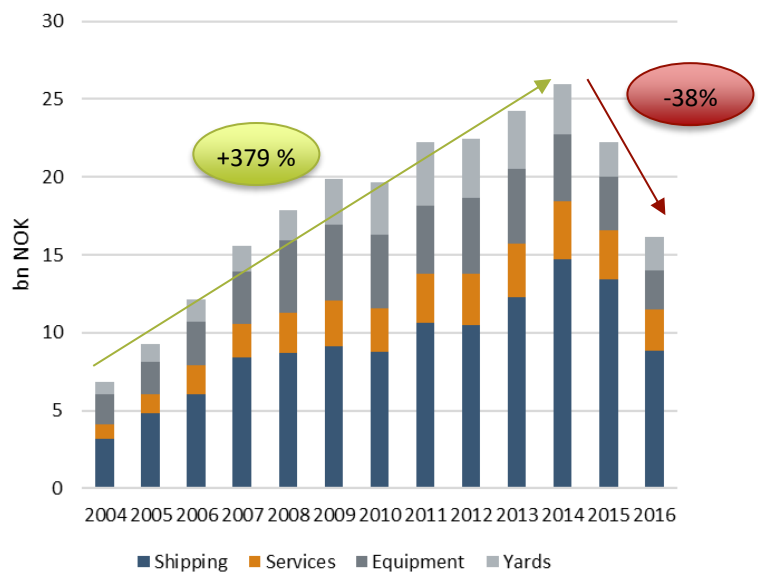
The cluster is still home to world-leading companies that can be divided into four main segments – four steps in a complete value chain from design to operation of complete vessels in different market applications. Their respective shares of the value added have remained relatively stable over the last years. In 2016, shipping constituted the majority of the value added, but its share has fallen during the last two years, and will continue to fall in 2017. The equipment manufacturer's share of value added has also fallen from around a quarter of the value added before 2010, to 15 percent in 2016. The value added contributions of the individual segments are shown in the figure above.

## 2.2. Activity in the cluster keeps falling

The most common way to measure activity is probably turnover. Value added is in many ways a better measure since it is not influenced by internal purchases along the value chain (see text in the box below for more information). Looking at the development since 2006, we see a vast growth in value added. The cluster more than doubled its value creation from NOK 12 billion in 2006 to NOK 26 billion in 2014. The activity level grew as the cluster managed to secure contracts for building, equipping and operating mainly offshore vessels. From 2014 to 2016 however, the cluster was hit hard by lower activity in the offshore oil and gas market.

From the figure above, we can observe that the manufacturing side of the cluster – yards and equipment producers – reached a peak already in 2011 and 2012, while the shipping companies secured an increase in value added for the cluster as a whole through strong growth in 2013 and 2014.

Figure 2-3: Development in value added for the cluster 2004-2016. Value added is split between the shipping industry and the rest of the cluster. Source: Menon (2017)



## 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. Thus, Value added is 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 to the key stakeholders in the industry, meaning employees through wages, government through taxes, creditors through interest payments on loans, and owners through profits.

### 2.3. Revenues have fallen by more than NOK 20 billion since their peak – declining in all segments

Change in turnover 2015-2016. Source: Menon (2017)

In 2015, however, turnover fell by NOK 8 billion before falling another 12 billion in 2016. This is a sharp contrast to the previous ten years, when the aggregated turnover for the entire cluster doubled from 37 billion NOK in 2006 to 74 billion in 2014. The sharpest decline in turnover since the peak in 2014 is found among yards. For this group, turnover is reduced by a third, five percentage points more than the cluster average. All segments have seen a double-

	2015	2016	Change (bn NOK)	Change (%)
Shipping	19.2	14.2	-5.0	-26 %
Services	11.6	10.0	-1.6	-14 %
Equipment	15.3	1.9	-3.3	-22 %
Yards	17.0	15.1	-1.8	-11 %
Total	65.5	52.6	-13.0	-20 %

digit reduction in revenue the last year, but in 2016 the reduction was the strongest in shipping companies where a quarter of the revenue was lost from 2015 to 2016. The reduction in activity for the shipping companies is a function of both lower activity and lower rates. The reduction will probably be even stronger for this segment in 2017. This is partly due to low activity and low rates, but mostly a consequence of Farstad and Rem moving most of their activity to the new headquarter outside of the cluster.

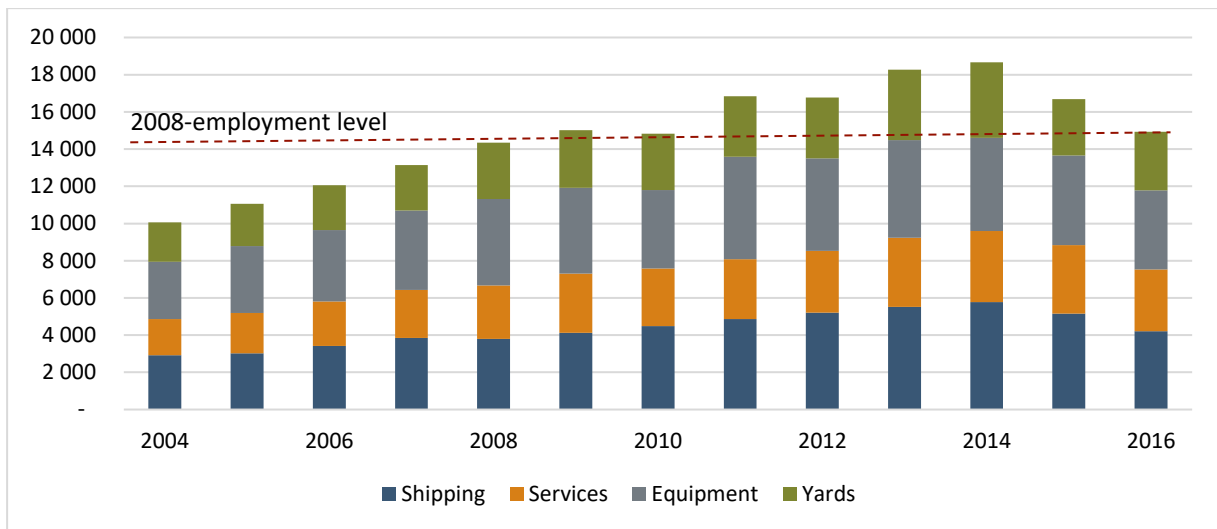
### 2.4. One out of five employees have exited the cluster since 2014

Cluster employment fell just below 15 000 people in 2016. This is 5000 more than in 2004, but still a reduction of 11 percent during the last year. Since the peak in employment in 2014, one in five employees has left the industry. Employment is now back at the pre-financial crisis-level. The fall has been especially strong for shipping companies (-27 percent) while service providers and equipment producers have seen a smaller reduction of about 15 percent. In 2016, all parts of the cluster except the yards experienced a double-digit reduction in employment. In 2016, the equipment producers passed shipping companies as the most important segment for employment.

During the last two years, 3700 people or one out of five employees have left the cluster. That is almost 3 percent of the workforce in Møre and Romsdal. Still, the unemployment rate in the county has not increased but fallen over the last two years (NAV-statistics). This is probably a function of a strong labor market in Norway in general and a reduction in foreign workers in the country.



Figure 2-4: Cluster employment 2004-2016 split on segments. Source: Menon (2017)

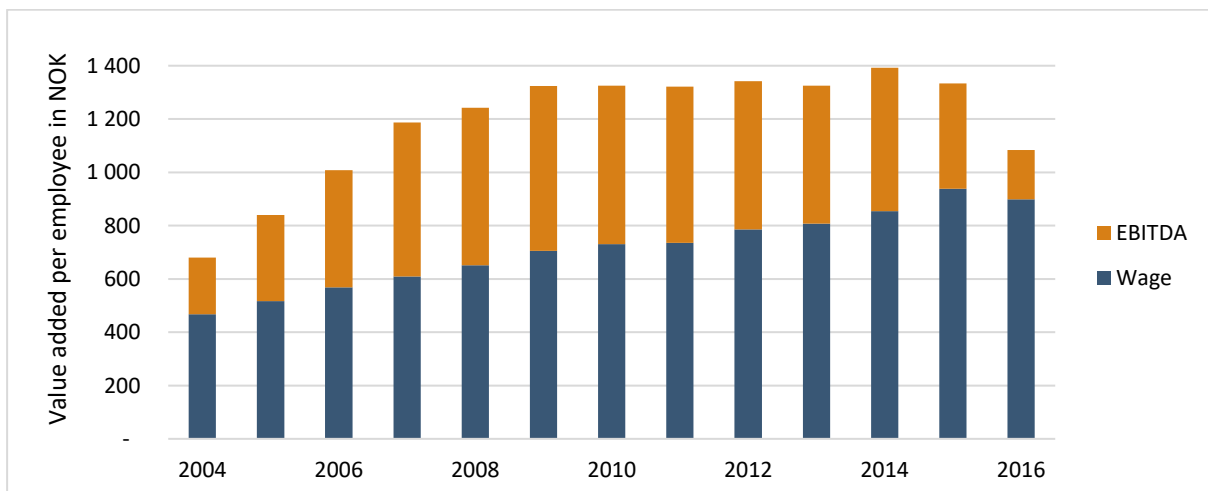


## 2.5. Productivity development has been weak since 2009

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. Decomposing value added, EBITDA per employee has fallen since 2009, while wage cost per employee has risen.

Value added per employee is not a perfect measure of productivity as it should be adjusted to price changes in the final market. Still it gives an indication on productivity development, especially seen together with other measures such as profitability. Productivity is far too low to maintain competitiveness in the cluster. We have already seen that the total net operating margin (EBIT) in the cluster was negative in 2016, which implies that the entire EBITDA was spent on depreciation and amortization, leaving nothing to cover financial costs. A related indication of reduced competitiveness is the fact that the EBITDA share of value added was close to 50 percent in the years from 2006 to 2011, while it has decreased to 17 percent in 2016.

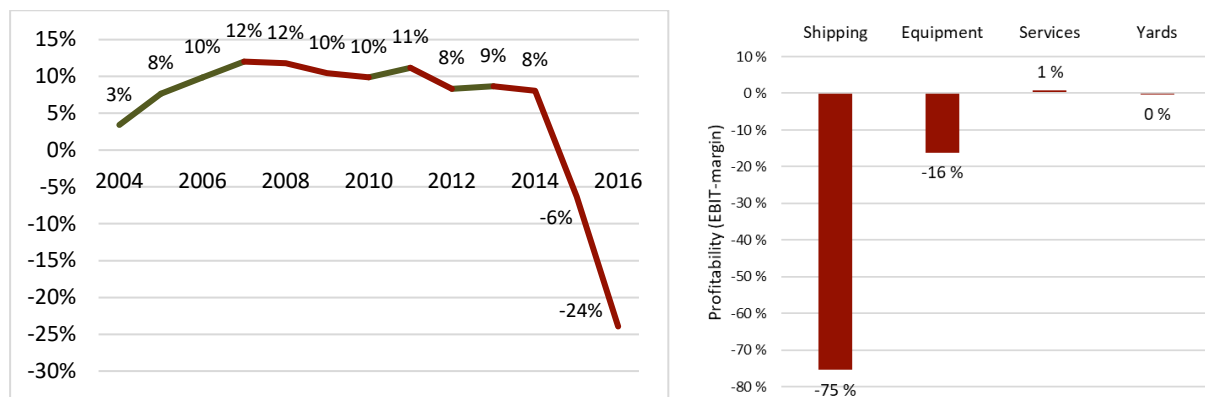
Figure 2-5: Value added per employee split between wage costs and EBITDA 2004-2016. Source: Menon (2016)



## 2.6. The cluster has now experienced negative profitability for two consecutive years

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 seen 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 2-6: Left: Net operating margins (EBIT) for the cluster in total. 2004-2016. Source: Menon (2017). Right: Net operating margins (EBIT) at segment level in 2016. Source: Menon (2017)**



The cluster as a whole saw the operating margin growing rapidly to a peak of 10-12 percent in 2006-2011. After the financial crisis, profitability remained high, but has gradually decreased from 10-12 to 8 percent in 2014. In 2015, the aggregated profitability dropped sharply to negative 6 percent before falling further to negative 24 percent in 2016. In 2016, all segments except services delivered negative profitability. Shipping saw an extremely low profitability of -75 percent. The low profitability can mainly be explained by the large write-downs on vessel values and high financial costs, but the EBITDA level was also low at half of the 2015-level. Equipment and yards also delivered negative profitability in 2016. Profitability in the different segments is furthered described in the segment-specific parts of this report.

### 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.

## 2.7. The financial situation is difficult for most parts of the cluster

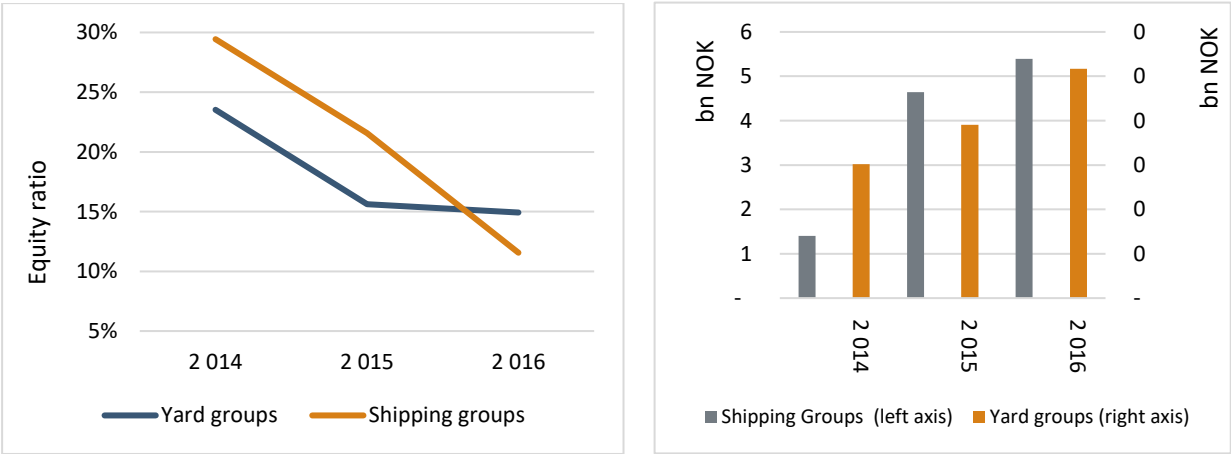
Figure 2-7: Accumulated profits (EBIT) at segment level for the cluster in the last two- and four-year periods. Source: Menon (2017)

Profitability also affects the financial position of the companies in the cluster. In the last two years, the cluster has accumulated a loss of almost NOK 17 billion. A positive result is needed to pay for interest and pay profits to the owners. Most of the negative profits have been in the shipping segment and this has led to several key companies exiting the cluster. Weak profitability will over time lead to reduced financial stability for the cluster. The yards and service providers have seen weak profitability during the last two years, but overall positive profits in the last four years mean that they should be in a better financial situation than the shipping companies and the equipment segment. The equipment producers also have large negative results both in a two and four-year perspective. It is important to remember that many small and medium-sized companies in both the yard segment and equipment segment have delivered much better results, making their financial situation brighter than what the average would indicate.

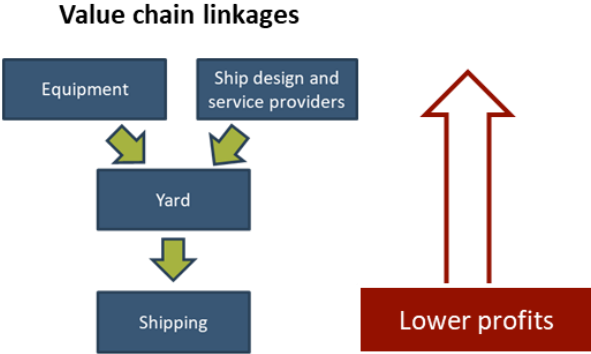


Measuring the financial stability of a whole cluster is difficult, but the left-hand figure below illustrates how the equity ratio for both shipping companies and yards in the cluster has fallen sharply since 2014. Working on this study we also analyzed how working capital has developed during the last two years for these two groups. Both these indicators suggest that the financial position of these two groups is weakening. The figure on the right demonstrates how financial losses due to impairment losses, increased amortization and depreciation have accelerated between 2014 and 2016.

Figure 2-8: Equity ratio for yards and shipping groups in the cluster 2014-2016. Right: Depreciation, amortization and impairment loss for yards and shipping groups in 2014-2016. Source: Menon (2017)



The weak profitability for shipping companies and yards is spread along the value chain. The figure to the right illustrates how lower profits in the end market are “pushed” through the whole value chain. Lower activity in shipping markets is transferred to yards and further to suppliers. The effect of this is increased pressure on profitability for the whole supply chain. Suppliers are often faced with the dilemma to either keep activity up and accept lower profitability or to cut activity drastically. The effect on the whole cluster is an extreme focus on cutting costs along the supply chain.



One effect of the low profitability and weak financial position of companies in the cluster will probably be future consolidation among suppliers to cut costs and increase volume. In connection with this report, we conducted interviews with cluster companies. Some interviewees suggested that there are too many companies focusing on the same niche markets. In general, there was a clear focus on cutting costs while still developing new goods and services and products towards new market applications. This is necessary for the cluster to reinvent itself, but it is a difficult process. We believe that one way to solve this will be to further increase cluster cooperation. This should happen both by taking advantage of the width of the local knowledge-base when developing new products, but also by taking advantage of cluster cooperation on the supply side. The latter could be achieved for instance by common talent recruitment or by increasing purchasing power by developing purchasing networks.

**2.8. Development in 2017 is negative, but activity level may have bottomed out**

Turnover and employment are expected to fall further in 2017 compared to 2016. The survey data collected from the companies suggest that employment will be reduced by 5 percent in 2017, while turnover will fall by double.<sup>1</sup> That suggests that 2017 will be the third consecutive year with falling activity for the cluster. At the same time, the fall in turnover and employment will be half of what the cluster experienced in 2016.

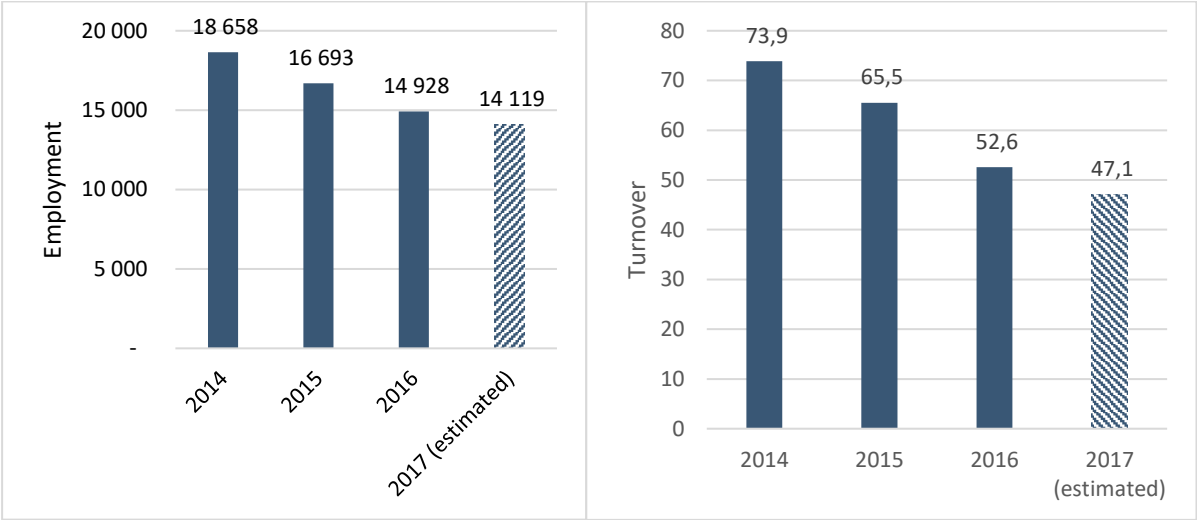
The development in 2017 varied both between segments and within segments. Yards and shipping companies are expecting the largest fall in turnover. Depending on how the new SolstadFarstad company registers its activities, the shipping segment might see a reduction of up to 35 percent if the company moves more of its activity to Solstad’s head office outside the cluster. Equipment manufacturers and service providers combined expect a more modest 4 percent reduction in turnover. In this segment, there are large differences in expectations for 2017. The smaller players in this segment are actually expecting a higher turnover in 2017 than in 2016.

In this year’s survey, we also asked companies about expected profitability in 2017 compared with last year. The picture painted by the companies was not very optimistic. Four out of ten respondents expect profitability to fall, while six out of ten believe profitability will increase or stay at the same low level as in 2016. The shipping companies were especially negative.

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<sup>1</sup> This is not adjusted for change in SolstadFarstad. This will probably reduce turnover by another billion NOK or more.

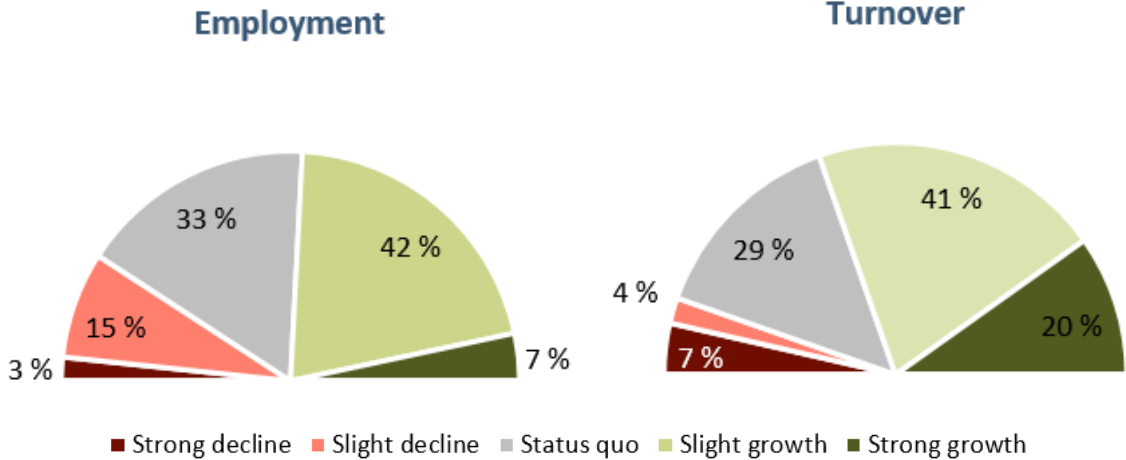
**Figure 2-9: Development in employment (left graph) and turnover (right) for the cluster in 2014-2016 and expectations for 2017. Source: Menon & survey data**



Looking at expectations for 2018, we see that the cluster companies are much more positive to developments in 2018. Only one out of ten companies reports expecting a lower turnover in 2018, and only 18 percent are expecting a fall in employment. We have to highlight that there are large differences between segments and companies, but the general tendency is captured well in the figures below. This is a very important sign for the cluster. In the interviews conducted in connection with this report, many interviewees highlighted that the restructuring process has been very difficult and that some signals on further growth were needed. Hopefully, activity in the cluster will have bottomed out in 2017 or by 2018.

The outlook for 2018 is not only positive. Four out of ten companies have seen order books being reduced in the last 12 months, suggesting that activity going forward will be lower than earlier. Still, we believe that the overall positive attitude as seen by the two graphs below is representative of an general optimistic outlook for 2018.

**Figure 2-10: Expected development in employment and turnover for 2018. N=60/56. Source: Survey data**



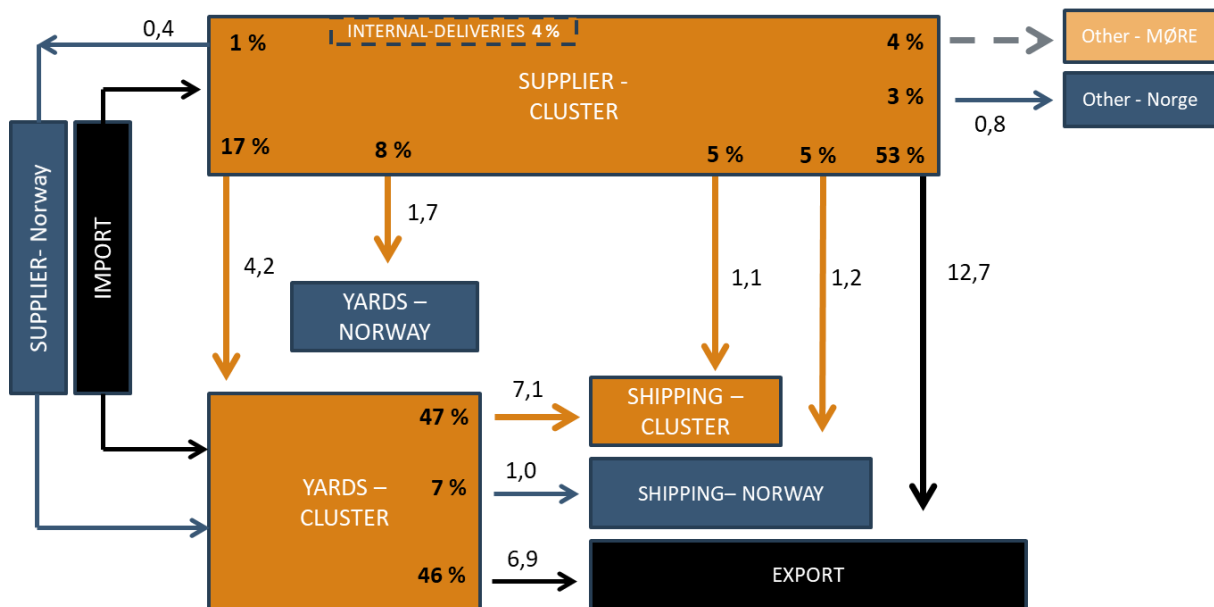
## 2.9. The tightly integrated value chain is changing

One of the key benefits of clusters is that companies are located in the proximity of key customers and suppliers. This makes it easier to exploit cluster advantages. Demanding customers are one of the most important sources for innovation, and proximity to customers is important for the strength of innovation pressure. The pressure since spreads to all product and factor markets where there is sufficiently intense competition. Since companies that are exposed to innovation presses themselves become demanding customers in their own supplier markets. Another advantage is on the input side. Companies can take advantage of competence that circulates in the cluster companies.

The illustration below quantifies the different customer-supplier relationships. For instance, yards in the cluster derive 47 percent of their income from shipping companies in the cluster in 2016. This makes local shipping companies the most important customer group for yards. For suppliers, the largest customers are found outside the cluster. More than half of their products and services are sold abroad. Still, 25 percent of their income is generated by companies in the region (including internal deliveries and companies with other than maritime activities). The numbers in the figure illustrate the total size of purchases/sales within the cluster and between the cluster and other groups.

Møreforskning did a similar mapping in 2013. Since then, we have seen a large increase in deliveries from yards to foreign customers. In 2013, only 3 percent of deliveries were to foreign shipping companies, compared to 46 percent in 2016. We also see that imports are becoming slightly more important for both suppliers and yards, while suppliers are less dependent on deliveries to yards in the region and have been increasing their exports. These changes can be explained by changing market focus. Since offshore shipping companies in Møre have stopped ordering vessels, they can't drive activity for the cluster. Other local shipping owners focusing on ferries, fisheries or aquaculture can still contribute with activity in the future. Cruise operators are (with the exception of Hurtigruta) exclusively foreign. This means that for yards, the export market will probably increase in importance going forward.

Figure 2-11: Buyer-supplier relationships in the cluster for 2016. Source: Menon (2017)



On the supplier side, the focus on exploration cruise will probably lead to a somewhat higher import rate as many of the key suppliers are located in Europe. Quite a large share of the total value of these vessels is made up by the interior, and here local suppliers are currently unable to deliver complete systems. On the other hand, many local suppliers are well positioned to deliver larger shares of the equipment for vessels operating in fisheries or aquaculture. Here we also see that both Havyard and Vard are well-positioned to deliver equipment to their own vessels.

### 3. Market developments highlight why the cluster must reinvent itself

For the last decade, the Blue Maritime Cluster has increasingly focused on designing, building, equipping and operating offshore vessels. This has been a successful strategy for many years, but in the current market environment, this dependency on a single market is a weakness. Market developments make it look unlikely that the oil and gas market will demand more offshore vessels in the coming 2-3 years. However, there are huge opportunities in the ocean industry – an industry that is expected to double its global value added in the coming years.

#### 3.1. The offshore crisis can be explained by fundamental economics

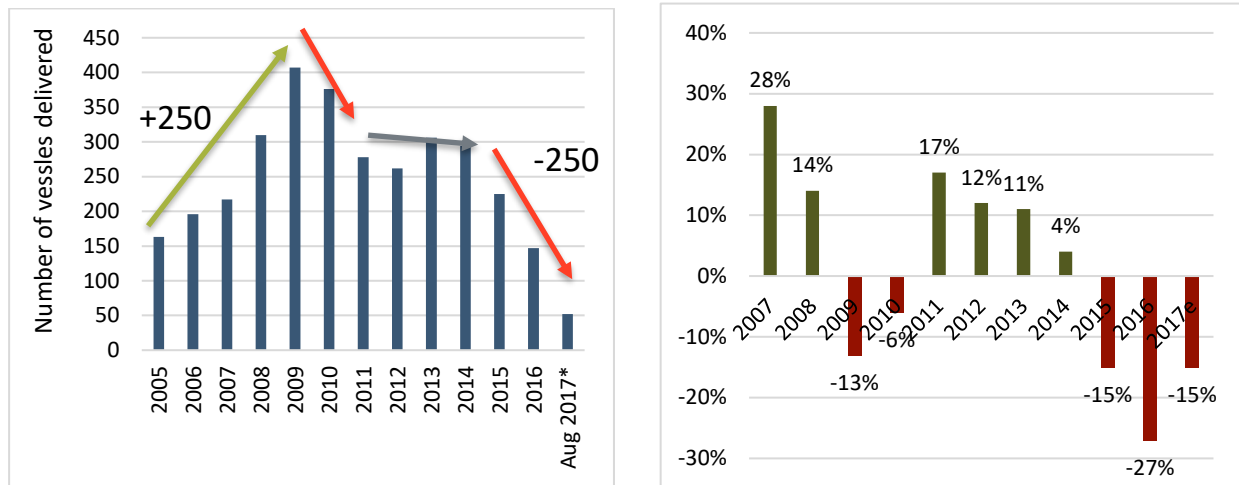
The weak offshore oil and gas market can be explained by imbalances in supply and demand in the offshore market. The oil price is the main driver of investments in the offshore oil and gas industry. In mid-2014, the oil price started to fall from a level of over 100 USD/barrel to just below 30 USD/barrel in the beginning of 2016. Since, the oil price has recovered somewhat, and oil was traded at around 50 USD/barrel in 2017. This sizeable fall in the oil price has led to large decrease in the demand from oil operators such as Statoil for deliveries from the offshore supplier industry. Operators' spending on exploration and production fell strongly from 2014 to 2015 and has fallen further in 2016 and 2017 (as seen in the graph below to the right). 2018 is expected to be the bottom year for the demand side according to many analysts (Rystad, 2017), but the oil price and the resultant activity level are not expected to grow quickly. One reason for this is that land-based shale production has a negative impact on the oil price.

On the supply side, there has been a huge increase in capacity over the last few years. The number of offshore service vessels entering the market has increased from an average of about 100 new vessels in the decade before 2007 to more than 300 offshore supply vessels in the following 10 years. The combination of an enormous increase in supply and lower demand has led to a huge oversupply of vessels. Depending on which vessel types you include, around one third of all offshore vessels are currently laid up, and fleet utilization is only at around 50 percent. This combination of low utilization rates and a relatively slow recovery (unless the oil price starts moving quickly upwards) is clearly preventing a market recovery. This also means that demand for new OSV-vessels built at yards is very low and will probably stay so for the coming years. Something that can create a faster market-recovery is if many vessels never re-enter the market. It is costly to take a laid-up vessel back into operations.

According to a report from the ship brokers Hagland Offshore, 80 out of 110 Norwegian laid-up PSVs (Platform Supply Vessels) do not meet the current requirements for tender for assignments in the North Sea. The 80 ships have an estimated construction cost of NOK 16 billion. 46 of these vessels must renew class during 2017 before entering the market again. The ship must be checked in dry dock, which costs the shipping company more than NOK 10 million. With current market rates, many shipping companies are not willing to take those costs. That means that many of these vessels will be scrapped instead of re-entering operations. If this happens, an improvement in market balance will occur much faster.



Figure 3-1: Number of OSV-vessels delivered from yards globally 2005-aug 2017 (left). Source: Clarkson/Menon. Change in offshore E&P spending from previous year (right). Source: Danish Ship Finance



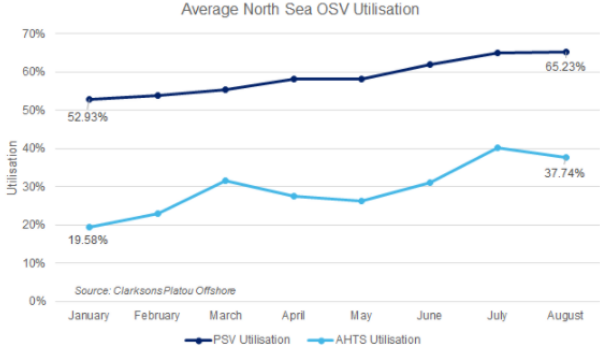
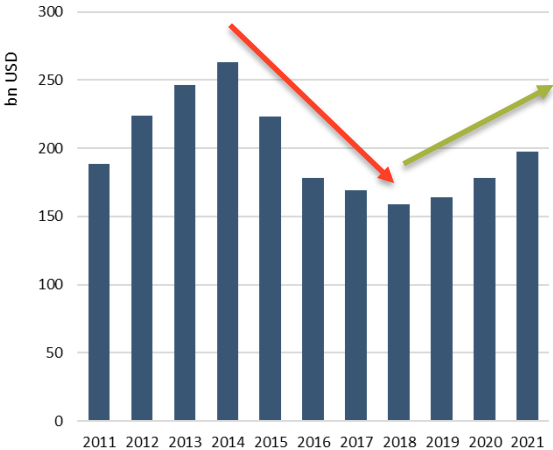
For the Norwegian industry, the falling demand was amplified by problems in what were expected to be growth markets in Brazil and Russia. Norwegian deliveries of services have been hampered by the Petrobras corruption scandal in Brazil combined with other institutional problems. Russia was considered another growth market, but this market was closed by sanctions from the EU after the war in Ukraine. This exaggerated the imbalance in demand/supply even further.

### 3.2. After a deep fall, the short-term outlook for offshore oil and gas seems somewhat more promising

Global offshore exploration and production expenditure has fallen dramatically since the peak in 2014. The Norwegian market has fallen by more than 40 percent during the last four years, according to Rystad Energy (2013-2017). The Norwegian market is expected to fall further in 2018, but will then bottom out and start to rise in 2019 (Rystad, 2017 & SSB (2017)).

One sign that the OSV-market is bottoming out and may slowly start to improve is that the demand for OSV-vessels in the North Sea has increased in September this year for the first time in 3 years (Kepler Cheuvreux and Clarkson Platou). According to analysts, the rates are slowly recovering, though from record low levels. The utilization level in the North Sea has also increased somewhat in 2017 (see data from Clarkson Platou below).

**Figure 3-2: Expected change in key markets for the Norwegian oil and gas supply industry (left). This covers 70 percent of the world market. Source: Rystad (2017). Average North Sea OSV Utilization in 2017 (right). Source: Clarkson Platou.**



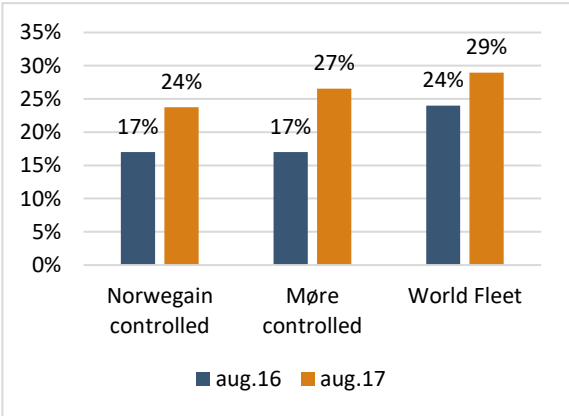
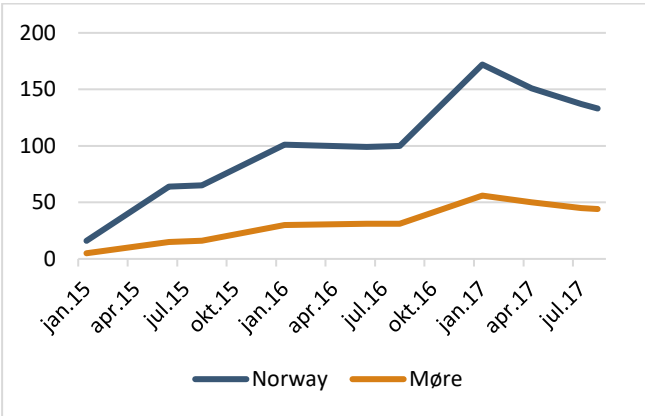
Graf: Clarksons Platou

**3.3. The number of vessels laid up may have reached its peak**

The number of laid-up Norwegian offshore vessels increased dramatically from the beginning of January 2015, and reached 100 vessels a year later. After stabilizing, the number of vessels increased again in the end of 2016 and peaked early in 2017 at more than 170. Since then, the number of laid-up vessels has been falling, but more than 130 vessels are still laid up in the end of August 2017.

Data from Clarkson also makes it possible to estimate the respective share of the fleet laid up for shipping companies in Møre, Norwegian owners and the globally. It indicates that the share of fleet that is laid up has increased compared to the same date last year. It also indicates that Møre’s share<sup>2</sup> of laid-up vessels has increased by more than the share for the Norwegian fleet in general. However, Møre is still performing better than the world fleet.

**Figure 3-3: Number of laid-up Norwegian vessels January 2015 to August 2017 (left). Source: Opplagsregisteret/Sysla.no. Share of fleet laid up in august 2016 and 2017 (right). Source: Clarkson/Menon (2017)**

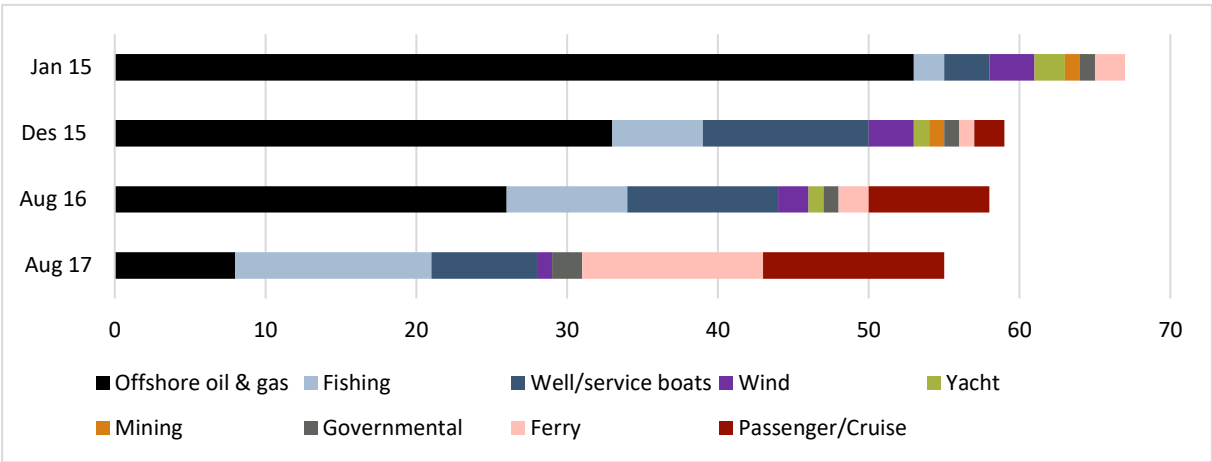


<sup>2</sup> There is some uncertainty when it comes to Møre’s share as it is difficult to split Rem and Farstad vessels from the new SolstadFarstad fleet.

### 3.4. The shift towards new markets is continuing

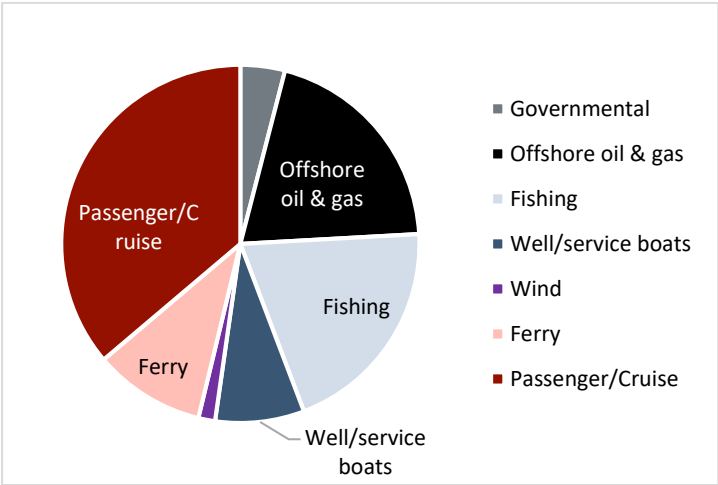
In line with lower demand from offshore oil and gas markets, the cluster has made a clear shift towards more diversified operations. This can for instance be seen in the order books of Norwegian yards, which are much more diversified today than only two years ago. The number of new orders for offshore vessels has been around 20 annually for Norwegian yards over the last decade. After only seven contracts for offshore vessels were made in 2015, the decline has continued in 2016 with zero new contracts. The offshore market is however still important to many companies since the after-market is large. For many equipment manufacturers, more than half the turnover and most of the profit is made in the after-market making it a relevant market still.

Figure 3-4: Order book at Norwegian yards January 2015-August 2017. Number of vessels (larger than >40m). Source: Norsk Industri



The previous figure only shows the number of vessels. Looking at the value of vessels in the orderbook gives a slightly different picture.

Figure 3-5: Value of orderbook in September 2017 split by type of vessel. Source: Norsk Industri (2017)

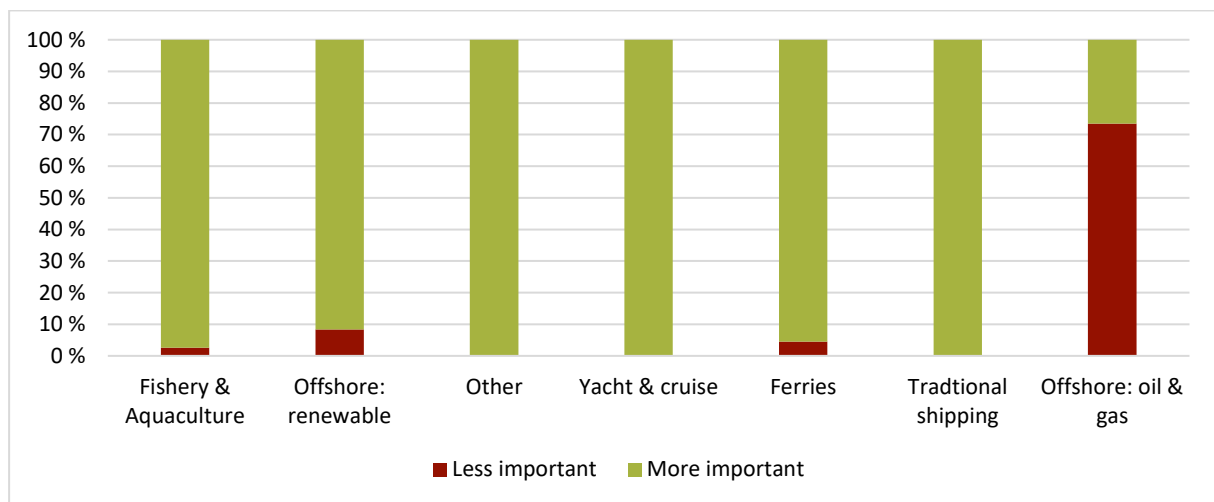


Looking at the total value of orders tells us something about expected future activity. Going back to 2013, the value of orders has fallen by a third compared to today’s orderbook of NOK 22.8 billion (September 2017). The

development within the year has been positive though. Since the beginning of the year, the value of orders has increased by 8 percent.

The changing orderbook seems to reflect how the companies in the cluster see the growth perspectives in different maritime market applications. Offshore oil and gas is seen as increasingly less important, while most companies see fisheries and aquaculture as an important growth area. Yacht, cruise and ferries are also increasing in importance. It is also interesting that “other” scores quite highly. This could be a sign that more companies are looking for growth opportunities outside of maritime applications.

**Figure 3-6: Will the following markets become more important for your company? Source: Survey data/Menon (2017)**



### 3.5. Will the cluster be able to stay profitable in new markets?

The cluster has reinvented itself many times, but for the last twenty years approximately 85 percent of the vessels delivered have been offshore vessels. That means that yards (and most of the cluster) in general have focused on a single type of vessel when building ships. 2016 and 2017 were the first years in more than a decade where there were no offshore vessels ordered at Norwegian yards. In 2017 and in the coming years passenger transport (cruise, ferries and yachts) together with fisheries and aquaculture will be the new main markets. The question is if the yards will be able to compete and be profitable in these new markets.

When interviewing yards, service providers and equipment manufacturers, they acknowledged the difficult situation the cluster is in. At the same time, they seem optimistic when it comes to the new markets they are moving into.

For the fishing/aquaculture segment international competition is hard, but Norwegian yards have been able to take a sizeable part of the market. This means that they have delivered competitive bids in an international market with competitors in countries such as Turkey, Spain and Denmark. The second question is then if they will be able to deliver positive margins on these contracts, or if they have been too focused on keeping activity at a stable level. Talking to the respondents, they are positive when it comes to their ability to deliver positive results in this area. At the same time, they acknowledge that competition within this area is fierce and increasing, something that probably will drive down margins.

When it comes to exploration cruise, ferries and yachts, Norwegian yards have some advantages that make it possible for them to exploit the cluster’s competitive advantages. The exploration cruise niche currently sees

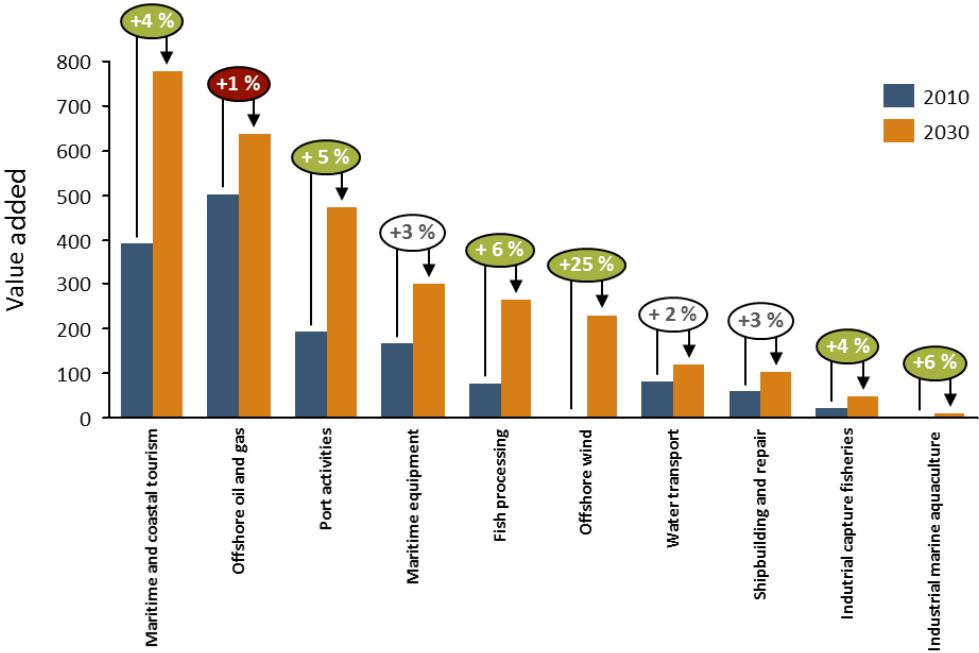
5 to 20 new-builds yearly. Quality is key in the production process, and the fact that Norwegian yards can build vessels indoor is an advantage here. In addition, the competition is less fierce in this segment. Competition comes mainly from smaller yards in Northern Europe (including Germany and the Netherlands), since the larger yards in Europe with bigger facilities tend to focus on the larger cruise vessels. Vard could also potentially benefit from transferring knowledge, sales experience and supplier relationships from its owner Fincantieri. This seems to be a niche where the cluster’s experience in building advanced quality vessels could be leveraged.

When it comes to ferries, Norwegian yards currently have the advantage of developing new environmentally friendly solutions to Norwegian ferry companies. The newbuilding market is currently quite active as newbuilding activity is needed to fulfill new environmental requirements by the Norwegian government. The development of alternative fuel solutions (electric, hybrid, LNG and Hybrid) and accompanying propulsion systems could potentially create a new export niche for Norwegian builders.

**3.6. The long-term outlook for the industry is promising**

While the short-term market developments are weak, the long-term outlook is much more promising. The economic activity in the ocean is expanding quite rapidly, driven by developments in global population, economic growth, trade, rising income levels and technological progress. According to the OECD’s recent report “The Ocean Economy in 2030”, ocean-based industries have the potential to outperform the growth of the global economy as a whole. The OECD expects a particularly strong growth in marine aquaculture and offshore wind, but also a strong growth in maritime tourist activities, port activities, shipbuilding and repair and equipment production. Maritime oil and gas activities are expected to grow the slowest with an annual growth rate of 1 percent. However, oil and gas activities are still expected to be the second largest ocean industry in 2030, only overtaken by tourism.

Figure 3-7: Size of different ocean industries in 2010 and in 2030 measured in value added (bn USD). The numbers show the annual growth rate for the period. Source: OECD (2016)

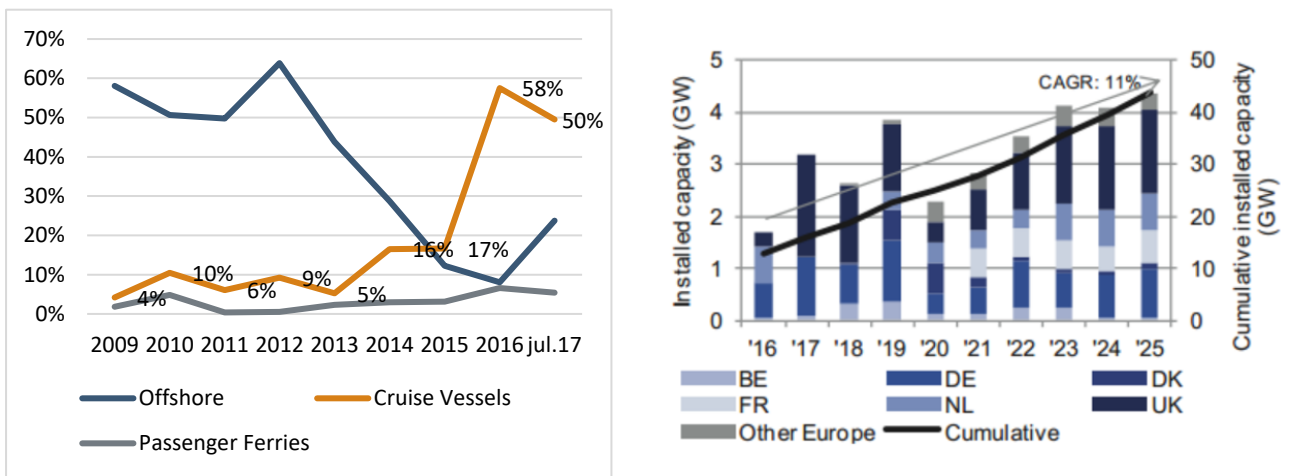


### 3.7. Offshore wind and exploration cruise are two segments with promising growth opportunities

Offshore wind is still a small market compared to offshore oil and gas, but the market is growing quickly and many actors in the Norwegian maritime cluster are now increasingly paying attention to this market. Uptime in Ålesund is one example, delivering gangways that can be used in the offshore wind industry, while Ulstein has already delivered two vessels to this segment. The offshore wind industry is growing quickly, and with an expected growth of 10-20 percent over the next years it should become an interesting market for companies in the Møre cluster.

Figure 3-8: Left: Share of global investments in specialized vessels. Source: Clarkson (2017) (left).

Forecast for installed capacity in offshore wind in Europe (right). Compound annual growth rates (CAGR). Source: BVG Associates.



Another interesting market is the cruise industry, especially the expedition cruise segment. Investment in the cruise industry has been record high the last three years, and with long-term growth in the tourism industry, it is likely that this market will grow further. Kleven and Vard already have a growing part of their order book within this segment. Ulstein Design & Solutions AS was recently awarded a very important contract by China Merchants Group (CMG). The contract includes the design and equipment package for one and options for an additional nine vessels.

Figure 3-9: To the left: Hapag-Lloyds' cruise expedition vessels that will be built at Vard. To the right: Hurtigruten's new cruise ships built at Kleven



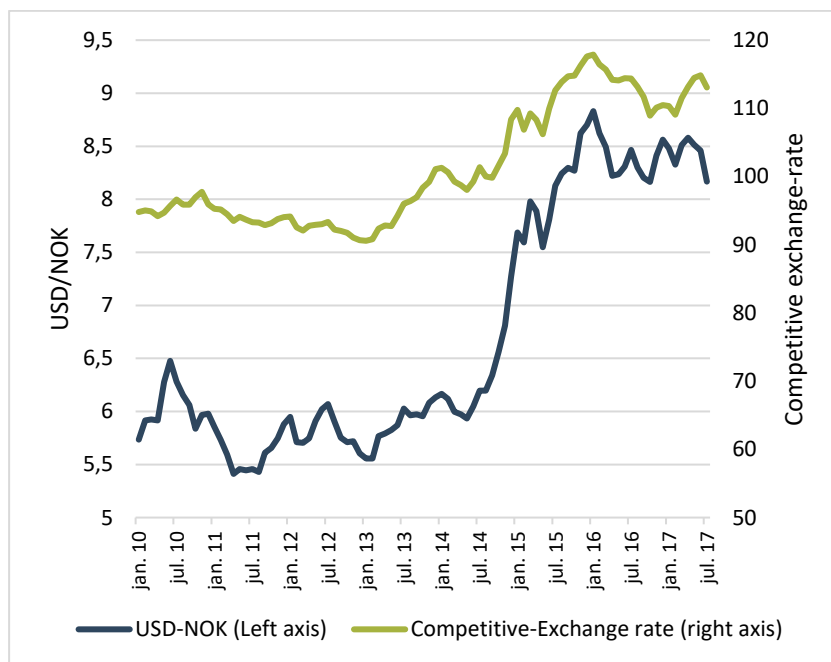
### 3.8. The weakened NOK is still important to keep the cluster competitive

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 – wage cost constituting around a fifth of the turnover. Still, companies also buy input factors from abroad, something that neutralizes 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). These effects are summarized in the table below. The total effect on the cluster is positive, but will vary between companies and segments depending on the share of revenue and costs coming from abroad. 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.

Figure 3-10: Effect of a weakening of the Norwegian krone (NOK) on competitiveness and profitability on company level. Source: Menon (2016)

		revenue	
		USD	NOK
Costs	USD	0	-
	NOK	+	0

Figure 3-11: Exchange rate<sup>3</sup> USD per NOK and the competitive exchange rate January 2010 to August 2017. Source: Norges Bank/Menon (2017)



<sup>3</sup> Konkurranskursindeksen er en nominell effektiv valutakurs beregnet på grunnlag av kursene på NOK mot valutaene for Norges viktigste handelspartnere (geometrisk gjennomsnitt veid med OECDs løpende konkurransevekter). Stigende indeksverdi betyr depresierende kronekurs.

# 4. Cluster competitiveness – national competition

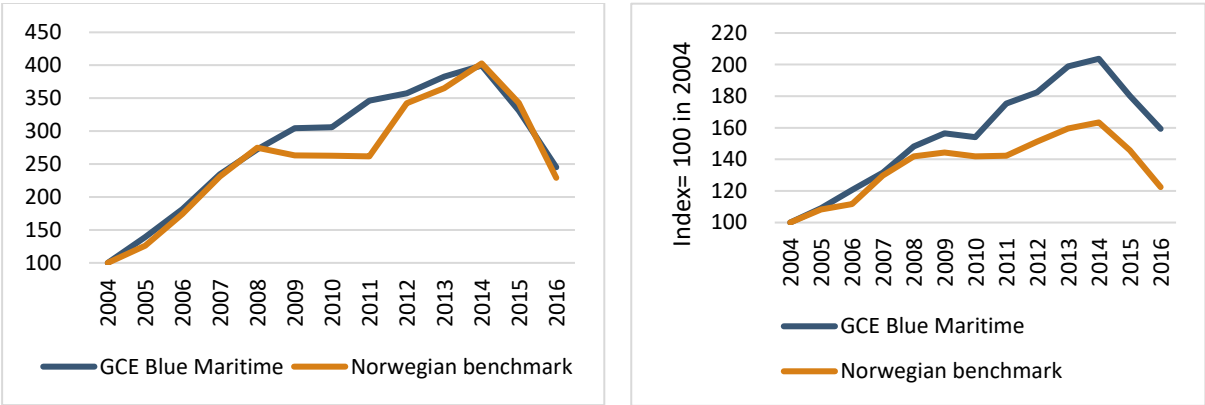
In this chapter, an overall comparison or benchmark between the cluster in Møre and the national benchmark will be presented. Overall, the cluster’s activity level and productivity growth have followed the national industry quite closely. In the period from 2008-2011, the cluster outperformed the Norwegian benchmark, but has since been slightly outperformed by the national benchmark. Looking at profitability, we see that Møre has performed better than the national benchmark before 2009-2011 (depending on which benchmark we look at). Productivity in the cluster peaked in 2009, before falling back. From 2004-2008, the cluster experienced higher profit margins, before the margins converged until 2014. In the two last years, the cluster has underperformed also on this benchmark. At a segment level, yards and services increased their national market share until 2012, while shipping and equipment kept a quite stable market share. Since 2012, all segments have lost market share compared to the national average.

## 4.1. Since 2011, similar Norwegian companies have outperformed the 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 as seen in the graph to the left below. In the following three years, the Møre cluster achieved stronger growth than the Norwegian benchmark.<sup>4</sup> Since 2011, the Norwegian benchmark has caught up and has been growing at a similar pace. Another way to measure changes in activity level is in terms of employment. Looking at this measure, the Møre cluster has experienced faster growth than the national benchmark, particularly in the period 2010-2011. The difference between the two groups has remained quite stable since then.

Figure 4-1: Left: Value added development for GCE Blue Maritime and the Norwegian Benchmark 2004-2016. Indexed development with base in 2004. Weighted based on value added share in the Møre-cluster. Source: Menon (2017).

Right: Indexed employment development for GCE Blue Maritime and the Norwegian Benchmark 2004-2016. Index=100 in 2004.



Another way to benchmark the cluster’s activity is productivity. Below, we find two graphs comparing productivity in the cluster against the Norwegian benchmark. The graph on the left illustrates the value added per employee in the two groups. The graph to the right illustrates the difference in value added between the cluster and the national benchmark. It shows that value added per employee was increasingly higher in Møre

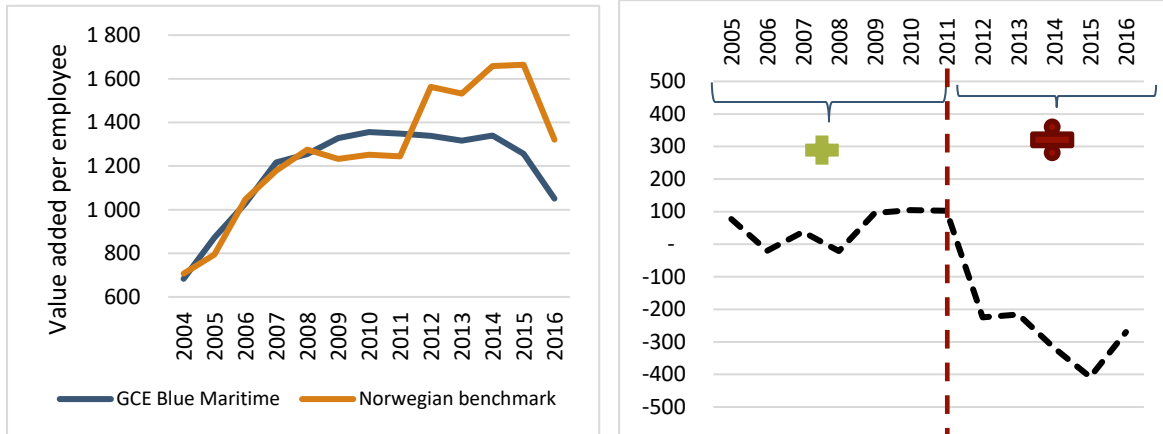
<sup>4</sup> The benchmark consists of maritime companies with similar market focus and activity as the companies in the Møre cluster. The development in the benchmark is weighted so that the composition of different activities in the Norwegian benchmark is the same as in the Møre Cluster.



before 2011, while it has been lower ever since. Productivity in the cluster has fallen since 2009, and has been falling sharply since 2016.

**Figure 4-2: Left: Development in total value added 2004-2016 for GCE Blue Maritime and Norwegian benchmark (Index=100 in 2004). Weighted average based on the cluster’s share of employment. Source: Menon (2016)**

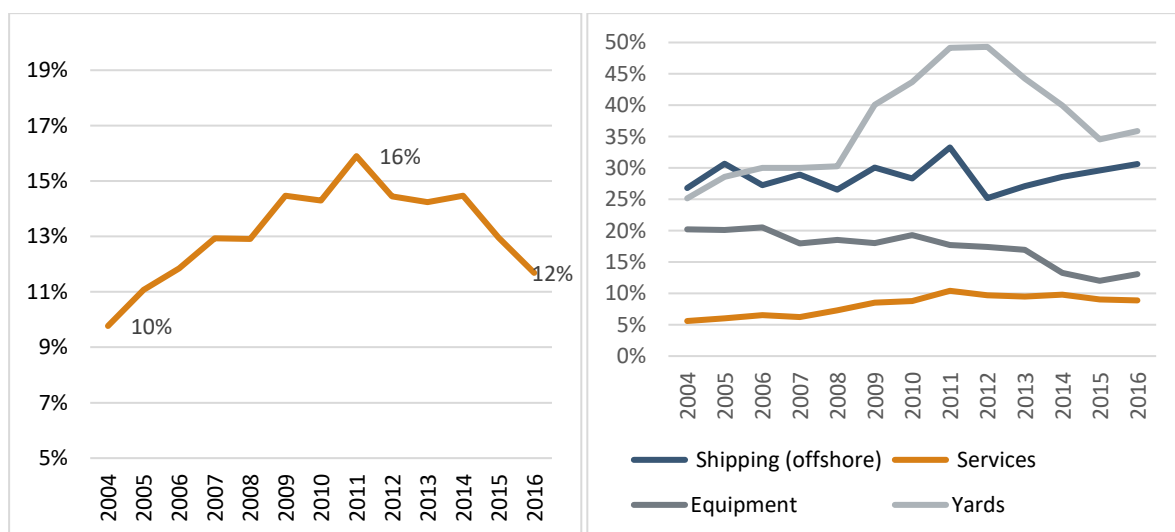
**Right: Difference in productivity level between the Møre cluster and the Norwegian benchmark.**



#### 4.2. Møre’s share of national value creation increased until 2011

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. 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 two latest years. In 2016, 12 percent of the value added in the national industry was generated in the cluster.

**Figure 4-3: Left: Development in total value added 2004-2016 for GCE Blue Maritime and Norwegian benchmark (Index). Source: Menon (2016). Right: The Møre cluster’s share of national value added in different segments (2004-2016). Source: Menon**



Breaking down the development shows that the development at segment level differs. The cluster’s share of the services segment has been growing steadily since 2005, from 6 percent in 2005 to 9 percent in 2016. On the

other hand, the cluster's equipment producers have seen a weaker development than the national industry. They have reduced their share of national value from 20 percent in 2005 to 13 percent in 2016. This fall is mainly attributable to a weaker development in the largest companies in the equipment part of the cluster. It seems like the national maritime equipment industry so far has been able to keep its activity level higher than in the Møre-cluster. Looking at the yards, their share of national value added increased from 30 percent before the financial crisis to 50 percent in the booming offshore years. In the last three years, their value added development has been weaker than in the national industry. Again, we see a clear change in 2011. From that year onwards, the cluster sees a weaker development than the national industry in all segments. The fall is especially pronounced for yards and equipment producers.

## 5. Cluster competitiveness at segment level

In the following subchapters, we will describe the four segments that make up the cluster individually, and look at some of their features. The last two years have seen large changes in ownership both for shipping companies, but also for one of the largest yard groups (Kleven). The shipping cluster is severely weakened by the SolstadFarstad merger, combined with low profitability in the segment.

### 5.1. The shipping companies in Møre have been substantially weakened during the last few years

Shipping companies are still the largest contributor to value added in the cluster in 2016, with 54 percent of the value creation. In 2016, turnover and value added generated by these companies fell sharply. The operating margin was negative for the second consecutive year, falling to -75 percent in 2016. This level is a function of weak earnings, but is mostly influenced by large write-downs in 2016. The table below illustrates the key financials for this part of the cluster in 2015 and 2016.

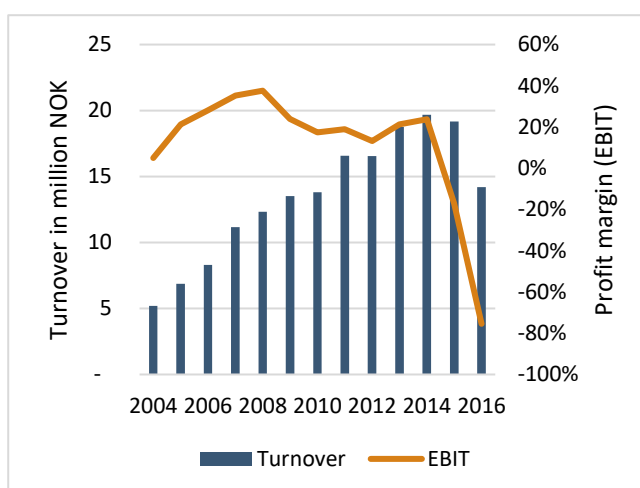
The Møre cluster is still home to one of the largest and most advanced fleets in the world. The Norwegian-owned offshore fleet consisted of around 600 offshore vessels in August 2017. Møre has been and still is a central area for operations and ownership of these vessels. The cluster is home to 17 offshore shipping companies that either operate or own around a third of the Norwegian-fleet (196 vessels<sup>5</sup>). Around 100 vessels are still owned from Møre, while the remaining vessels are operated through shipping companies in the area.

Since last year's report, this OSV-segment has consolidated and Møre's position has been weakened especially by the fact that the largest owner and operator in the cluster (Farstad), has merged with Solstad, Rem (another cluster company) and Deep Sea Supply. Together, the new company created the fourth largest OSV-owner in the world: SolstadFarstad. In last year's report 219

vessels were reported as owned by or controlled from the cluster; of these, 73 vessels exited the ownership through Farstad and Rem merging with Solstad. In addition, 22 vessels have been sold out of the cluster, are not under management of a cluster company or have been scrapped.

Looking at the remaining offshore shipping companies in the cluster, we see that the company size is small compared to the largest international players. SolstadFarstad's combined fleet is for instance larger than all the

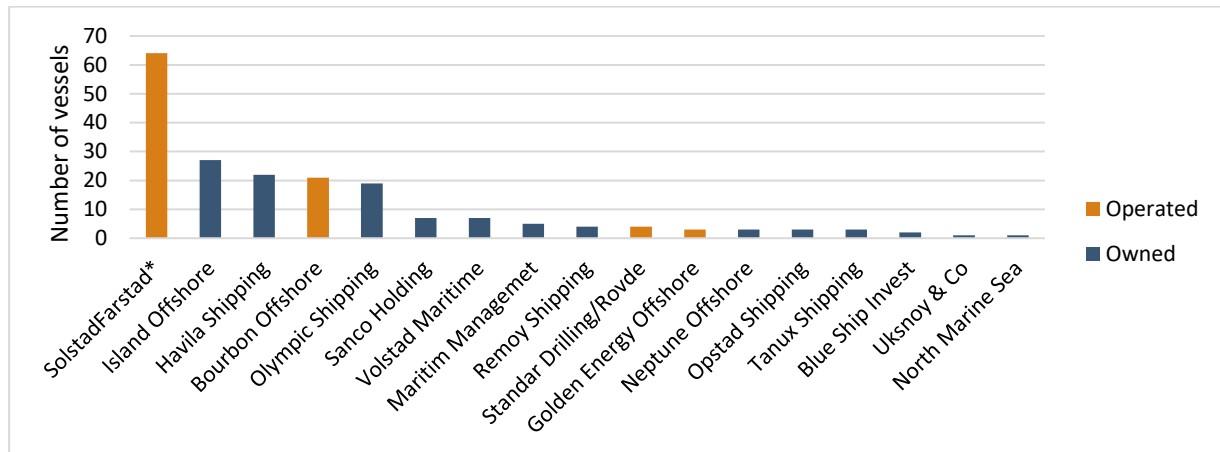
Shipping	2015	2016	Change (bn NOK)	Change (in percent)
<b>Turnover</b>	19.2	14.2	-5.0	-26 %
<b>Value added</b>	13.4	8.8	-4.6	-34 %
<b>Net Operating Margin</b>	-17 %	-75 %	-58 %	
<b>Employment</b>	5 151	4 213	-938	-18 %



<sup>5</sup> This includes 56 vessels from the SolstadFarstad fleet that are believed to be operated from Møre.

14 shipping companies in the cluster. The 10 largest operators in the world control less than 20 percent of the world's fleet. The total fleet of almost 10 000 OSVs has more than 2000 registered owners. This means that the industry is still fragmented despite the consolidation efforts during the last two or three years. The Møre region is still an important area for owners and operators in Norway, but has been surpassed by other areas in Norway.

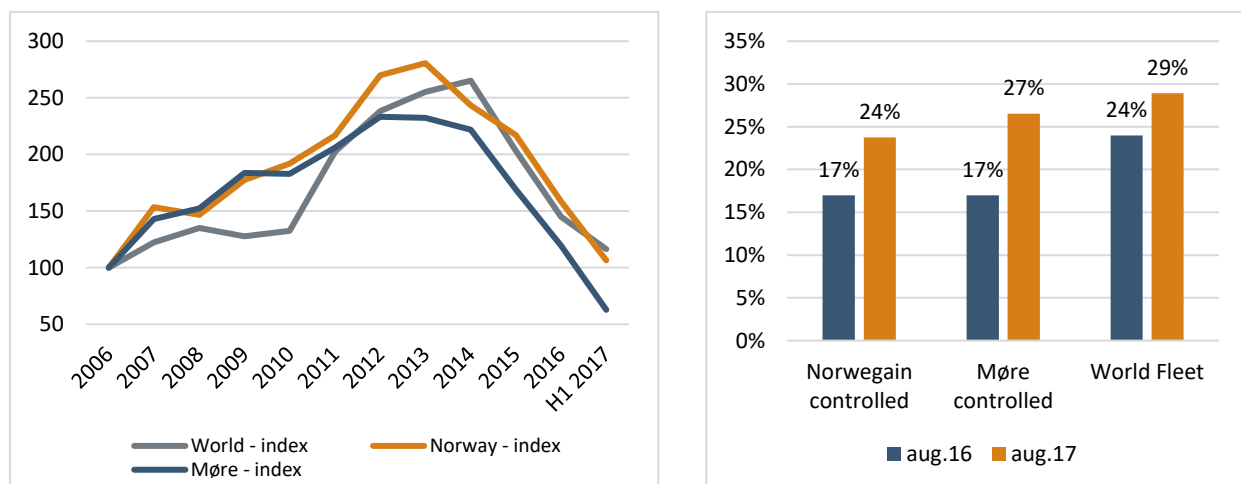
Figure 5-1: Offshore fleet - operated or owned from the cluster. August 2017. Source; Menon/Clarkson (2017)



The offshore companies operate in a global market, and as described in the chapter on market developments, all offshore shipping companies are hit hard. The graph below shows that there are relatively small differences when it comes to the share of fleet that is laid up among the three groups of owners/operators. Of the total world fleet, 29 percent is laid up, compared to 27 percent of the Møre-fleet and 24 percent of the remaining Norwegian fleet (Clarkson-data).

The graph below illustrate the development of activity for three groups of shipping companies; Møre (the cluster), Norway and internationally (world). It illustrates a familiar trend: the shipping companies grow somewhat faster than competitors in Norway and internationally up to 2011, before growth slows down. Since then, the shipping companies in the cluster have grown more slowly than competitors in Norway and internationally. The development in the first half of 2017 suggests that the shipping companies in the cluster will lose substantial market shares in 2017.

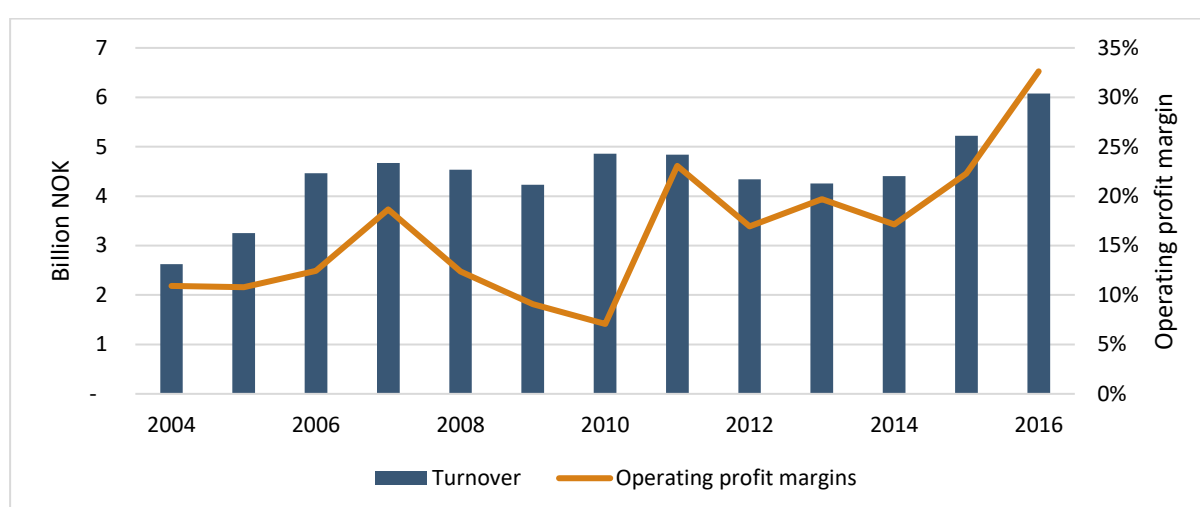
Figure 5-2: Left: Indexed development in revenue for key offshore shipping companies in Møre, Norway and the world. Source: Menon (2017). Right: Share of fleet laid up for three groups of owners/operators in August 2016 & 2017. Source: Clarkson (2017)



### 5.1.1. Shipping companies focusing on fisheries are experiencing high growth and increasing profitability

Fishing has been an important activity in the region since people moved to Møre. In recent years, the industry has experienced activity growth and higher profitability. In the last two years, turnover has increased by almost 40 percent. This can partly be explained by price developments in the end market (prices for seafood in general have increased). We do not include these activities in the overall cluster development. The reason for this is mostly technical; it is difficult to split the operational fishing activities from maritime operations (owning and operating the vessels) in the financial numbers. However, fishing activities and aquaculture are becoming more important for the cluster, and it is positive for the cluster that a large part of these activities happen in Møre & Romsdal.

Figure 5-1: Turnover and profitability for shipping companies with fishery activities located in the cluster. Source: Menon (2017)



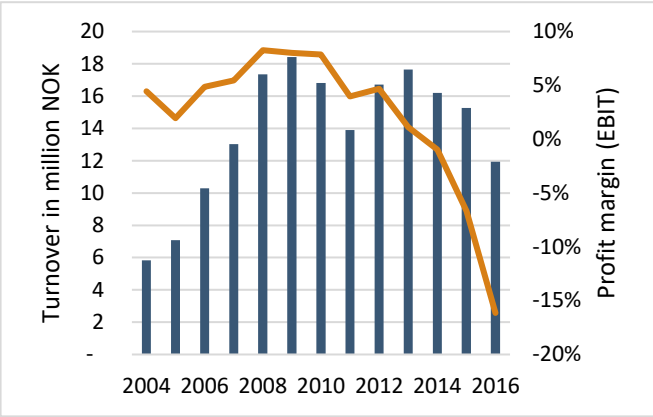
### 5.2. Equipment manufacturers deliver very weak results in 2016, but SMEs are still delivering positive margins

The equipment producers have seen another year with lower activity in 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. It is also seen in a strong cost-focus in this segment. 2016 marked a new record when it comes to weak economic results, with net operating margins falling to minus 16 percent. The companies are also losing market shares in Norway and internationally. 2017 is expected to be another weak year, but it is also the year when Rolls-Royce Marine decided to set aside NOK 2 billion to further developments in its maritime area. Some part of these investments will end up in the Møre-region to support the development of a global fleet management center in Ålesund. Rolls-Royce is a pioneer in developing digital competence in

	2015	2016	Change (bn NOK)	Change (in percent)
<b>Equipment</b>				
<b>Turnover</b>	15,3	11,9	-3,3	-22 %
<b>Value added</b>	3,5	2,5	-1,0	-28 %
<b>Net Operating Margin</b>	-7 %	-16 %	-9 %	
<b>Employment</b>	4 823	4 255	-568	-12 %

the cluster and will be an important driver for the future developments for the equipment segment and the cluster at large.

The Møre cluster is home to some of the world’s leading equipment manufacturers with Rolls-Royce Marine in the forefront. Since the financial crisis, activity and profitability have fallen sharply. Still, many of the companies are the leading manufacturers in their area. Currently the companies in this segment are along with the



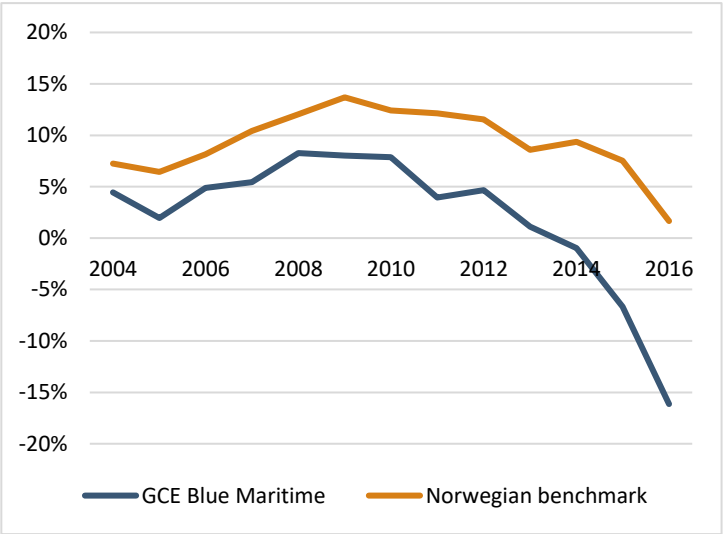
cluster trying to adapt to the new market situation. The offshore segment is still important. At present, the new-building market is very weak, but since many of these companies generate large parts of their profit from the after-market, the offshore market will still be important for them going forward.

Through several acquisitions, Rolls-Royce Marine has grown into the largest equipment manufacturer in the cluster, accounting for more than half of the revenue within the segment. Developments within the segment will consequently be dominated by this one player. Brunvoll, Inmarsat Solutions and Sperre are the second, third and fourth largest players.

The weak overall results 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 2015 and 2016, illustrating that many of these companies have been able to stay profitable.

Going forward, we would expect consolidation also in this part of the cluster. Many companies have specialized within smaller niches, and with lower overall demand a good strategy could be to consolidate to take advantage of economies of scale. In general, the focus must be on both developing new products and cutting costs through more efficient production processes. A challenge for this part of the cluster is to develop in a situation where low-profitability challenges the ability to invest in product and process innovation.

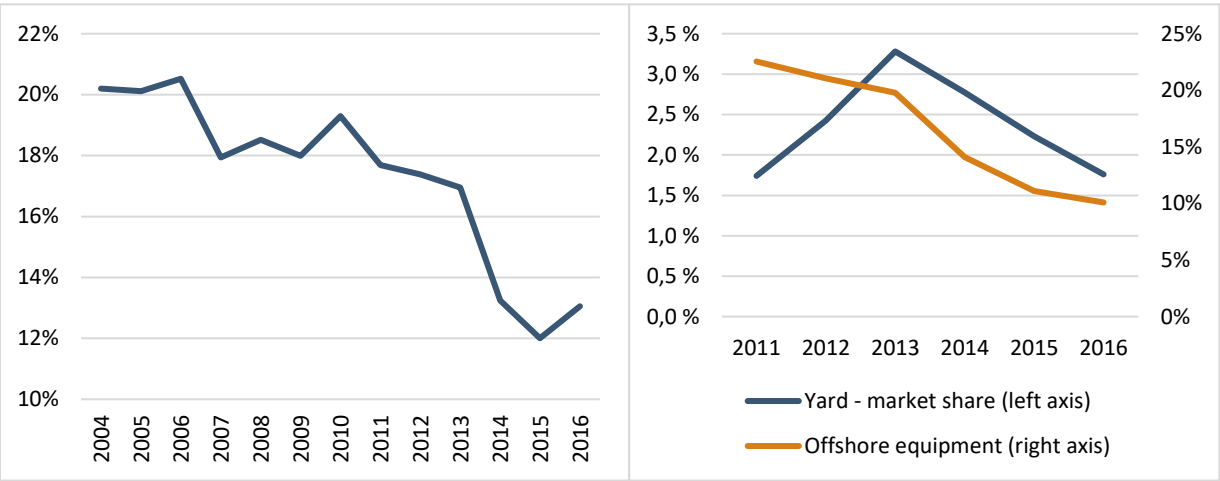
**Figure 5-2: Profitability for equipment producers in the cluster compared with the Norwegian benchmark**



It is difficult to develop national and international benchmarks for the activity level for equipment producers. This is mainly because these companies serve at have a wide range of markets. Profitability is an interesting benchmark since it captures the effect of the strategic choices of market offerings. The graph to the right shows how the equipment manufacturers in Møre have experienced a general lower profitability compared to the Norwegian benchmark. The difference in performance has increased since 2011, and in 2016 it was 18 percentage points.

It is difficult to benchmark equipment manufacturers. This is due to the fact that the cluster produces a wide variety of equipment from fish handling gear to advanced sensors. The other reason is that many of the largest companies internationally are conglomerates, making it difficult to extract information for maritime activities alone. In the graph on the right, turnover for the equipment producers is converted to market shares in two markets: the global yard market (blue line) and as a share of maritime offshore equipment (right axis). None of these gives a perfect benchmark for market shares, but it gives an indication on the development. We see that since 2013, both the international benchmarks indicate a reduced market share of the equipment manufacturers in Møre. This is probably due to the fact that the equipment manufacturers are so focused on the offshore market, while other equipment manufacturers sell a larger share of their equipment to other market applications.

**Figure 5-3: Left: The cluster’s share of Norwegian equipment manufactures value added (2004-2015). To the right: Equipment producers in GCE Blue Maritime’s share of global deliveries at yards and share of marine offshore equipment market. Source: Menon/Rystad/Clarkson**



### 5.3. The service segment is key for the innovative power in the cluster

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.

Activity level and profitability in this segment have also fallen during the last years. Still, the net operating margin is much stronger than for the cluster as a whole, and the activity level is also less affected than in the overall cluster.

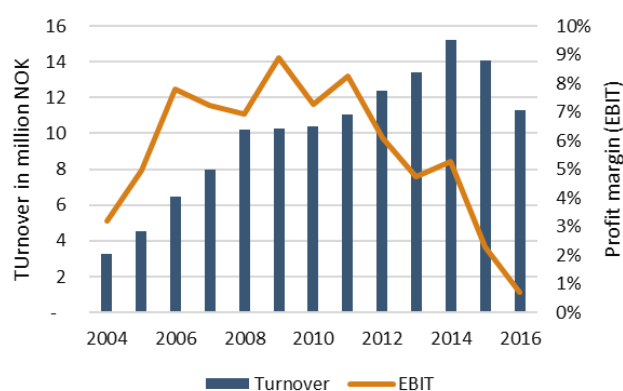
Design, considered a part of the segment, has an especially important role in product innovation. Design, as a sub-segment, has the highest net operating margin in the cluster of 11 percent in 2016 – but is still down significantly from the previous year.

Both the key financials and the figures below show that the service segment is struggling. All key financials are negative. 2015 and 2016 was the first time this segment saw a significant drop in turnover this decade.

Key financials for the service segment (2015-2016)

Services	2015	2016	Change (bn NOK)	Change (in percent)
<b>Turnover</b>	19,2	14,2	-5,0	-26 %
<b>Value added</b>	3,2	2,7	-0,5	-16 %
<b>Net Operating Margin</b>	2,3 %	0,7 %	-2 %	
<b>Employment</b>	3 689	3 313	-377	-10 %

Turnover and profitability (EBIT-margin) 2004-2016.



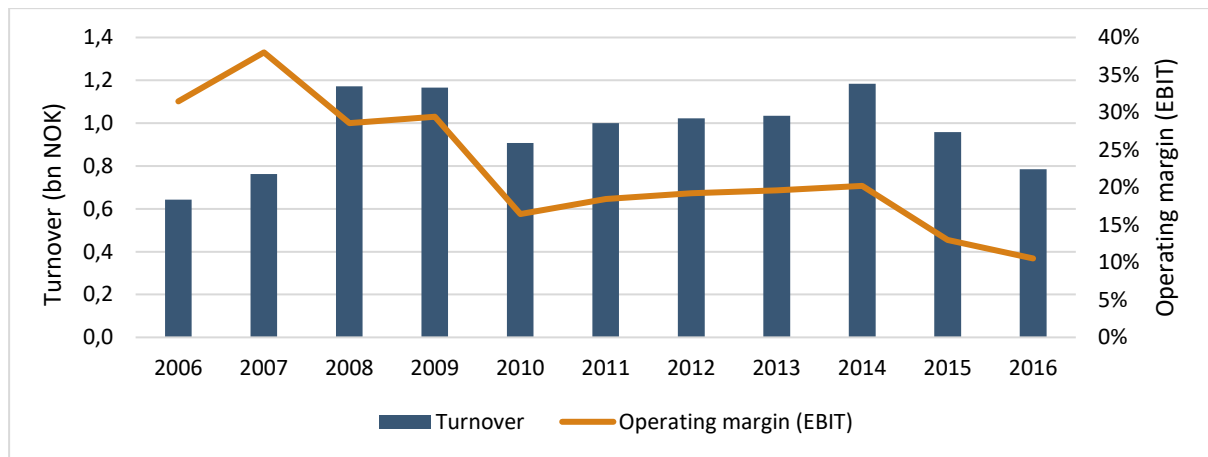
#### 5.3.1. The design companies play an important role for the cluster's innovative power

Design and engineering companies are a major driver for innovation and product development in the cluster and a key component of the value proposition from the Møre shipyards to their customers. They play a crucial role when design services are sold to ship owners, since these services are based on services from Møre yards and equipment packages from local equipment producers. In other words, these companies work as a "sales force" for both local shipyards and equipment and service suppliers. In last year's report, some of the surveyed shipyards argued that without in-house design, significantly fewer ships would be built in Norway.

The design companies have traditionally seen very high profitability, but in the last years this has fallen drastically. This is mainly because of changing market focus and the disappearance of new-builds within the offshore-segment. Without the demand from aquaculture/fisheries and other growing segments, independent designers would have been in enormous financial problems. Still, this is the segment with the highest profitability in the cluster, and designers play a vital role in shaping the cluster's future competitiveness. Because of both the important knowledge spillovers from these companies and the high profitability in this segment, international competition might increase. Hyundai Heavy Industries, one of the world's largest shipyards, decided to establish its own offshore ship design subsidiary that started working from 2014.



Figure 5-4: Turnover and operating margin (EBIT) for design activities. Source: Menon (2017)



### 5.4. The yards are still struggling, but have a good chance of adapting to new market conditions

Møre and Romsdal is the most important area in Norway for shipbuilding activities. As explained in the chapter on market developments, the yards have been challenged by rapidly changing market demand. During the last years, the yards have moved from focusing on offshore vessels towards the growing market for fisheries/aquaculture and exploration cruise, ferries and yachts. The four large yard groups have lost a total of NOK 2,7 billion the last two years and are therefore in a difficult financial situation.

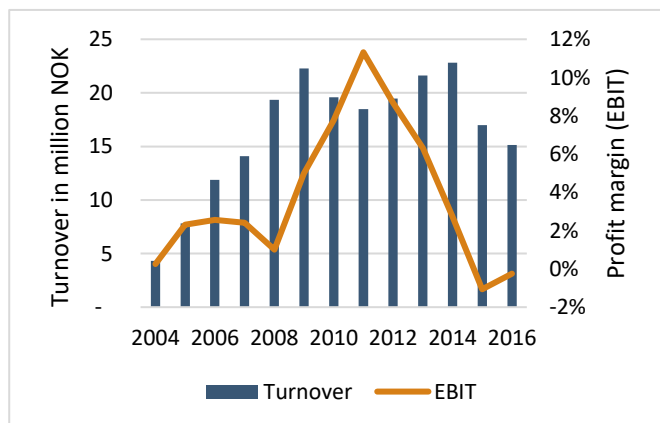
Key financials in 2015 and 2016. Source: Menon (2017)

	Yards	2015	2016	Change (bn NOK)	Change (in percent)
<b>Turnover</b>		22,8	17,0	-5,8	-26 %
<b>Value added</b>		2,2	2,2	-0,0	-1 %
<b>Net Operating Margin</b>		-1,1 %	-0,3 %	1 %	
<b>Employment</b>		3 030	3 148	118	4 %

Results for the first half of 2017 give a first indication on how successful the transition to new markets has been. Both Havyard and Vard deliver negative results, but these are marginal and at least for Vard's part a clear improvement from 2015/16. This together with a slightly growing orderbook through 2017 might be a first indication that the yards will again deliver positive results going forward.

Vard, Kleven, Ulstein and Havyard are the four main yard groups in the cluster, but 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. In the last three years, they have experienced growing activity and profitability. The larger yard groups on the other hand are still struggling. Kleven has been struggling with negative results for the last two years. It experienced problems when a customer for a large offshore ship was not able to make final payments. In the end, Kleven had to sell it losing more than NOK 250 million on this vessel alone. Another problem is that the yards have had

Development in turnover and profitability for the segment 2004-2016. Source: Menon (2017)



to make write-downs on vessels they built and were part-owners of. Lastly, the building of a series of AHTS for Maersk has probably been less profitable than expected when the contract was entered into 2014. In September 2017, Kleven announced that new owners will take control over the yard and increase the capital base by NOK 300 million. The yard will be controlled by TDR and Petter Stordalen (owners of Hurtigruten and currently important customers), which will take a 40 percent stake in the yard group. Existing owners also contribute together with local investors. An interesting development is that the Lürssen-Group also will join on the owner side. The Lürssen-Group is a world-leading designer and yacht builder, and earlier this year it signed a long-term agreement with Kleven. This could give Kleven and the cluster access to valuable competence and supplier relationships.

Ulstein and Havyard have also struggled during the two last years. The Ulstein Group has lost NOK 700 million during the last two years, while Havyard has lost 150 million. Vard is also in a difficult situation. The yard group has lost close to NOK 1.5 billion the last two years, but currently has a strong diversified portfolio. Vard is also a company that could take advantage of its foreign ownership. Fincantieri has long experience building cruise vessels. Vard has also increased its focus on the equipment side in the last few years. It bought Seaonics in 2015 and Storvik Aqua in 2016, increasing its focus on the equipment side. We also see that Hayyard is increasingly integrating vertically by buying up MMC (fish handling equipment) in 2012 and NES in 2015. This means that all the larger yards (except Kleven) are focusing on controlling larger parts of the value chain.

**5.5. Market share increased both nationally and internationally until 2013, but has since fallen**

The graphs below compare the activity level and profitability for cluster yards to national yards. In the period 2008-2012, we see that the Møre yards outperformed other yards in Norway. Value added in the Møre yards increased faster than the national average in these years, resulting in a higher share of the national yard output from 30 to 50 percent. In the following years, this share fell somewhat, down to around 35 percent in 2016. We see a similar development in profitability. In 2008-2013, the Møre yards delivered a higher profitability compared to the national average. In the three latest years, the Møre yards have seen lower profitability than the national industry. We see the same pattern repeat itself, when we look at an international benchmark. Yards increase their share of both the European and the world market until 2013, before falling back.

Figure 5-5: Left: The cluster’s share of total value added in Norwegian Yards 2004-2016. Source: Menon (2017).

Right: Output from Norwegian yards as share of the European and the world market. Source: Clarkson (2017)

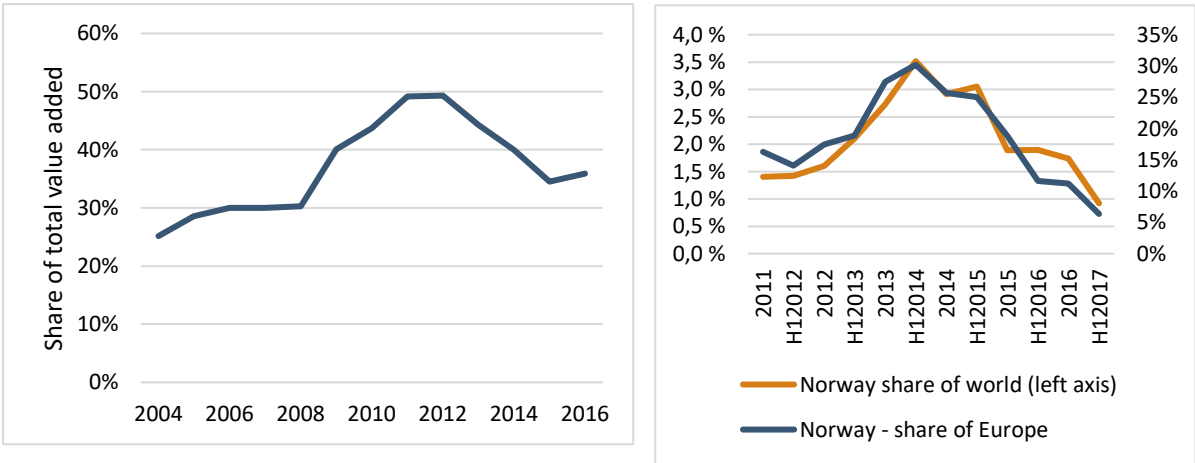


Figure 5-6: Net operating profits for cluster yards versus national benchmark. Source: Menon(2017)

