



Potential for sustainable blue economies

1.1.1 Report on the current status of blue economy business sectors and development trends of key sectors

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ABSTRACT

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Abstract:

The aims of blue economy and the Blue Growth Agenda, in line with the Baltic Sea Region (EUBSR) strategy, are major driving forces in the future Maritime Spatial Planning (MSP) processes. This report outlines the current status of the selected blue economic businesses in the Plan4Blue (P4B) project area in Finland and Estonia and depicts some possible development trends, based on their ten-year past development. This analysis of the blue industry development is primarily based on Orbis Europe database and national statistics databases. The sectoral development is illustrated with graphs presenting turnover and employment figures development and some future trends in the P4B project area in Finland and Estonia separately. All key sectors show positive long-term development, tourism industry showing the strongest future growth potential in terms of expected number of employees. In terms of productivity, the energy sector and marine construction sector are the highest performers out of the selected blue industry sectors in the P4B project area. To better understand the future development and sustainable growth potential of the selected blue industry sectors and coastal regions, more research is suggested to be carried out.

All materials of this Report will be included as part of the forthcoming Deliverable 1.6.1. "*Final report on blue economic potential, sector strategies and development trends*".

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CONTENTS

1. INTRODUCTION	4
Background to the Blue Economy and the Blue Growth Agenda	4
Methods.....	5
Plan4Blue project area	5
2. CURRENT STATUS AND DEVELOPMENT OF KEY SECTORS	7
Marine Fishing and aquaculture.....	8
Maritime Transport sector.....	11
Marine Construction sector.....	14
Maritime Tourism sector	17
Marine Energy sector	20
3. CONCLUDING REMARKS	23
REFERENCES	24

1. INTRODUCTION

Background to the Blue Economy and the Blue Growth Agenda

The concept of Blue Economy is a topical and widely acknowledged issue in maritime economy development. The concept itself has no single definition to date but it can be seen as an umbrella of aims and objectives related to the resources and activities linked to the seas and oceans (Keen et al., 2017). The blue economy development within the EU relies on the notion that the individual sectors of the blue economy are interdependent and, that they rely on common skills and shared infrastructure such as ports and electricity distribution networks (COM, 2012). In Europe, where the sea is a distinctive part of European characteristics with 22 countries with coastlines (Ecorys, 2012, 5), the blue economy is calculated to represent 5,4 million jobs and gross value added of around 500 billion euros per year. The application of the blue economy perspectives in research and development is closely associated with the global quest of long-term sustainable development in balancing the economic benefits with health of the world's oceans and seas (UNEP, 2015; CSIRO, 2015). In order to build understanding over the economic potential of the selected blue industries in the Plan4Blue project region, this report concentrates on analysing the current status of the sectors in terms of number of companies, turnover and employment.

For many nations, the sea and its resources represent a phenomenon influencing the culture, livelihood of the nation and the economy in an all-encompassing way. Trade and exchange of ideas with neighbouring nations is one of the means by which civilizations have advanced and evolved over centuries (Westerdahl, 1994). The term blue economy was popularised by the influential book "The Blue Economy: 10 years – 100 innovations – 100 million jobs" by Gunter Pauli (2010) and many others have since emphasized the importance of harmonizing and coordinating the traditional ocean, coastal and marine economic activities with sustainable economic values and to drive sustainable growth (Smith-Godfrey, 2016; COM, 2017; COM, 2014). Thus in short, Blue Economy can be seen as the "sustainable industrialisation of the oceans to the benefit of all", incorporating the Green Economy origin of the concept, the methods, aims and ideology of an economic activity in a non-traditional operating environment, balancing improvements in equity and wellbeing of both humankind and the environment, and enabling the evaluation of effectiveness of the values and activities in calculable terms (Smith-Godfrey, 2016).

In the Baltic Sea Region (BSR), the multitude of socio-economic linkages between nations, regions and organizational networks have existed and developed over centuries in accordance with political whirlpool and spurts. The significant direct and indirect influences of the sea to the national economies in the EU and at the BSR level have been widely recognised and as a consequence, the European Commission adopted a 'Sustainable Blue Growth Agenda for the Baltic Sea Region' in 2014 (COM, 2014b). The objective of the Commission has been to stimulate inter-regional, multi-sector and inter-cluster cooperation and promote a pipeline of projects for innovation and sustainability. A study, *Towards an Implementation Strategy for the Sustainable Blue Growth Agenda for the Baltic Sea Region* was made available at the BSR Strategy Forum in June 13/14th 2017 in Berlin (COM, 2017). To complement the strategic development of the blue economy in the BSR, member states receive support for cross-sectoral maritime spatial planning (MSP) in the sea basin. Linkages between planning authorities, research institutions and universities - together with participatory approaches to engage wider public and private stakeholder audiences to MSP – is believed to positively influence and support the wider sustainable development of the BSR (COM, 2014a).

In accordance with the earlier presented definition of blue economy, the EU-coined concept of "Blue Growth" is an initiative that means a long-term strategy that supports the growth of the marine economy as a whole. According to the strategy, the seas and oceans are important engines for the European economy and have a significant potential for innovation and growth. Blue growth promotes the Europe 2020 goals for intelligent, sustainable and inclusive growth under the EU Integrated Maritime Policy. The European Commission perceives that growth in the blue economy offers new and innovative ways to help steer the EU out of its economic crisis (COM, 2012). Furthermore, it can contribute to the EU's international competitiveness, resource efficiency (COM, 2011), job creation and new sources of growth whilst safeguarding biodiversity and protecting the marine environment, thus preserving the services that healthy and resilient marine and coastal ecosystems provide (COM, 2012).

Methods

The information provided about the selected blue industries in the Plan4Blue project area in Estonia and Finland is based on the Orbis Europe database and national statistics databases. All the company information and analysis is based on the selected blue industry companies that have at least two employees and an annual turnover of 1000 euros or more during any year between 2007-2016. It should be noted that the business activities of the blue industry companies located in the Plan4Blue project area may partially take place outside the project area and similarly, the activities may either be majorly land and/or sea based. For these reasons the business databases alone do not reveal the significance of individual company activities to the regional MSP processes but the main purpose here is to have a deeper understanding of the wider regional blue economy in the Plan4Blue area as a whole. The gathered data is complemented by information from previous EU blue growth and BSR studies and national industry reports.

Because of data limitations in the Orbis Europe database – time series is only eleven years from 2007 to 2017 – the trend analysis for forecasts have been made only until the year 2030 and in some cases just until 2025. The shorter forecast period means that the time series – depending usually on the variable and industry considered - concerning the past development has been very fluctuating. We have also made some preliminary trend forecasts even until 2050 but they are not reported here.

Plan4Blue project area

Coastal regions (NUTS 3 level) in Finland and Estonia have been the unit of the analysis in the study. The industry data will enable coastal area (LAU 2 level) analysis too, should it be needed in the later stages of the Plan4Blue project. The blue industry data has also been used to place individual companies on the map and to visualise, for example, their size in terms of the annual turnover and the number of employees. The Figure 1 illustrates the geographical Plan4Blue project area.

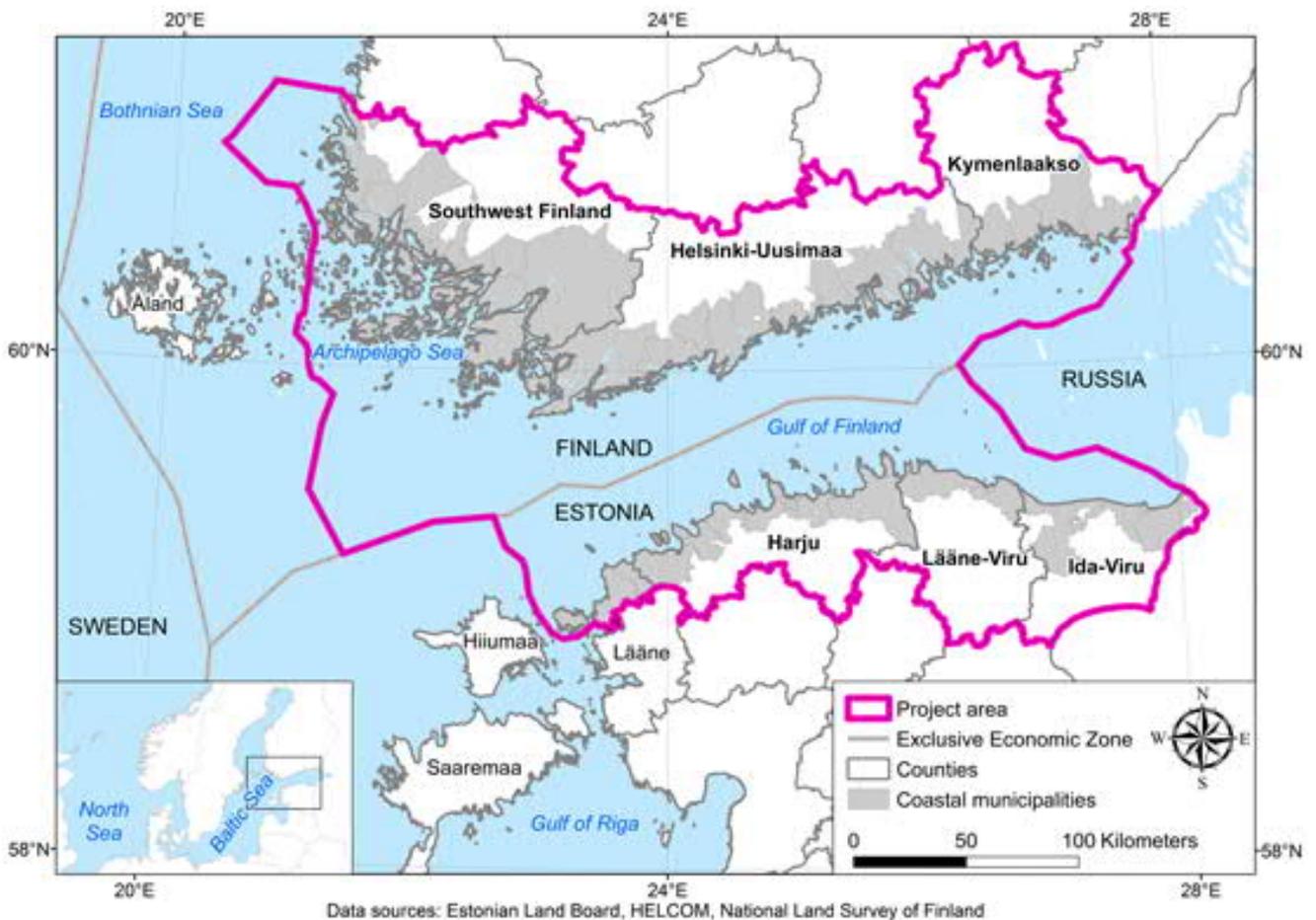


Figure 1. The Plan4Blue project area

The coastal areas amount to a significant proportion of the total regional economy in both countries (COM, 2013). Hence, the impact of the sea to the regional economy may be much more overwhelming than the levels analysed in the blue economy and blue growth studies in the BSR that are based on an analysis of a handful of typical blue (growth) industry sectors. According to Eurostat (2011) the share of the coastal regions in Finland is almost 60 % and in Estonia almost 65 % of the total share of regions. There are also other indicators that show the potential of the coastal regions. The gross value added (GVA) of coastal (NUTS 3) regions in Finland was over 67 % and in Estonia over 82 % of the national GVA in 2010. Additionally, the Gross Domestic Product (GDP) per capita in Finland's coastal regions was 11,3 % higher than the national average GDP per capita. The population live nearby the sea: in Finland almost 64 % and in Estonia 74 % of the people live in coastal regions (COM, 2013). Generally speaking, the employment rate is also higher in the coastal regions. Out of the Plan4Blue coastal regions in both countries the capital city regions have the highest population density.

2. CURRENT STATUS AND DEVELOPMENT OF KEY SECTORS

The selected key industries and business sectors are spread throughout the project area and they constitute a substantial share of the total business activities in the Plan4Blue project region. The Figure 2 shows the location of the selected blue industry companies in the Plan4Blue project area based on the ORBIS Europe database of the beginning of 2017.

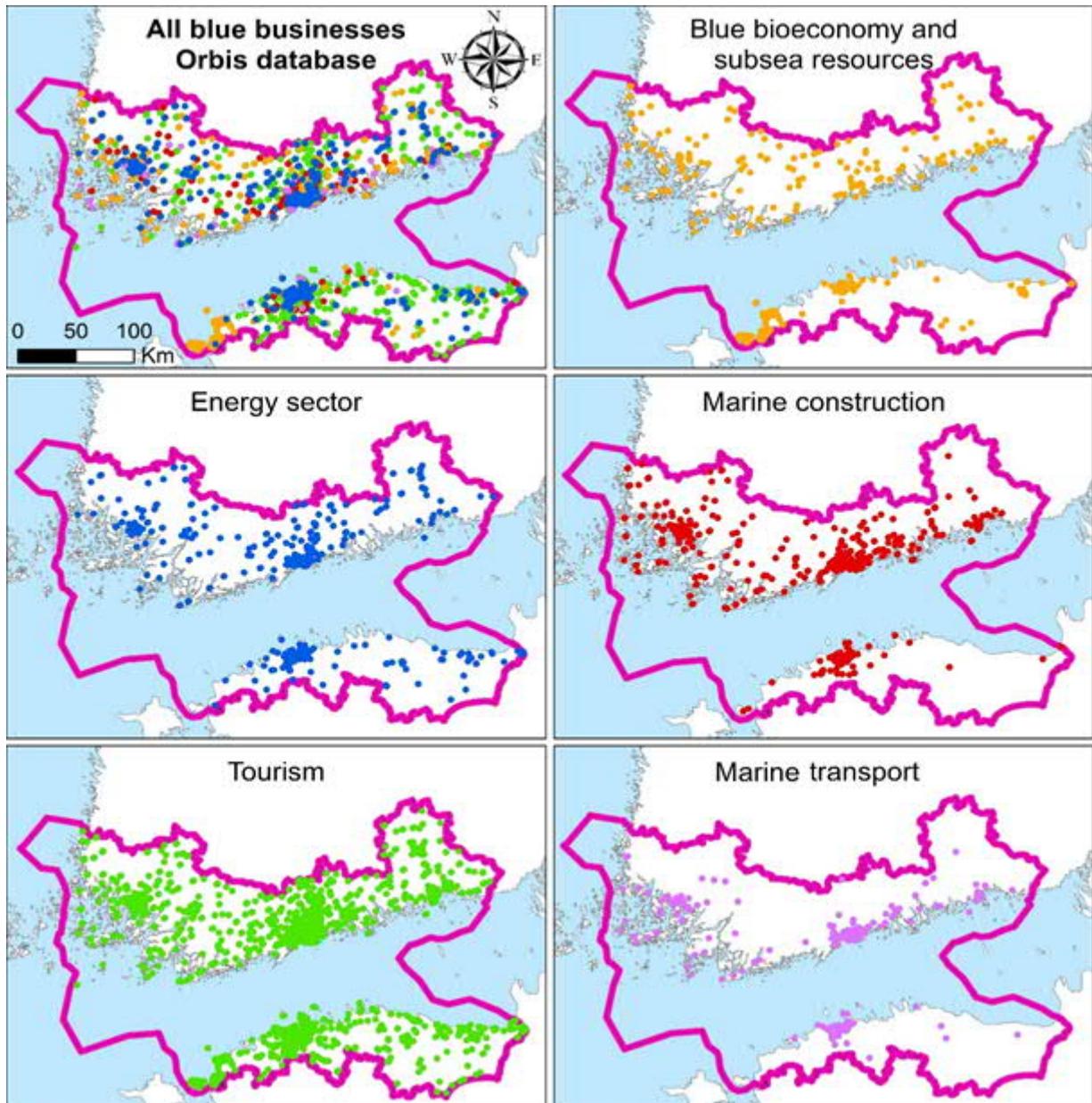


Figure 2. Location of the selected blue industry companies in the Plan4Blue project area based on ORBIS Europe database, 2017

In the following sections, the sectoral development is illustrated with graphs presenting turnover and employment figures development and some future trends in the P4B project area in Finland and Estonia separately. The total turnover identifies the general situation of the sector related companies over the years 2007-2016 and the number of employees gives an overview of how many jobs each sector has created and hence its effects on the whole economy.

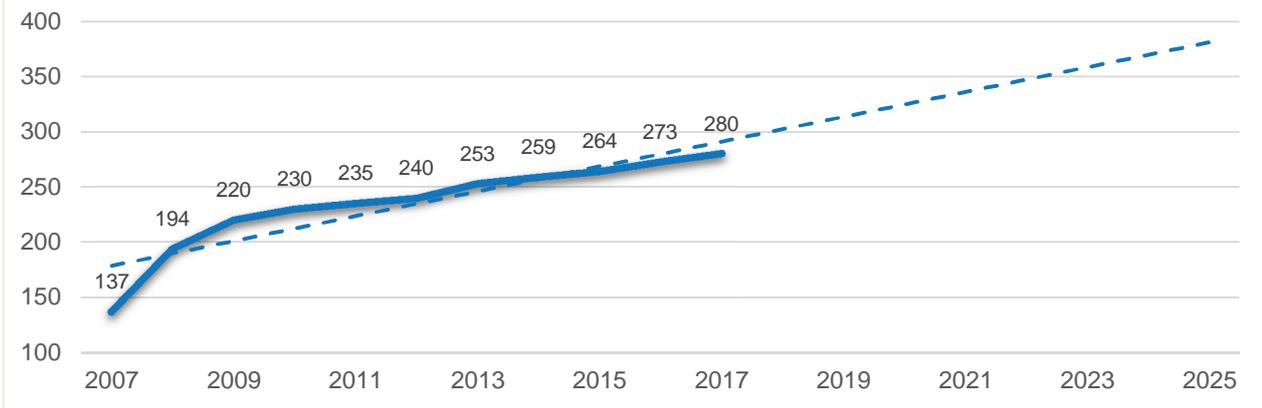
Marine Fishing and aquaculture

According to Luke (2017), the growth of the fish market in Finland is mainly based on imported fish. Half of the fish were domestic in the 1980s; now the share of imports is already over 80 %. Approximately 50 % of the imported fish are from Norway. Salmonids cover more than half of the fish market. Most of the salmonids are imported. Salmonids have been replaced especially by herring, which was the most important trade in the early 1980s. Now it's Norwegian salmon. About 90 % of the catch of professional fisheries in the sea area is Baltic herring, which is about 70 % of the total value of the catch. Herring is thus by far the most important commercial fish species. More than half of the herring and sprat fish are used for fur livestock feed.

The consumption of Baltic herring for human food in Finland has collapsed. Even in the early 1980s, Finns ate more than 30 million kilos of herring. Current consumption is no more than a tenth of it, 3,5-4 million kilos. Pike, whitefish, perch and salmon are also caught by the coastal fisheries. The production of domestic fish farming was at its highest in the early 1990s. Since then, production volumes have dropped from about 19 million kilograms to about 13 million kilograms. Most of the production and value of domestic fish farming is a rainbow trout. Next, the most important species is whitefish. Earlier, mainly goat and herring were exported from Finland. Today, almost half of the value of exports is salmonids. Salmonids are exported to Estonia, Russia, Sweden and Latvia. A significant part of the production returns to the domestic market in Finland as fish fillets and other refinements. Today, almost three times more fish are processed in Finland than in the early 1990s. More than half of the fish used for fish products is domestic. Salmon and rainbow trout make up more than half of the raw material, 40 % of which is herring. Most of the herring is frozen for export (Luke, 2017).

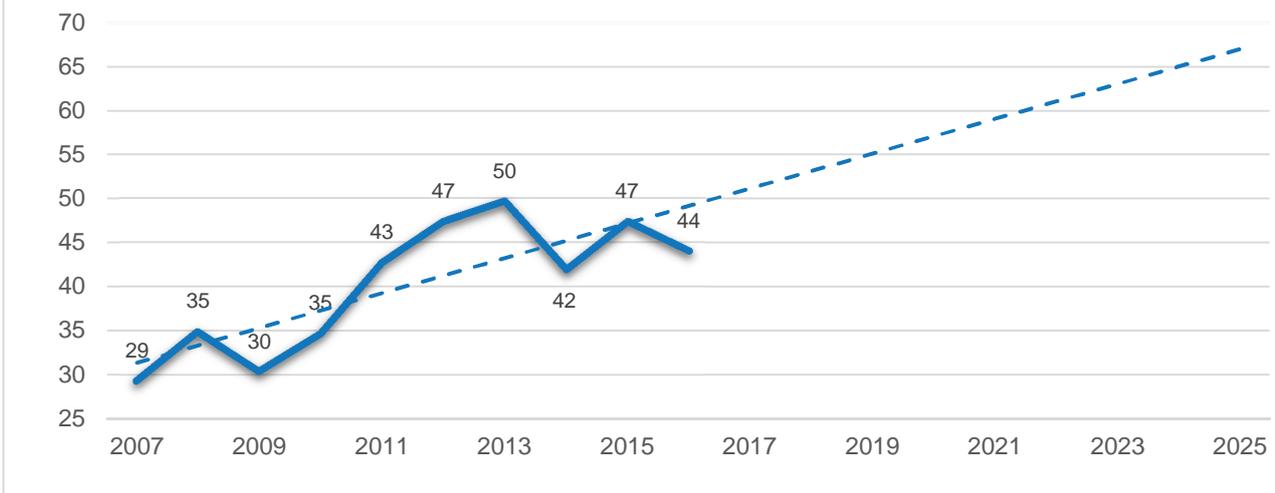
To illustrate the recent Fishing and aquaculture industry developments in the P4B project area, 22 largest and most active Estonian companies were identified in the Orbis Europe database for the analysis. These companies employed two or more people and have an annual turnover of 1000 Euros or more in 2007-2016. The data includes Marine fishing (0311) and Marine aquaculture (0321). Based on the nine-year development in 2007-2016, in the case of linear development, the estimated number of employees in 2030 will grow to 450 in the P4B Estonian area alone, assuming that the linear development trend will actualise. This is illustrated in Graph 1 below. This however is highly unlikely since the predicted volume growth in the Fishing and aquaculture sector is emerging in fish farming and within similar activities that are investing in product development and adopting new technologies to improve productivity. Compared with aquaculture activities, such as fish farming, traditional fishing is more labour-intensive and has less potential for (radical) innovations and hence cannot match the positive profitability development in aquaculture.

Graph 1. Fishing & aquaculture EST Number of employees (N22 companies)



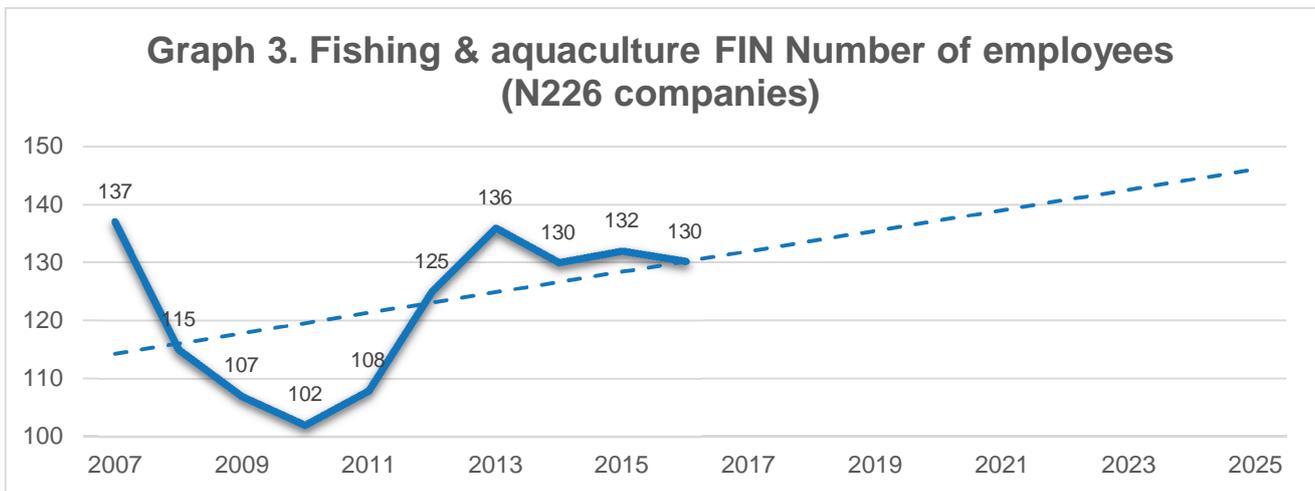
In terms of employment, the commercial fishing sector related to the Baltic Sea waters was estimated to employ in total 2070 people in Estonia and 1847 people in Finland (HELCOM, 2017). The estimated total turnover of the Fishing and aquaculture sector in the P4B Estonian area has practically doubled within the last decade. The Graph 2 below illustrates a strong positive turnover growth rate and its continuing linear trend until 2025. Due to the continuing product development and investments in the industry, the actual turnover in the becoming decades may reach even higher numbers than those predicted by the linear trend. According to the depicted linear development trend in Graph 2, the total turnover of Fishing and aquaculture industry in the P4B Estonian area will reach about 70 million euros by 2030. Previously it has been reported that in the Baltic Sea region the total estimated gross value added (GVA) in commercial fishing was 9,3 million euros in Estonia and 15,5 million euros in Finland (HELCOM, 2017).

Graph 2. Fishing & aquaculture EST Operating revenue (Turnover) MEur (N22 companies)



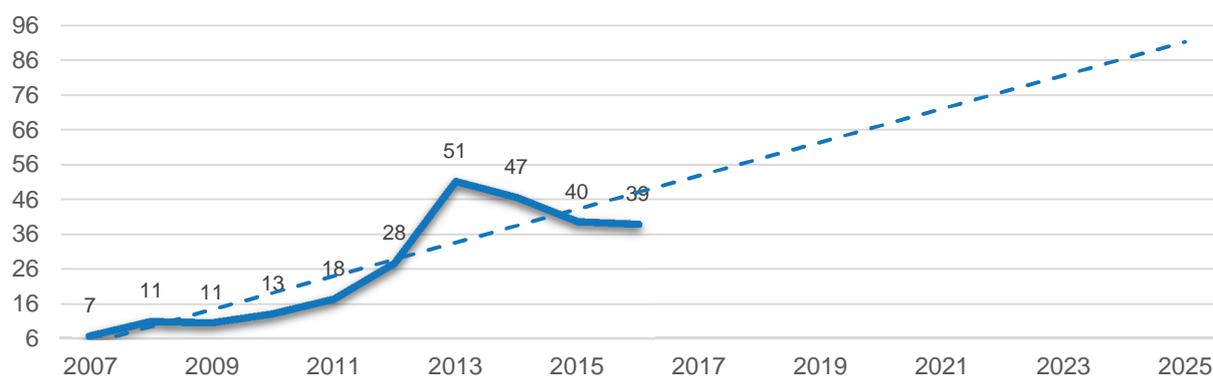
Based on the Orbis Europe database listings, the equal number of Fishing and aquaculture companies in the P4B Finland project area was 226 in total. According to Statistics Finland, the number of aquaculture companies alone in 2015 in the P4B area in Finland was 25. In 2007 the same number was 38 companies. (Kunto, 2017) At the same time, however, the total annual turnover has risen from 13,3 in 2007 to 18,3 million euros in 2015 and labour productivity has risen from 200 to

272 euros per employee. To determine the number of employees in Marine fishing and aquaculture in the P4B project area in Finland (see Graph 3 below), we have utilized the data provided by Statistics Finland in their Kunto database. This was done to avoid some overly conflicting estimations of the past development trends and number of employees in the P4B area with the national statistics. It should be noted here that the official industry employee numbers provided by the Statistics Finland offer somewhat lower-number estimates of employee levels than Orbis Europe database, partially due to the reporting principals and exclusion of data by Statistics Finland to avoid the identification of individual companies in the data. The general trend estimates, however, are comparable. If the future development of employment continued following the linear trend line, by the year 2025 there would be 145 employees in the sector. Based on the national statistics by Luke, the number of fishermen in commercial marine fishing in Finland has decreased by 50 % in 30 years. Despite of this, the total amount of caught fish has doubled since the early 90's and the value of caught fish in commercial marine fishing has doubled in the last ten years on a national level. In recent years the profitability and productivity development in marine fishing in Finland has been strongly positive only with larger fishing vessels.



Major structural changes have taken place in the development of marine fish farming in Finland in the last few decades. Since 1996 the industry has witnessed a 50 % decrease in the number of fish farming units on a national level. The total number of fish farming units in the P4B project area in Finland has dropped from 200 units in year 2000 to 130 units in 2016 according to Luke. Nevertheless, on the national level in Finland the profit levels remain considerably higher in aquaculture (over 60 million euros in 2014) compared to marine fishing (around 40 million Eur in 2014) according to Luke. They estimated the value of the fish farming production in Finland to be 69 million euros in 2016, compared to the value of commercial marine fishing catch that was 39 million euros in 2016. Within the aquaculture sector, fish breeding is a key growth area that has more than doubled its profit levels since 2008. Considering the recent industry developments in turnover and productivity levels, it is likely that the anticipated growth is primarily coming from the aquaculture supported by the investments in new technology and innovations which further improve the efficiency and productivity of the industry.

Graph 4. Fishing & aquaculture FIN Operating revenue (Turnover) MEur (N226 companies)



Reflecting on the linear development trend depicted in Graph 4, the total turnover level in P4B area in Finland will reach over 115 million euros in 2030. Out of the two major type of marine fishing; coastal and open sea fishing; coastal fishermen are reported to earn less than those fishermen engaged with trawling. The income and profitability of trawlers is better, but the sector has also been in the process of shifting the number of vessels to foreign ownership over the last few years (Ammattikalastajaliitto, 2015).

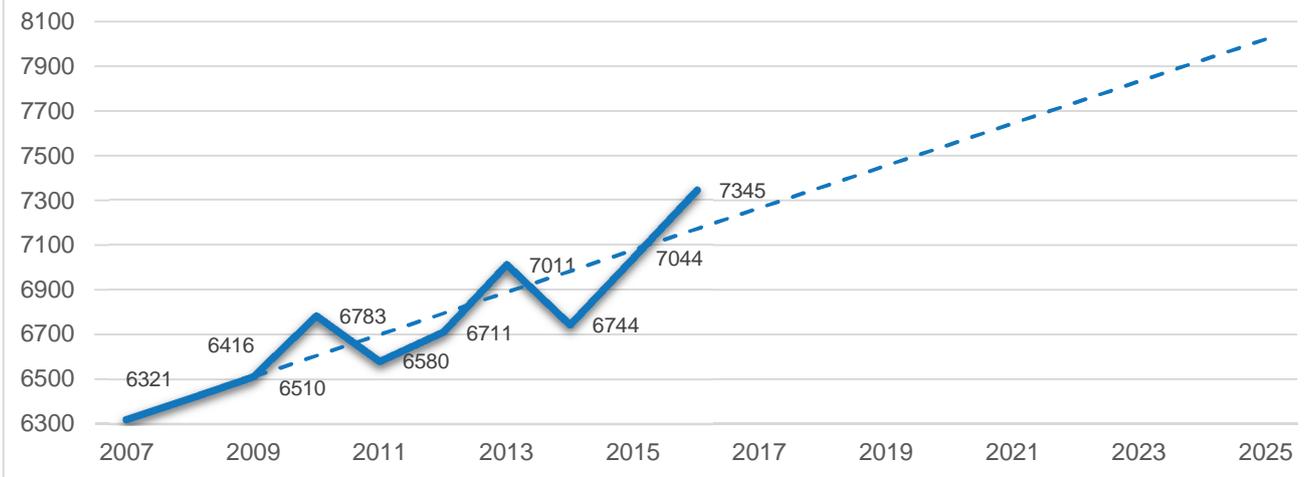
Maritime Transport sector

EU policies are designed to reinforce the efforts of the Member States and regions and provide common building blocks and guidance for the Blue economy. One of those initiatives is “The European Maritime Transport Space without Barriers”, which aims at simplifying administrative procedures for maritime transport and which is considered to be further developed into a 'Blue Belt' of free maritime movement in and around Europe (COM, 2012).

The EU transport policy as stated in the 2011 White Paper on Transport, aims towards a form of mobility that is sustainable, energy-efficient and respectful of the environment. The aim is to reduce the adverse effects of freight transport by using multimodal transport - optimally combining various modes of transport within the same transport chain with a preference to non-road transport for long distance freight transport. Such a modal shift – a reduction of the share of road transport in all transport - towards less polluting and more energy efficient modes of transport can help to reduce the overall environmental impact of freight transport. The target set in the White Paper is to achieve "a modal shift of 30 % of road freight over 300 km by 2030, and more than 50 % by 2050" with respect to business as usual developments (COM, 2016).

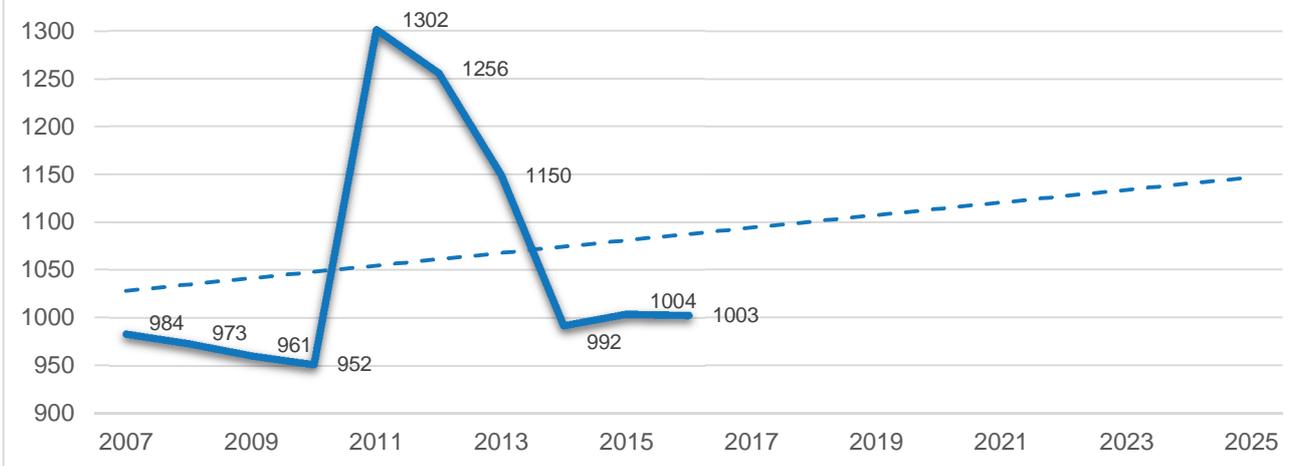
The analysis of the maritime transport sector in Finland and Estonia includes data of the following statistical sectors: Sea and coastal passenger water transport (501), Sea and coastal freight water transport (502), and Renting and leasing of water transport equipment (7734).

Graph 5. Maritime transport - EST - Number of employees (N26 companies)



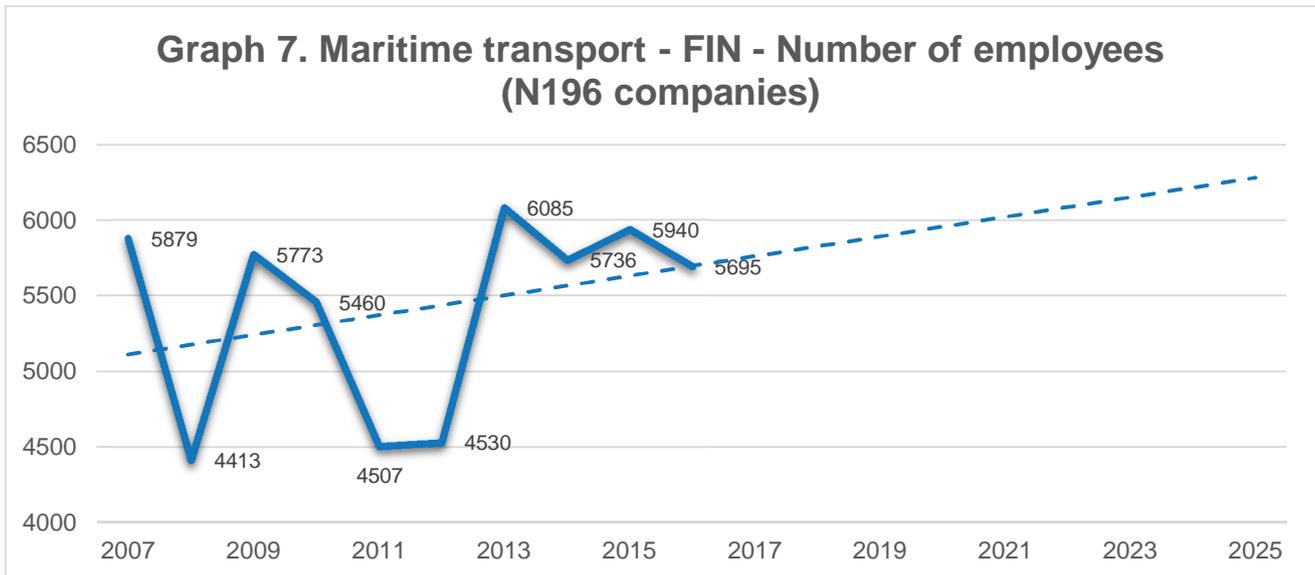
In the studied period, the amount of employees in the Estonian maritime transport sector has risen by 1000 employees in the P4B area shown in Graph 5 above. If the positive trend continues, there should be 8500 employees by 2030.

Graph 6. Maritime transport - EST - Operating revenue (Turnover) MEur (N26 companies)

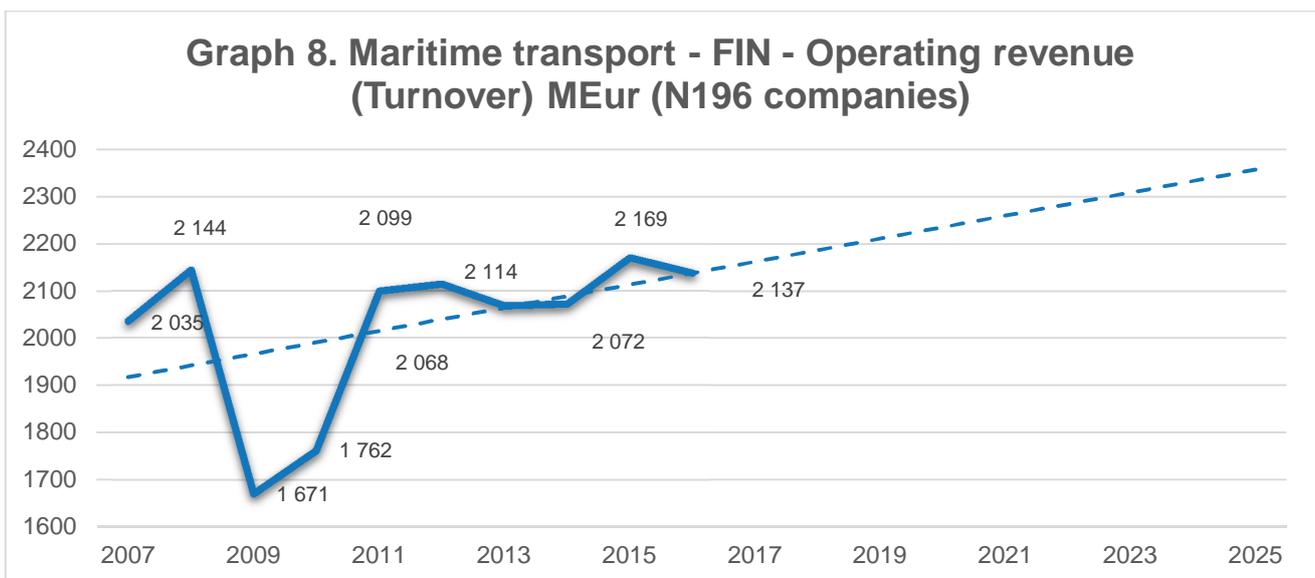


The industry data for the Estonian maritime transport shows major changes in the revenue development during the last ten years. Even if the development has been modest during the last few years, the trend line will point to a realistic average estimation of the future performance of the industry, and the total turnover will reach 1150 million euros by 2025 (see Graph 6 above).

For Finland, the long-term development of the maritime transport shows a positive trend (see the Graph 7 below). According to current development trend by 2025 the industry will employ more than 6300 people.



The turnover of the Maritime sector for Finland also shows a positive trend development, despite of the downturn in 2009. By 2025 the industry will reach a turnover level of more than 2300 million euros (see the Graph 8 below).



Marine Construction sector

The main competitive advantage of the Finnish shipyards lies in a high degree of specialization and innovation; highly specialized vessels requiring a high level of expertise and conceptual development, particularly, in energy saving; excellent project management; short and reliable delivery times; and cost control. The competitiveness of the Finnish marine construction cluster is, however, highly dependent on the vessel type. For standard vessels, competitiveness is on a low level due to the strategic decision of the production of specialized vessels instead of that of standard cargo vessels. This means that the Finnish shipyards have a different cost structure than the large Asian (mainly Korean and Chinese) shipyards which are specialized in serial production of standard vessels and can deliver them to a price that is very hard to compete with (Nommela & Purju, 2016, p. 112).

The Finnish marine construction concerns mainly the Turku and Helsinki shipyards. The Turku shipyard has specialized in cruise vessels and car-passenger ferries that use high-technology solutions, including LNG fuels (Meyer, 2017). Today Meyer Turku has around 1700 employees which makes it a major employer in the South-Western Finland. Besides cruise ships, Finnish shipbuilding is specialized in passenger ferries, icebreakers and warships. Meyer Turku has confirmed orders from Carnival corporation (1,6 billion euros) and from Royal Caribbean cruises (est. 2 billion euros). The Meyer shipyard will produce eight ships in total by 2024 (Yle 10.5.2017) and will increase the number of employees to 2000 (Kaleva 5.5.2017). The Helsinki shipyard specializes in arctic shipbuilding technology, e.g. building icebreakers and other arctic offshore and special vessels. The Helsinki shipyard has constructed 60 % of all icebreakers operational today worldwide.

The competitive edge of Estonian companies lies mainly in building special and more complex ships, using technological updates and providing flexibility in fulfilling orders. However, entering the market with a new product is complicated, because potential buyers need certainty that these products function (Eesti merenduspoliitika 2012–2020, 2011). The offshore segment provides an opportunity for the Estonian shipyards, for example, as subcontractors to Norwegian contractors. There are also opportunities to increase the life-cycle activities of the shipyards as this area has a lot of underused potential. For example, the more stringent environmental regulations provide opportunities for retrofits, conversions etc (Nommela & Purju, 2016).

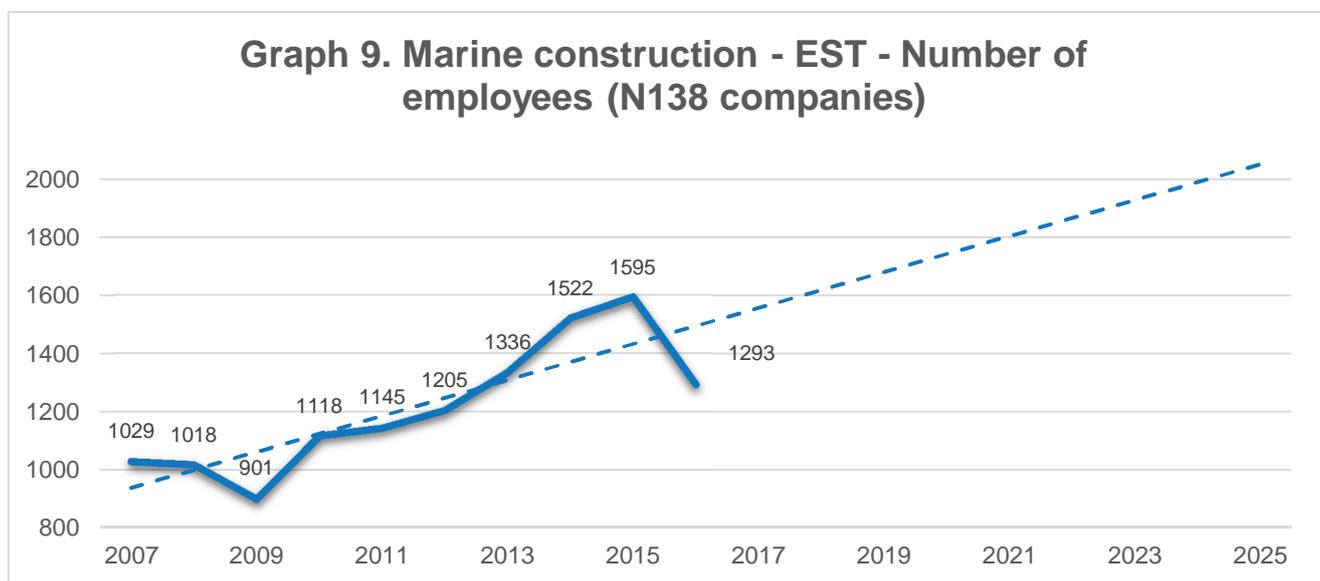
In Estonia, shipbuilding and repair sub-cluster have 22,8 % of turnover and give a job to 33 % of employees in Maritime sector (Estonian Maritime Cluster Outlook 2013). According to the commercial register, altogether 155 companies operated in the field of building ships and floating structures and repair of ships and boats in Estonia in 2010. There are only four large shipbuilding companies that employ most of the employees (Eesti merenduspoliitika 2012–2020, 2011). The companies related to the Maritime sector are mostly concentrated in Tallinn and the surrounding Harju County. In 2012, 65 % of all the studied companies were registered in Harju County. The turnover of the companies registered in the county constituted 95 % of the turnover of the whole maritime cluster and 93 % of the total number of employees in 2012. The biggest field of activity in Harju County was the sub-cluster of maritime service and intermediate commercial transactions that constituted 32 % of the registered companies.

The largest company in Estonia is the Baltic Ship Repair Company (BLRT) located in the P4B project area. The BLRT activities are shipbuilding, ship-repair, production of large-scale metal constructions, metal processing, machine building, medical and technical gases. The company has been producing floating structures for Norway's fisheries and for wind farms located in sea area (offshore wind

farms). BLRT has diversified its production capacities, especially in Estonia and Lithuania, and has managed to keep a competitive quality-cost ratio. The other companies in the sector are small and medium-sized companies and producers of niche products. They use local resources and their labour costs have been competitive. There is a small cluster of producers on the Estonian islands, where costs are lower and local tradition plays an important role in developing this sector (Nommela & Purju, 2016, p. 117).

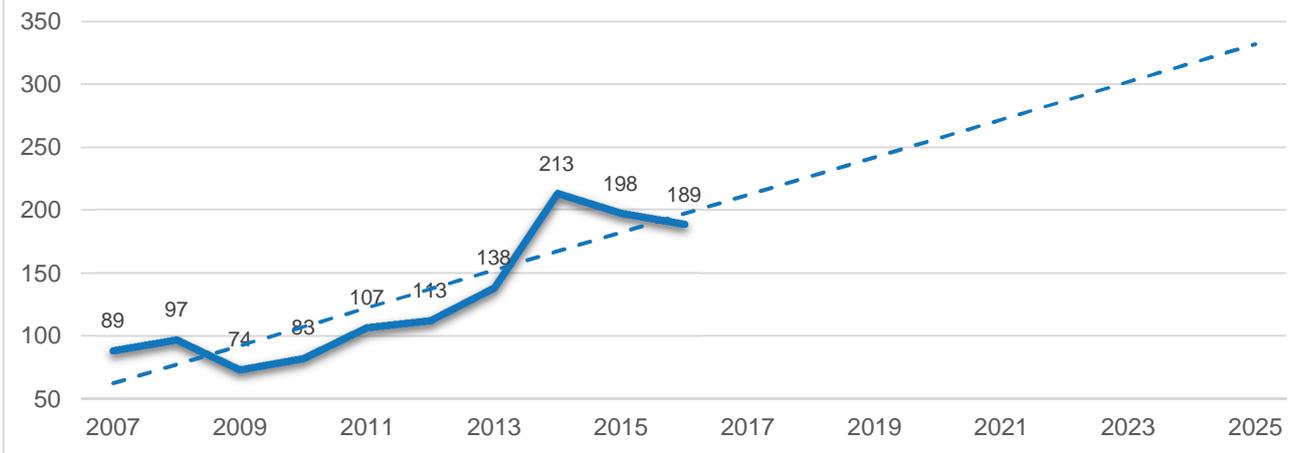
In the graphs below the analysis includes data of Building of ships and boats (301), Building of ships and floating structures (3011), Building of pleasure and sporting boats (3012), Repair and maintenance of ships and boats (3315), and Construction of water projects (4291).

The general development in the number of employees in the Marine construction sector for Estonia has been somewhat positive during the last decade as shown in Graph 9. It can be estimated that there will be around 2300 employees in total by 2030, if the depicted trend line turns into reality in the future.



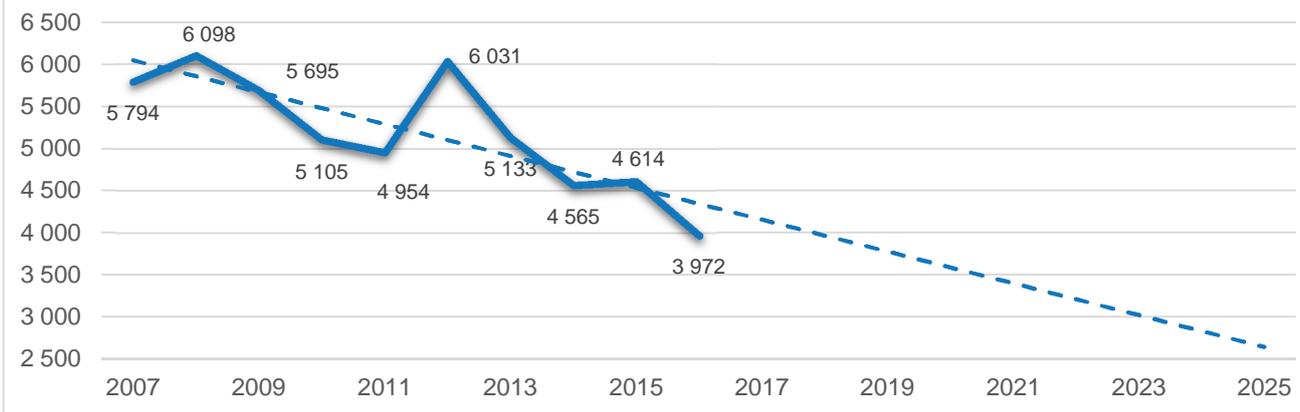
The ten-year turnover development for the Estonian marine construction sector also shows a positive trend among the 138 companies in Estonia. If the turnover development gets back on track, the industry will double its turnover figure already by 2030, amounting 400 million euros (see Graph 10 below).

Graph 10. Marine construction - EST - Operating revenue (Turnover) MEur (N138 companies)



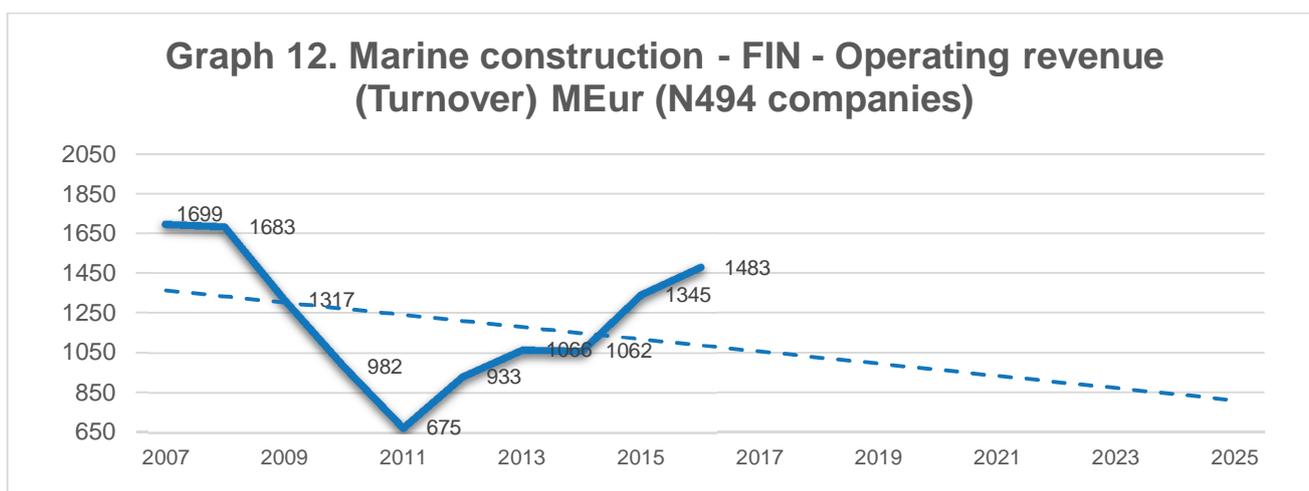
For Finland, there will be not less than 2500 employees in total working in 494 companies in the P4B area by 2030 (see Graph 11).

Graph 11. Marine construction - FIN - Number of employees (N494 companies)



In terms of the turnover development for the Finnish marine construction sector, the total turnover of the 494 companies will reach 850 million euros by 2025. The turnover development is shown in Graph 12.

Graph 12. Marine construction - FIN - Operating revenue (Turnover) MEur (N494 companies)



The reason for a decrease in turnover and in a number of employees in the Finnish marine construction may be due to outsourcing. In addition, the changes in ownership and management of the Finnish shipyards are considered a drawback that has resulted in a lack of long-term thinking also influencing the investments negatively (Nommela & Purju, 2016, p. 112).

Although the EU has banned direct subsidization, there has been a large amount of support aimed towards the marine construction industries through government actions, such as export guarantees, innovation support and supporting R&D through large research programs involving companies from the whole cluster. Shipbuilding has a high prestige and is regarded as nationally important in Finland as it has a big impact on employment. However, in some sectors the decreasing numbers of employees show that companies implement the automation of production and new technologies (Maritime Cluster Analysis, 2012).

New opportunities for both countries could be the renewal of the aging ferry fleet in Europe. New segments such as offshore and renewable energy will also need vessels with a high degree of innovation. Simultaneously, the competition is fierce as there is plenty of free capacity in the shipyards globally. There will also be stricter environmental regulations by IMO which will require new fuel types and machine technology solutions. (Nommela & Purju, 2016, p. 117). Currently, only a few LNG fuel ships sail on the Baltic Sea. Tallink as well as the Swedish company Rederi AB Gotland have made or intend to make contracts for the construction of one new ship that uses LNG as fuel. AS Tallinna Sadama has also contracted the building of four new LNG-ready (allowing transition to LNG fuel) passenger ferries for the shipping lines that connect Saaremaa and Hiiumaa (Strategic Environmental Assessment of Estonian Marine Strategy's Programme of Measures to achieve and maintain Good Environmental Status of Estonian marine area, 2015).

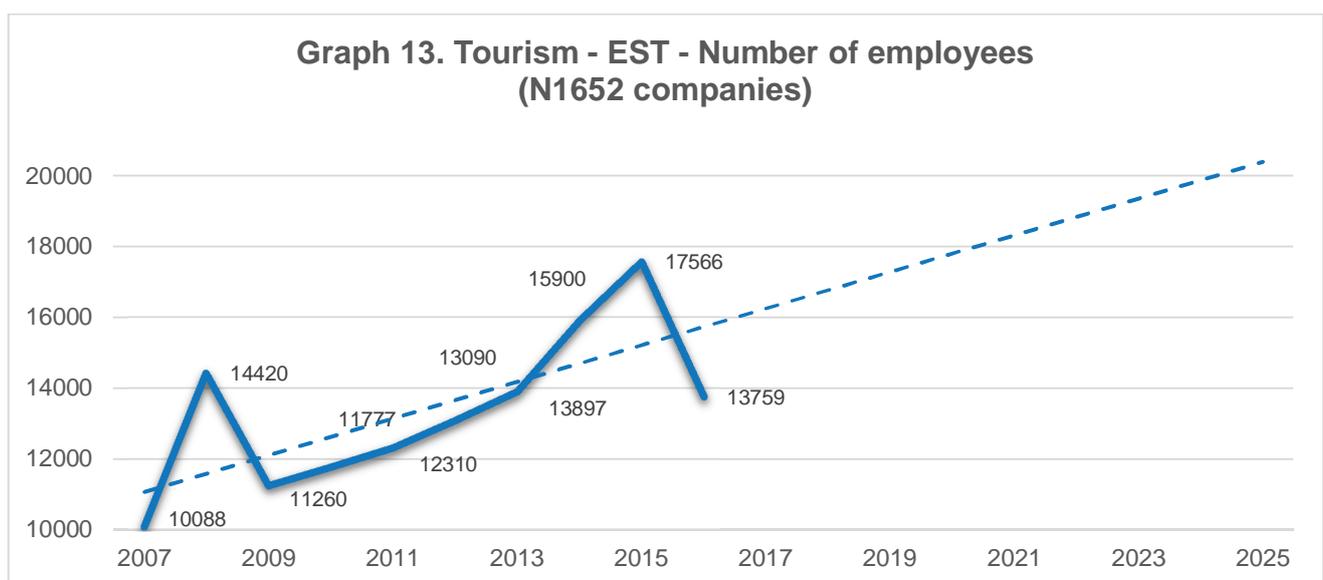
Maritime Tourism sector

Tourism ranks as world's third largest export category. Sea and coastal tourism is the largest sub-sector of tourism, the largest single maritime economic activity and the key economic driver in many coastal regions and islands in Europe (COM, 2014c). The significance of tourism and maritime experience industry is also recognised as one of the high-potential emerging areas in pursuing blue growth by the BSR countries (COM, 2012b). In Northern Europe alone the amount of international tourist arrivals has tripled since 1990, being over 80 million in total in 2016. Traditionally European

tourism has been heavily interregional (80 % of arrivals), however, the economic development especially in Asia has resulted that, for example, China overtook the USA as the world's largest outbound travel market in 2014 both in terms of generated arrivals and total travel expenditure (Croese, 2016). Arguably, the Chinese tourists are currently also among the most attractive target groups in European tourism market development, and at the EU-China Summit in 2016 the year 2018 was proclaimed to be "The EU-China Tourism Year". In the BSR cruise dialogue, cruising is considered a tourism product with high potential among non-EU tourists, particularly from China, and the intention is to build awareness of cruising by developing attractive thematic packages and promotion campaigns (Maritime affairs, 2016). For more information on the future directions and trends can be found in the *European strategy for more growth and jobs in coastal and maritime tourism COM* (2014), in which the European Commission reflected on the diversity of the coastal regions in EU and their capacity to generate wealth and jobs, in line with the EU's *Blue growth strategy COM* (2012).

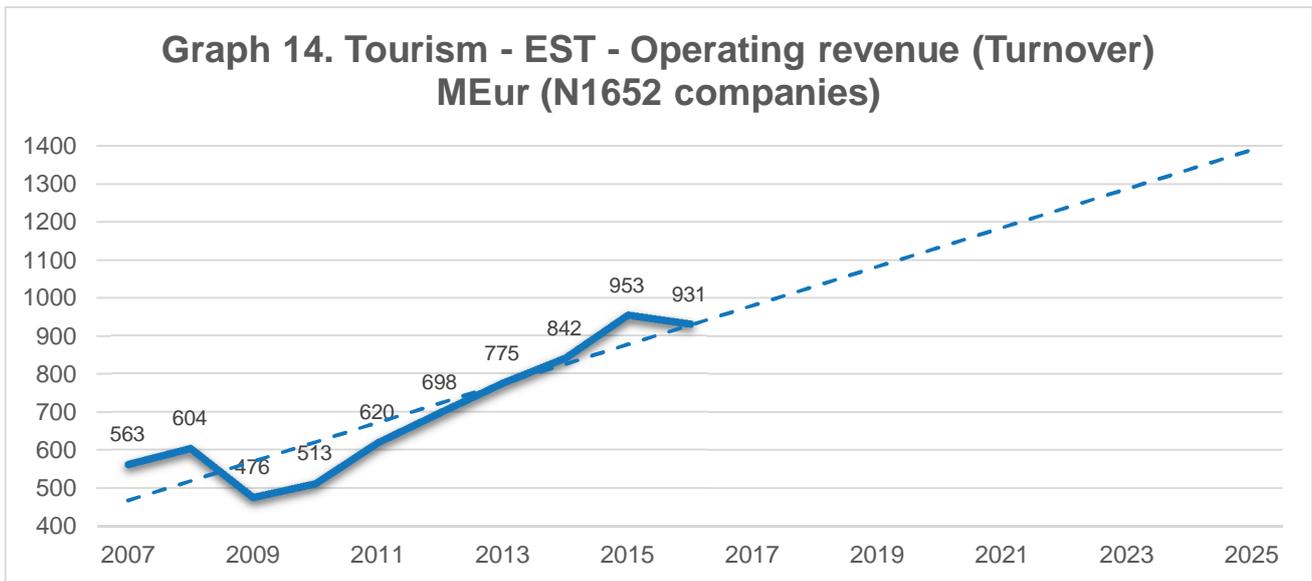
In Finland the value of the total expenditure by international visitors at collective tourism establishments was 2,7 billion and in Estonia the value of overnight international visitors was 1,5 billion euros in 2016 (UNWTO, 2017). These growth predictions along with their positive effects on the employment within tourism industry are likely to explain the positive estimates of the future development of (coastal) tourism. In the P4B project area Finland, the share of employment in the travel industry, adding up to almost 68000 employees, was reported to 5,5 % of the total share of employment in the P4B region in 2014 according to the national statistics (Visit Finland, 2017).

The analysis of the Tourism sector in Finland and Estonia includes data of Hotels and similar accommodation (551), Holiday and other short-stay accommodation (552), Camping grounds, recreational vehicle parks and trailer parks (553), Other accommodation (559), Restaurants and mobile food service activities (561), Beverage serving activities (563), Travel agency, tour operator reservation service and related activities (79), and Amusement and recreation activities (932). The employee and turnover development at the sector level for Estonia will be presented in the Graphs 13 and 14.

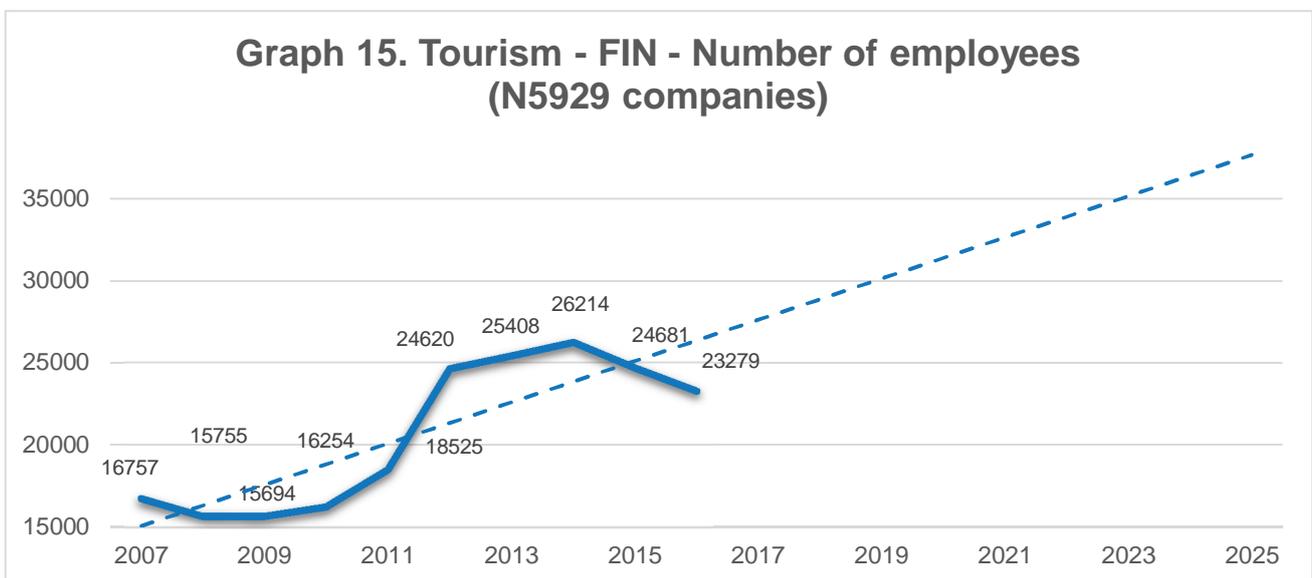


Following the positive trend line and growth expectations of tourism, and despite of the recent drawback in tourism sector employment level, by 2025 there will be over 20000 employees in the Plan4Blue Estonia region working in the tourism sector.

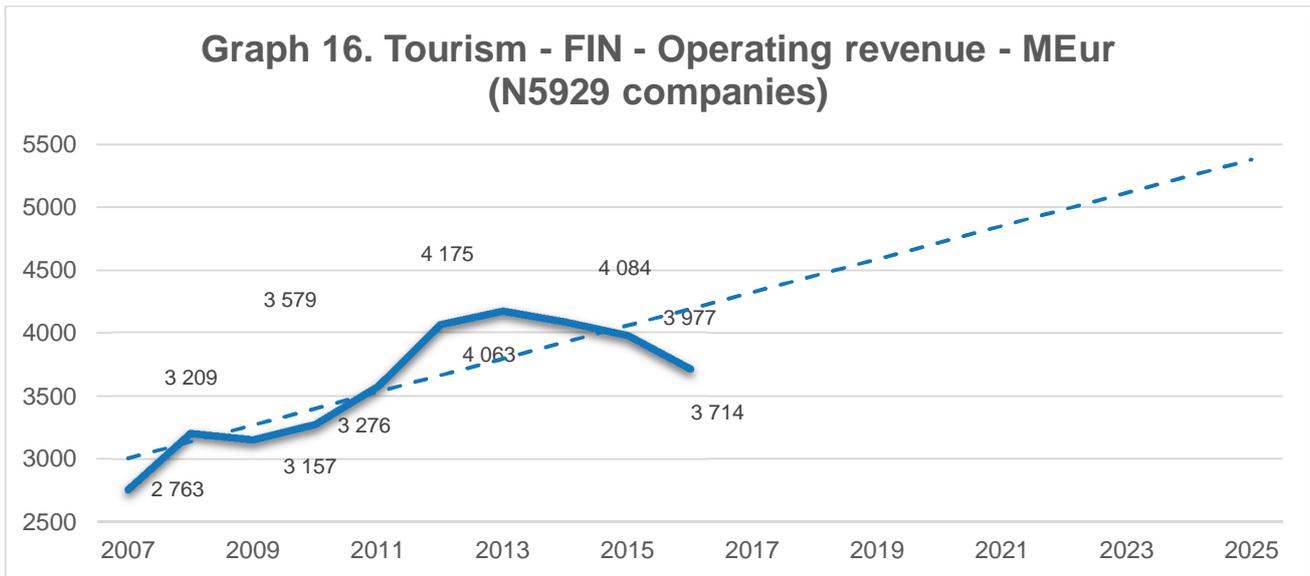
Coastal tourism is considered one of the key blue growth industries in the P4B region. The total turnover level has progressed firmly since 2009 and with the current development trend the industry will reach 1600 million euros level by 2030 in P4B Estonia region (see Graph 14).



Highly positive development in the tourism sector is also expected in the P4B region in Finland (see Graph 15). According to the linear trend line there will be 44 000 employees in the industry by 2030. This means almost doubling the current number of employees in the region. Digitalisation and self-service development may however influence these high predictions negatively. Since this is a global trend, even though high turnover levels could be reached, the use of labour might be much less intensive in the tourism service provision in a few decades' time.



In terms of the industry turnover, by 2030 the total level of 6000 million euros in the P4B region may be reached. For the turnover development see the Graph 16 below.



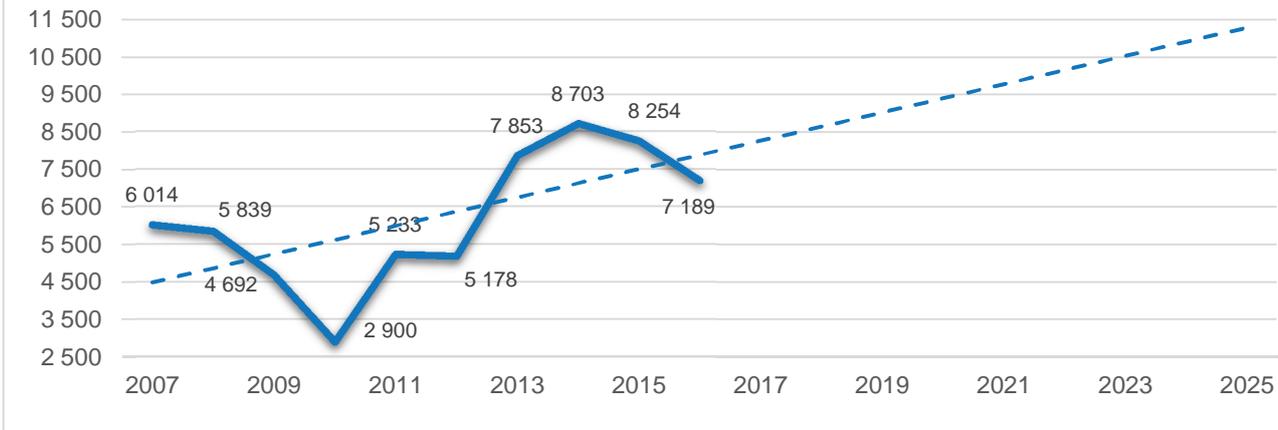
The data on the employee numbers in coastal and maritime tourism with reason shows that it is one of the growth sectors of the maritime economy in the BSR generating a significant number of jobs. It is noteworthy that the promotion of skills and maritime careers has been identified important also for this promising sector with a huge growth potential. The lack of suitable skills and competences as well as an ageing workforce have been identified as the problems for the future development (COM, 2014b).

Marine Energy sector

The energy sector in the P4B project area consists of all energy companies in Estonia and Finland that have two or more employees and annual turnover over 1000 euros. The following statistical sectors will be included in the analysis: Extraction of crude petroleum and natural gas (06), Support activities for petroleum and natural gas extraction (091), Manufacture of coke and refined petroleum products (19), Manufacture of industrial gases (2011), Electricity, gas, steam and air conditioning supply (35), Electric power generation, transmission and distribution (351), Distribution of electricity (3513), Manufacture of gas; distribution of gaseous fuels through mains (352), Manufacture of gas (3521), Distribution of gaseous fuels through mains (3522), Wholesale of solid, liquid and gaseous fuels and related products (4671).

The overall sectoral development can be characterised as positive in terms of company turnover and productivity (turnover/employees) figures. With the current development trend of the energy sector, based on the ten-year curve, the number of employees in the P4B Estonia region will reach over 11000 employees by the year 2025. The Graph 17 illustrates this positive development.

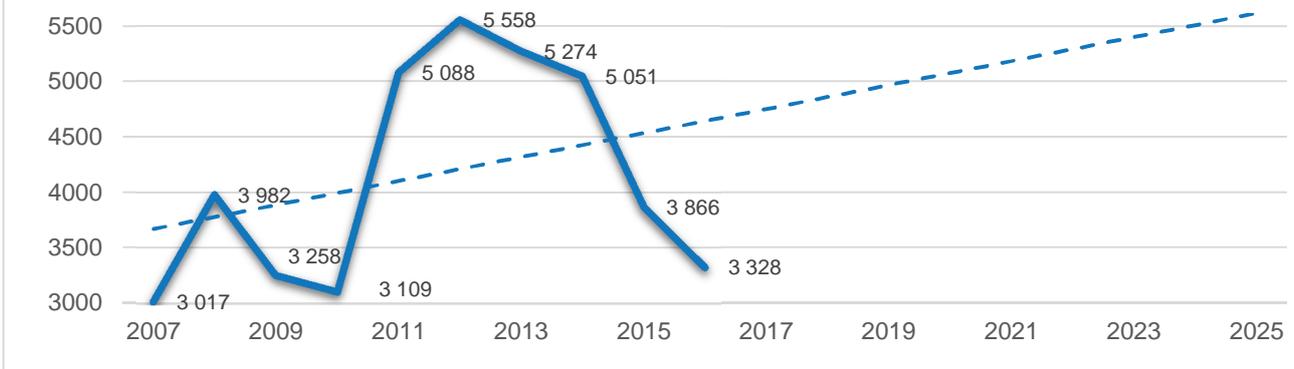
Graph 17. Energy - EST - Number of employees (N312 companies)



When considering the technological development, outsourcing trends and continuous innovations in the global field of energy, it can be assumed however, that the total number of employees in the energy companies in the P4B Estonia area may reduce in the future, even if the economic growth in the sector stays strong. A clear indication of this can be observed in Graph 19 depicting the energy sector development in Finland with the equivalent data.

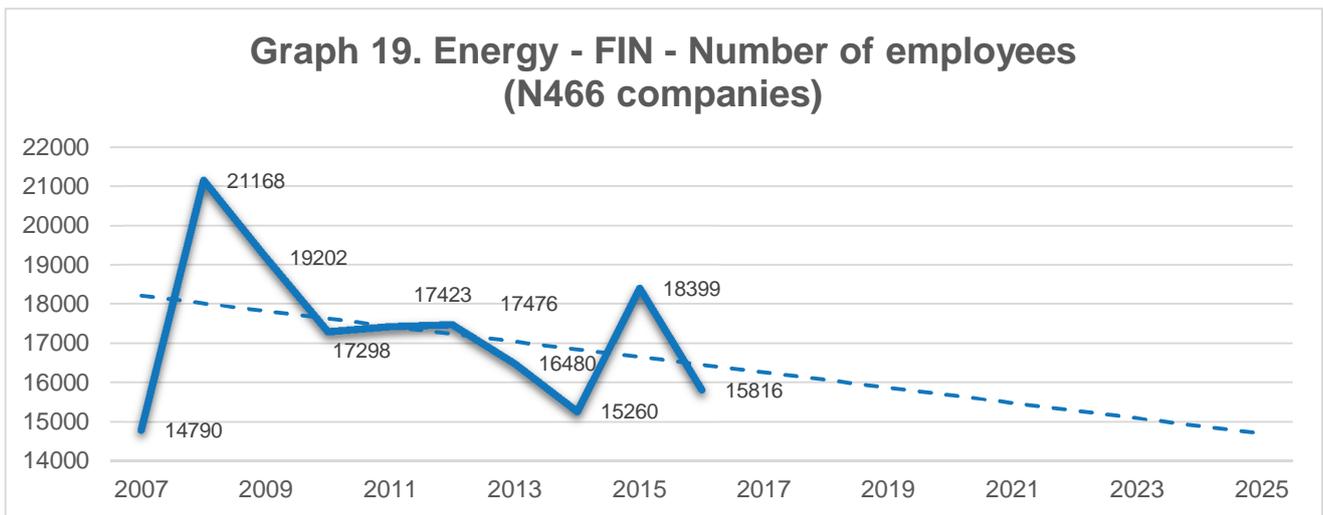
Despite of the perceived downturn in the turnover development within the energy sector in P4B Estonia area (see Graph 18), the linear development trend line reveals the long-term positive progress of the industry. New forms of energy are expected to offer novel growth opportunities globally and companies in the energy sector are increasingly adopting new high-tech solutions to improve their economic and environmental performance. Such developments are supported by market demand and increasing environmental legislation in the EU and on the national level, rising from the topical environmental concerns and continuous quest of improving industry competitiveness.

Graph 18. Energy - EST - Operating revenue (Turnover) MEur(N312 companies)

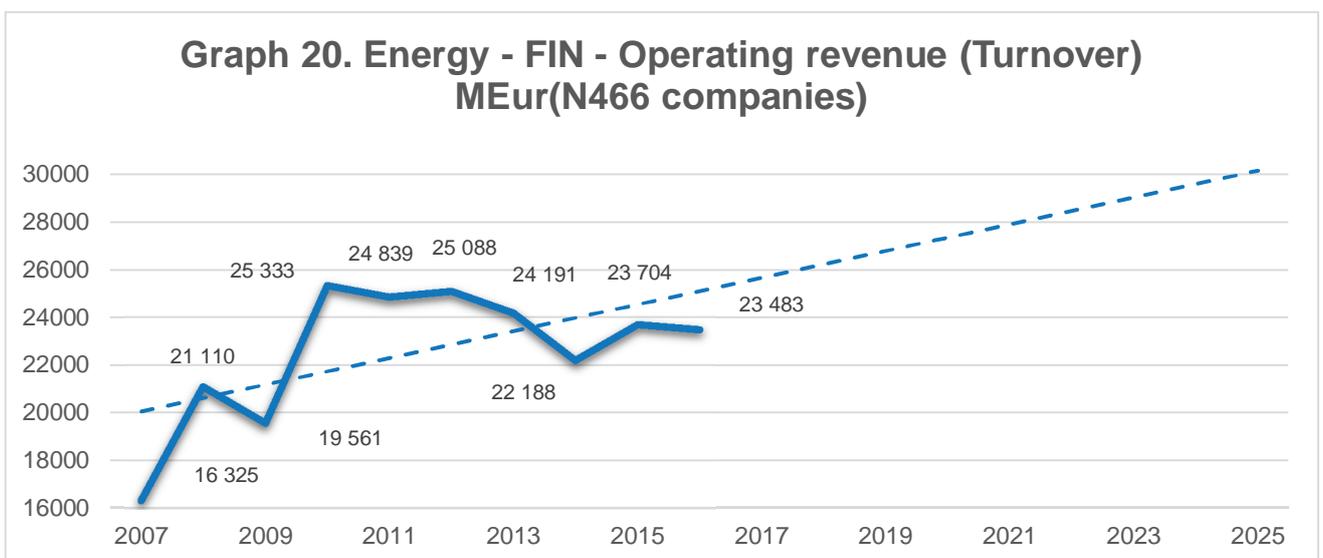


Should the linear trend predictions actualise, in the year 2025 the total turnover of the energy sector in P4B Estonian area will reach over 5500 million euros.

In the P4B Finnish area the number of employees working in the energy sector has been steadily decreasing during the last decade (see Graph 19). Economic growth, new forms of energy and the establishment of new energy production sites, for example, wind power stations around coastal areas, have not been able to maintain the number of company employees on the past levels. Partially this may be explained through outsourcing operations, when energy companies are increasingly utilising their external networks to provide supporting functions and operations, such as building and maintenance of the energy production sites. Thus, although the number of employees working in the energy companies is decreasing in Finland, there may be network effects that are not captured in this analysis.



According to the linear trend curve, it can be estimated that in the year 2025 there will be less than 15000 employees working in the energy sector companies in the P4B project area in Finland. Once again it should be stressed that despite of this seemingly negative trend of the employment development among the energy companies in Finland, future developments, including the previously stated outsourcing effect and decentralisation of energy production, may result in a less steep decrease in the level of employment on the regional economy level. To confirm and analyse this speculation further, new studies are needed to be carried out.



Out of the 466 companies identified for the analysis in the project area, only seven companies reach a turnover level calculated in billions of Euros. The top 100 companies include those that have a turnover level of 10 million euros or more. Almost 30 companies out of the top 100 ones reach a 100 million or above annual turnover level. When compared with other blue industries under investigation, the companies in the energy sector are performing well. Their turnover development is positive and the level of productivity is high compared with many other blue business sectors. Should the positive trend continue by the linear curve depicted in Graph 20, the industry turnover level in the year 2025 will reach 33000 million euros.

3. CONCLUDING REMARKS

Blue growth sectors have been identified as having high future growth potential and hence the revealed positive trend estimates were more or less expected. Despite of the possible fluctuations the ten-year development shows a clear positive trend in the development of industry turnover. What may be more difficult to estimate accurately is the number of new employees needed in some decades' time. Most industries are exploring various options and possibilities related to high-technology and digitalisation in their process improvements and new service development and thus, much less (service) employees will be needed in the future to create a higher level of customer value. What will continue to be key driving forces for sustainability are legislation and political factors. Proactively complying with the environmental legislation has been identified as a success factor for many marine technology companies, especially for those that produce cleantech solutions which directly address new regulation in the market (See for example Repka et al., 2017). Due to the higher level of employment and population density in the coastal regions in Finland and Estonia, the cities and communities in the area may be more resilient to market changes and hence, offering greater blue growth potential compared with the inland regions. Since population is aging in the EU and cultural diversity is increasing in the future, growth opportunities and new initiatives need to be carefully identified and evaluated to build competitive advantages.

High growth opportunities are expected to actualise already in the near future in the tourism sector, which should remain in the centre of the P4B cross-border blue growth development. To set realistic expectations and to get more perspective to the future development, according to COM (2012) tourism covers about half of the employment of the blue economy as a whole. Another indication for growth rate and potential lies with registered patents. According to patents directory accessed via Orbis Europe, out of around 12 000 maritime activities or products related patents registered in Estonia and Finland between years 1900 - 2016, 3500 patents are registered after year 2000.

To gain a deeper understanding of the blue business and growth dynamics, future studies should look into what characterizes the development and diffusion of blue business innovations and the adoption of new technologies across blue industries and markets. In order to achieve this, novel industry sub-sectors which have high growth potential should be selected for a closer investigation. The next step in the P4B analysis is to select these focal industries, which are most important for the MSP in the BSR area.

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