Employment trends in all sectors related to the sea or using sea resources

Main report

European Commission
DG Fisheries and Maritime Affairs

An exhaustive analysis of employment trends in all sectors related to sea or using sea resources

Final report for the European Commission, DG Fisheries and Maritime Affairs

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CONTENTS

PAGE

1.0 Introduction

Within the context of the growing number of economic and recreational sea related activities, the sea has increasingly become the subject of political debate and a need has been identified for a more holistic view on maritime affairs. Indeed, the new European maritime policy aims to develop an integrated approach to maritime activities that benefits Europeans, notably by creating economic growth and more and better jobs for EU citizens in a sustainable way[I].

The development of maritime policy requires a number of key issues to be addressed, including an understanding of the employment impact and trends of activities related to the sea or using sea resources. For example, in the past the economic and employment impact of activities related to the sea have been underestimated because of the rather narrow definition of the maritime cluster (including mainly activities related to shipping, ports and shipbuilding). The maritime cluster concept has not traditionally comprised activities such as coastal tourism, cruise tourism, offshore and coastal wind energy – all of which are strong growth sectors in Europe. Furthermore, an effective implementation of European policies in the maritime field requires an assessment of the policies aimed at boosting sea related employment.

This study was commissioned to provide a better and more holistic picture about employment and employment trends in the maritime sectors at European and national levels. The study also aims to identify potentials for growth and increased employment in these sectors, and the type of policy action necessary to realise that potential. To be more specific, the following have been the key objectives for the research[II]:

- **Analysis of current employment trends**

An overview is to be provided of existing data and analysis that provide indications of the employment trends in economic sectors related to the sea or using sea resources within the European Union. Trends should include as far as possible current levels of employment and percentage changes over the past decade for the European Union as a whole and for each Member State. The overview should also point to existing frictions on the labour market.

The overview should also include, to the extent possible, a forecast for the coming ten years, based on identified sectoral projections and trend analysis as well as interviews of economic actors. The study should point to areas of activity with important information

[I] European Commission, DG Fisheries and Maritime Affairs.
[II] As outlined in the Terms of Reference FISH/2005/31

gaps that need to be filled to allow well-founded policy decisions. It should indicate those areas of activity where further data collection and analysis would be necessary or where methods for data collection in these areas would need to be refined.

- **Identification of potentials for growth**

The study should provide an assessment of the strengths and weaknesses of the activities related to the sea or that use sea resources in the European Union, compared to other major OECD countries. Based on this, the study should point to opportunities and threats for the economic activities covered, hereby focusing on their effects on employment.

- **Possible policy actions**

Recommendations should be formulated as to the areas where public intervention can play a substantial role in facilitating the exploitation of opportunities or in taking action to counter threats which can have a positive effect on sustainable job creation. For each of these areas, the study should recommend types of policy action that could be envisaged. Hereby examples of good policy practice should be used to illustrate possible actions. A distinction is to be made for policy actions at EU, national and regional level.

This study links with the drafting and discussion of the 2006 Green Paper on Maritime Policy[I].

1.1 Study sectors

The scope of this research has been to assemble and analyse existing data from previous studies rather than to gather primary data[II]. A previous study on a number of maritime sectors conducted by Policy Research Corporation produced a classification of the maritime sector, which this study aimed to follow[III].

At the same time, this study also aimed at analysing employment created by other sea related sectors, such as coastal tourism, the navy, renewable energy and offshore oil and gas extraction.

The study did not examine employment related to fisheries or seafood processing as a separate study[IV] requested by the European Commission was already underway. A

[I] COM (2006) 275 final "Towards a future maritime policy for the European Union: A European vision for the oceans and seas"

[II] Although in some sectors where data was missing altogether, primary data was gathered through interviews with key stakeholders, which cannot however be always regarded as comparable or representative, but aims to give an indication of sector size and broad trends.

[III] This study excludes inland navigation.

[IV] This study uses findings from a study by LEI BV and Framian BV (2006) *Employment in the fisheries sector: current situation* (FISH/2004/4) – this is one of the several European level studies looking at fisheries related employment.

summary of these study findings has been included in this overall report, with a view to provide a comprehensive insight into the employment situation in the maritime sectors in Europe.

The sectors analysed in-depth as a part of this study are:

Study sectors	
Shipbuilding	Building and repair of sea-going vessels and vessels intended for travel on inland waterways, and scrapping.
Marine equipment	The manufacturing of, and wholesale trade in marine equipment.
Seaports and related services	Cargo handling, shipping related activity (storage, agency, maritime logistics and expedition), management and administration of ports and pilotage.
Recreational boating	Construction and repair of recreational vessels, yachts and boats, and supporting services (trade of and trade in recreational vessels, renting, running of marinas).
Shipping	Merchant shipping, ocean towage, short sea shipping, chartering-out.
Offshore and coastal wind energy	Manufacturing, installation and maintenance of offshore and coastal wind turbines.
Offshore oil and gas extraction	Construction, installation and conversion of platforms, storage vessels and equipment, drilling, off-shore related transport, engineering, communication, consultancy and other support.
Coastal tourism	Employment generated by tourism activities on the sea or within 50km from the coast (accommodation, restaurants and cafes, tour operators, travel agencies and tourist attractions).
Maritime works	Dredging (capital, maintenance and remedial) of docks, harbours, approaches, river jetties and major navigation channels; Construction of new land in the sea; Coastal protection; Manufacturing, laying and maintenance of underwater cables; and Maritime related construction.
Maritime services	R&D, maritime education and training, classification and inspection, support services (bunkering, ship supply, rescue, diving, maritime insurance, financing, brokerage, law and medical services, crewing, maritime associations, maritime government services)
Marine aggregates	Extraction of marine aggregates.
Navy	Naval officers in armed forces.

2.0 European overview – current level of employment

All sea related sectors generated approximately 5 million jobs in 2004/2005[I]. As shown by the map below, Spain and the United Kingdom hold the highest share of employment with Spain employing 37% of people in the European sea related activities with over 1.8 million employees. Spain is followed by the United Kingdom with 613,000 employees (12%) and France with 486,000 employees (9.7%).

These three countries are followed by Greece (5.9%), Germany (4.9%), Italy (4.5%)[II], the Netherlands (4.3%) and Poland (4.1%) each providing 200,000-300,000 jobs in the sea related sectors. Unsurprisingly the most marginal employment levels were found in the landlocked countries Hungary, Czech Republic, Slovakia and Luxembourg.

Due to the predominance, and also at the same time unreliability, of data on coastal tourism employment[III], the current level of employment has also been calculated for the more traditional maritime industries alone. Employment in these maritime sectors[IV] in the EU-25 amounted to 1.9 million in 2004/2005.

France holds the highest share of employment in traditional maritime activities with 241,000 jobs and by comprising nearly 13% of total maritime employment in Europe. France is closely followed by the United Kingdom and Italy where maritime related sectors directly contributed to the creation of 232,000 and 227,000 jobs respectively, making up

[I] The figures are predominantly from 2005 for Cyprus, Czech Republic, Spain, Luxembourg, Austria, Finland, Estonia, Hungary, Slovakia, Lithuania and Sweden; and predominantly from 2004 for Latvia, Belgium, Poland, Germany, Italy, Ireland, Greece, Slovenia, UK and Malta. Exceptions are; Portugal where the figures mainly relate to 2003; Denmark and the Netherlands with figures from 2002 and the most employment data for France is from 2001. These aggregated calculations are based on data from national sources. There is likely to be some overlap in figures for recreational boating and coastal tourism. Furthermore, in most study countries coastal tourism employment, as defined in this study to include all tourism related employment within 50 km from the sea, is likely to be an over-estimate of employment in this sector due to the lack of available studies for this sector.

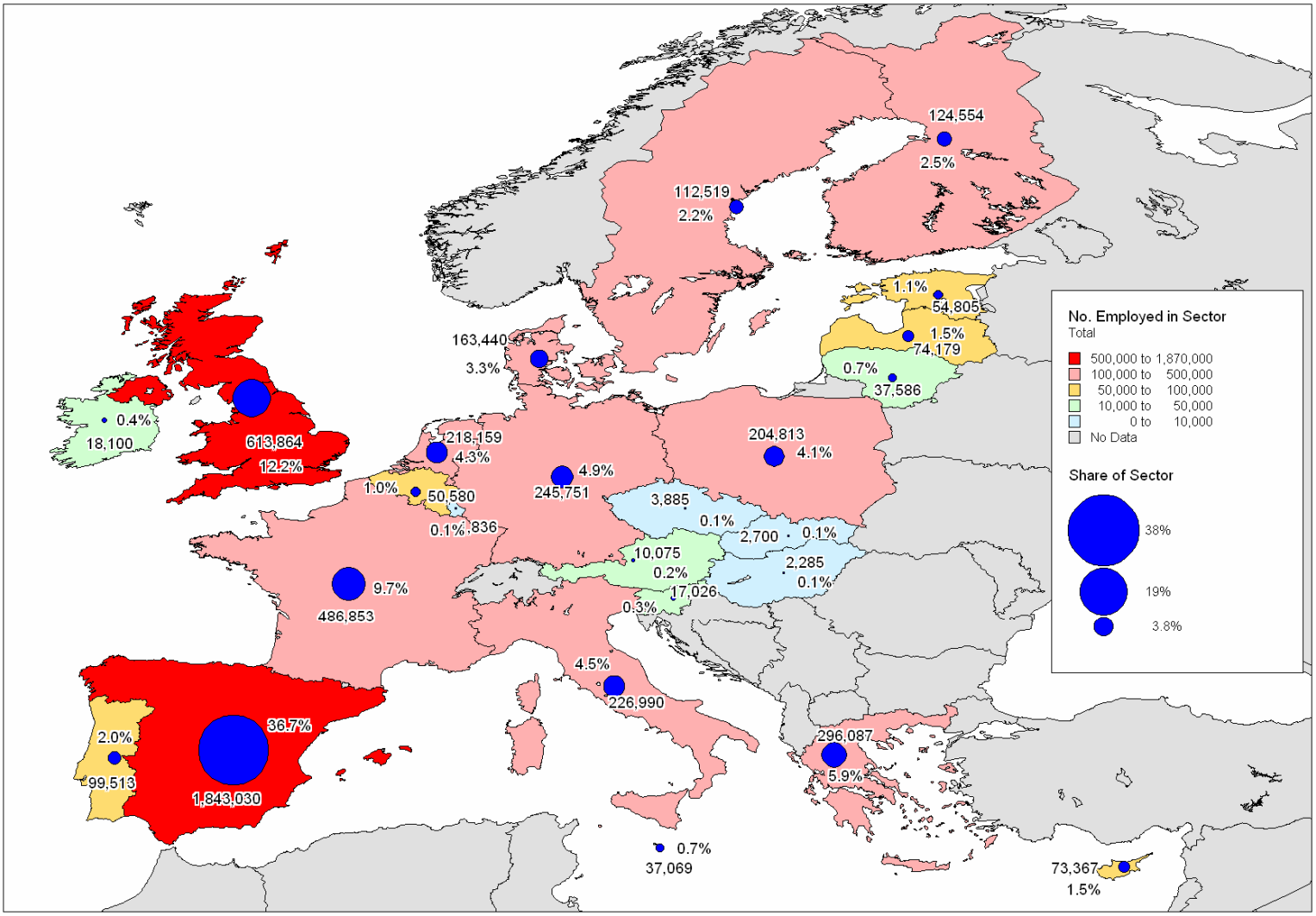
[II] It must be noted that no reliable data was available for coastal tourism in Italy and therefore the current figure of total sea related employment for Italy is an under-estimate of actual situation.

[III] Coastal tourism related employment has only been studied in France as a part of their maritime cluster – therefore most of the figures are likely to be over-estimates of actual coastal tourism employment. Until more precise methods of data gathering for this specific sector are available, any figures presented in this report related to coastal tourism (apart from France) must be regarded with a degree of caution.

[IV] Shipbuilding, Marine equipment, Seaports & related services, fisheries and seafood processing, Recreational boating, Shipping, Offshore and coastal wind energy, Offshore oil and gas extraction, Maritime works, Maritime services and Marine aggregates. Navy employment is also excluded from this alongside with coastal tourism because information was only obtained for 9 study countries. These aggregated figures are based on information from national experts rather than sectoral analyses of this study. Sectoral analyses for recreational boating and offshore and coastal wind energy are based on previous sectoral studies – rather than on data from national experts.

12% of total employment in Europe each. Germany is another EU Member State where the traditional maritime activities, as defined in this study, provide over 200,000 jobs. Only three other countries; Poland, Denmark and Greece employ over 100,000 individuals in the core maritime sectors.

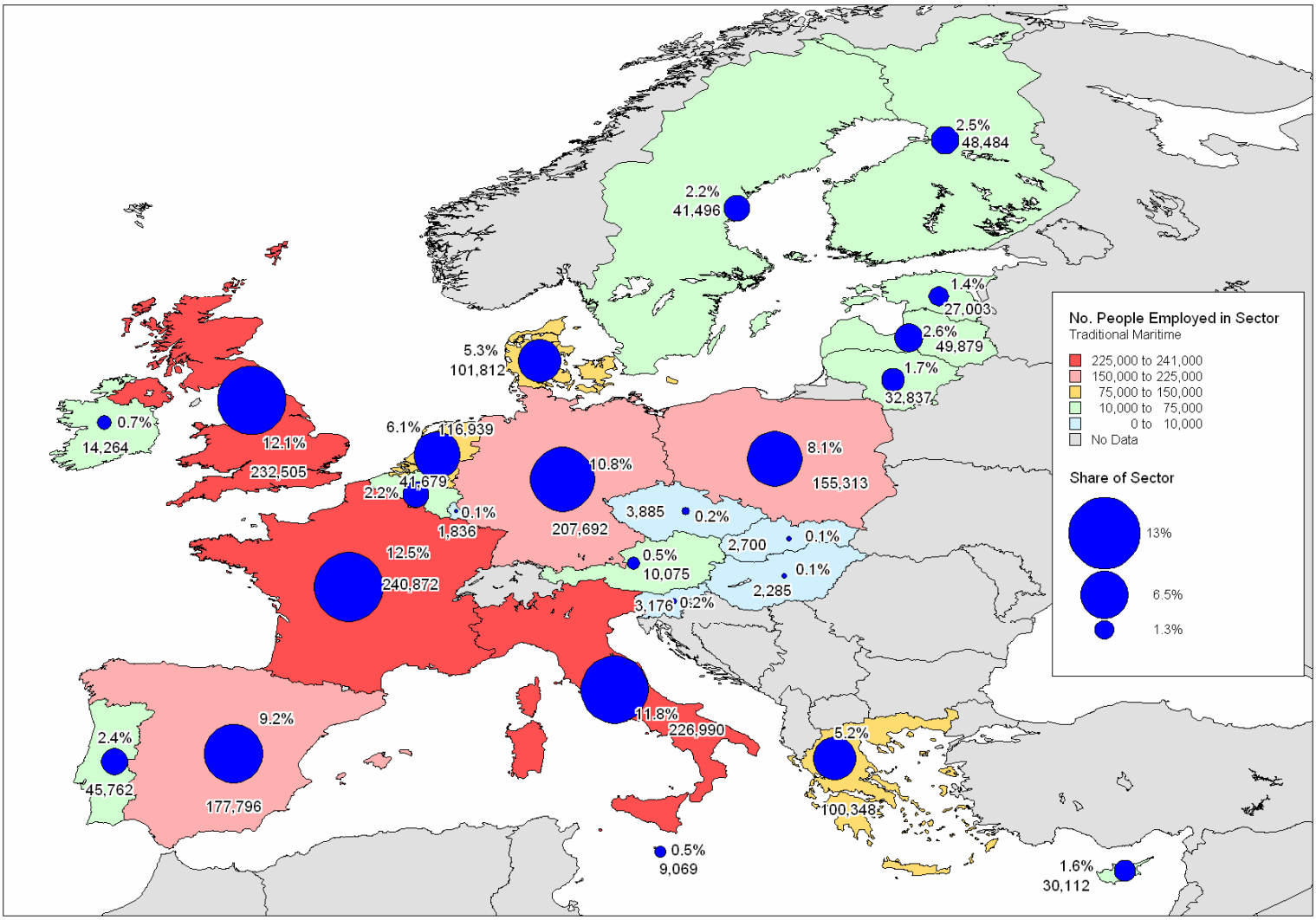
Map 2.1 Employment in all sea related sectors, 2004/2005[I]



Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

[I] Coastal tourism related employment has only been studied in France as a part of their maritime cluster. Therefore, researchers of this study strongly recommend a more in-depth analysis of coastal tourism employment in Europe before making final conclusions about the extent of employment in this sector.

Map 2.2 Employment in traditional maritime sectors - EU-25, 2004/2005[XII]



Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

As the maps above provide the level of employment for all of our study sectors - plus fisheries[XIII] – for the clarification purposes the following table summarise the sea related employment in all of the study countries on the basis of our study findings and together with fisheries sector employment.

[XII] These figures include Shipping, Shipbuilding, Marine equipment, Recreational boating, Seaports and related services, Offshore supply, Marine aggregates, Maritime services, Fisheries, Maritime works and Coastal & offshore wind energy.
[XIII] As already mentioned, this study did not examine employment related to fisheries or seafood processing as a separate study for the European Commission was already underway.

	Our study findings (excludes fisheries)	**Our study findings without coastal tourism and navy** (excludes fisheries)	**Fisheries**[XIV]	**Total maritime employment** (all study sectors + fisheries)	**Traditional maritime employment** (includes fisheries but excludes coastal tourism and navy)
AT	9,341	9,341	734	10,075	10,075
BE	48,837	39,936	1,743	50,580	41,679
CY	72,192	28,937	1,175	73,367	30,112
CZ	1,618	1,618	2,267	3,885	3,885
DK	149,380	87,752	14,060	163,440	101,812
EE	48,105	20,303	6,700	54,805	27,003
FI	121,814	45,744	2,740	124,554	48,484
FR	422,141	176,160	64,712	486,853	240,872
DE	229,342	191,283	16,409	24,5751	207,692
GR	258,386	62,647	37,701	296,087	100,348
HU	605	605	1,680	2,285	2,285
IE	7,516	3,680	10,584	18,100	14,264
IT	179,033	179,033	47,957	22,6990	226,990
LV	63,599	39,299	10,580	74,179	49,879
LT	31,021	26,272	6,565	37,586	32,837
LU	1,836	1,836	-	1,836	1,836
MT	35,628	7,628	1,441	37,069	9,069
NL	209,110	107,890	9,049	218,159	116,939
PL	184,890	135,390	19,923	204,813	155,313
PT	66,284	12,533	33,229	99,513	45,762
SK	1,520	1,520	1,180	2,700	2,700
SI	16,403	2,553	623	17,026	3,176
ES	1,755,720	90,486	87,310	1,843,030	177,796
SE	108,564	37,541	3,955	112,519	41,496
UK	580,330	198,971	33,534	613,864	232,505

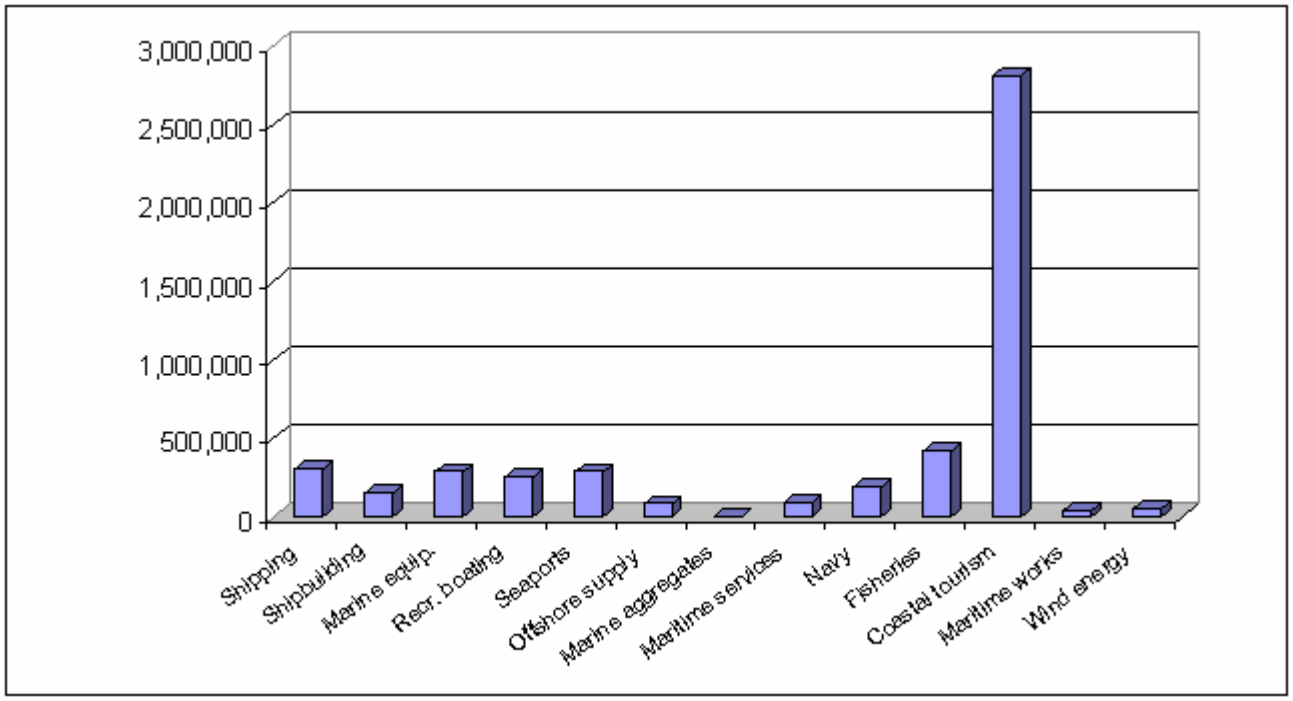
Source: ECOTEC Research & Consulting, 2006 (Please see individual country chapters for data sources)

When analysing the share of different maritime sectors from total maritime related employment, it is clear from the graph 2.1 below that coastal tourism is by far the largest sea related sector in the European Union. However, no final conclusions can be drawn on the exact level of employment in the coastal tourism sector as the availability of accurate

[XIV] Fisheries related employment is taken from a study 'Employment in the fisheries sector: current situation' by LEI BV and Framian BV (2006).

information on this sector is limited[XV] and data from many countries present an over-estimate of coastal tourism related employment[XVI]. Further data collection for this sector is urgently required at the Member State level. Coastal tourism is followed by the fisheries sector with over 420,000 employees and maritime transport with 303,000 employees.

Figure 2.1 Share of different maritime sectors, 2004/2005[XVII]



Source: ECOTEC Research & Consulting, 2006

The fisheries sector is the largest sector with its workforce constituting just over a fifth of total employment (22%) if we analyse the share of employment in sea related sectors *without* coastal tourism and navy (see the graph overleaf). Marine transport is the second largest sector of the more traditional maritime activities employing some 313,000 workers across the EU Member States. The shipping sector is very closely followed by marine equipment, which also represents 15% of total employment (287,000). Seaports and recreational boating generate 284,000 and 253,000 jobs respectively, with a 13-14% share of total employment each.

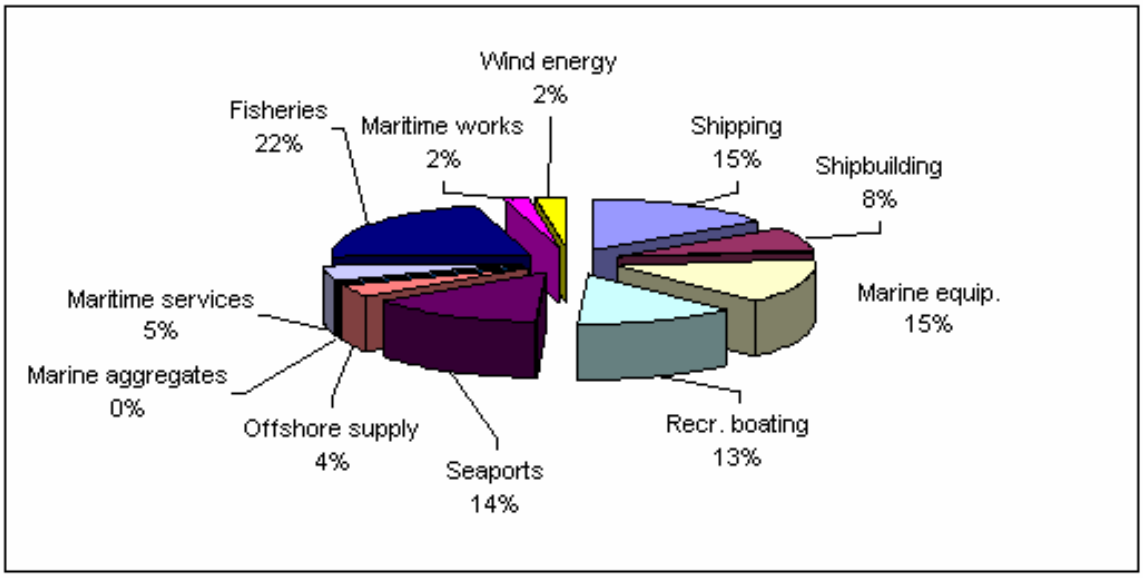
[XV] The scope of this study only allowed an analysis of employment in this sector on the basis of national studies.

[XVI] France is the only country where employment in this sector has been studied in detail. Methodologies for data collection for this sector for all other countries have varied from country to country and with current methods a large majority of countries in this study present an over-estimation of total coastal tourism (as defined, tourism employment within 50km from the sea).

[XVII] Statistics for offshore and coastal wind energy mainly refer to the year 2002; Recreation boatin 2003Shipbuilding, coastal tourism, statistics mainly refer to 2004; shipping, oil and gas navy, seaports 2005, marine equipment, maritime works 2004/2005, maritime services 2005/2006

Maritime services sector is one of the most marginal sectors in terms of employment (88,000 employees), although this is also partly due to the lack of systematic data collection. The same applies to offshore and coastal wind energy; however it is a sector with a strong regional economic impact and displays a particularly strong growth potential. Maritime works sector (2%) also suffers from the lack of systematic data collection, apart from its largest sub-sector - dredging industry - which makes up nearly half of the maritime works related employment by employing close to 17,800 workers directly and further 35,500 indirectly[XVIII].

Figure 2.2 Share (%) of employment, excludes coastal tourism and navy

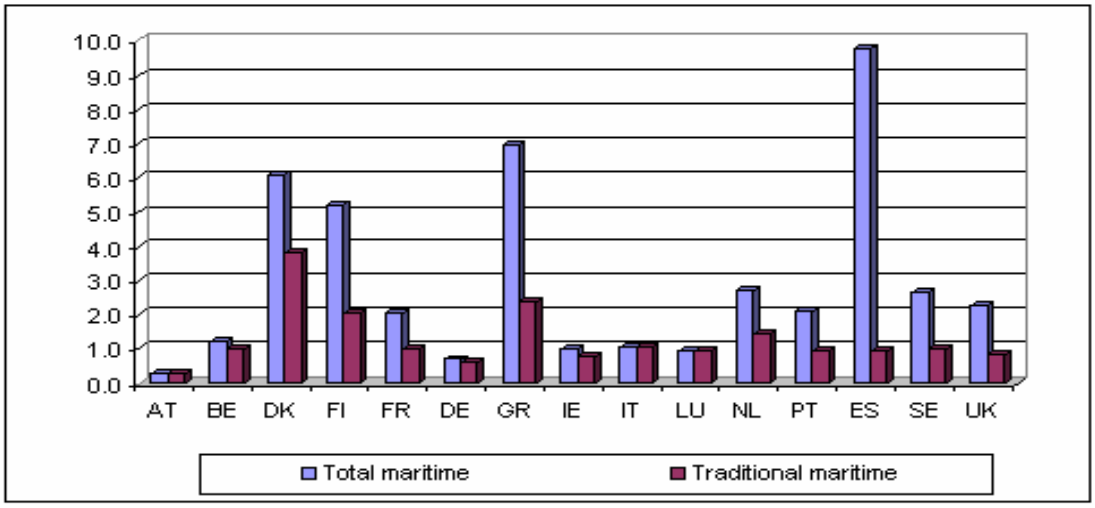


Source: ECOTEC Research & Consulting, 2006

If we analyse the share of all sea related activities and traditional maritime activities (excluding coastal tourism and navy) from total employment (16-64 year olds) in each EU country, the graph below shows that sea related activities constitute the largest share of total employment in Spain from all the EU-15 countries. Indeed, employment in sea related sectors, mainly coastal tourism, make up nearly 10% of total employment in Spain (see figure 2.3 below). Traditional maritime activities (excluding coastal tourism and navy) hold the highest share of total employment in Denmark and Greece from the old Member States.

[XVIII] EuDA, 2006

Figure 2.3 Share of maritime employment from total employment, EU-15[XIX]

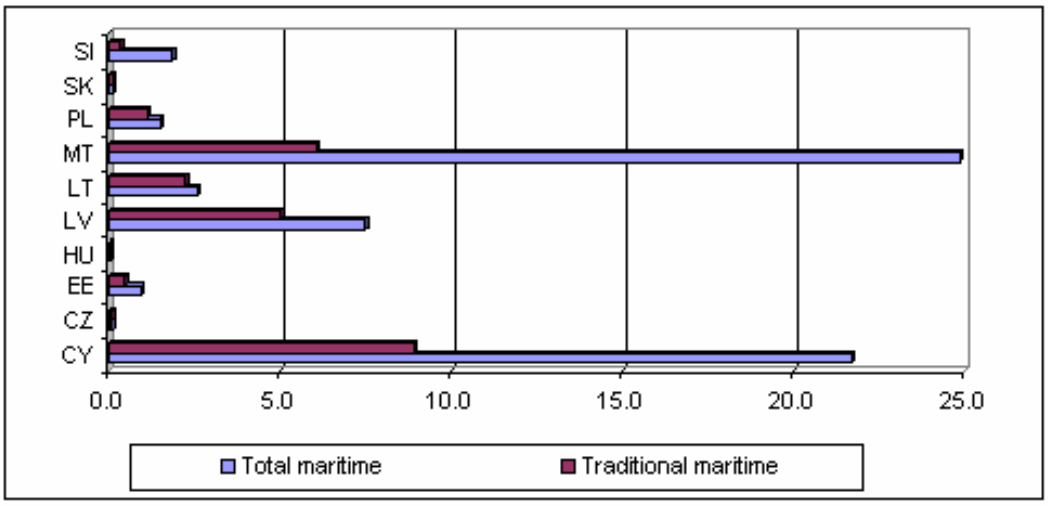


Source: ECOTEC Research & Consulting, 2006 and Eurostat, 2006

Maritime activities are vitally important sectors for the economies of Malta and Cyprus where all sea related activities comprise over a fifth of total employment. In Malta all maritime sectors make up around a quarter of total employment in the country. Cyprus holds the highest percentage of traditional maritime employment from total employment; traditional maritime activities employ nearly 9% of the total 16-64 year-old workforce in the country.

[XIX] These figures should be regarded as indicative of the share of employment. The figures refer to 2005 for Spain, Luxembourg, Austria, Finland and Sweden; and 2004 for Belgium, Germany, Italy, Ireland, Greece and the UK. Exceptions are; Portugal where the figures mainly relate to 2003; Denmark and the Netherlands with figures from 2002 and the most employment data for France is from 2001. Total employment figures refer to Eurostat data for total employment (2001-2005) for the employment of 15-64 year olds.

Figure 2.4 The share of maritime employment from total employment[xx]



Source: ECOTEC Research & Consulting, 2006 and Eurostat, 2006

[xx] These figures should be regarded as indicative of the share of employment. The figures are predominantly from 2005 for Cyprus, Czech Republic, Estonia, Hungary, Slovakia and Lithuania; and predominantly from 2004 for Latvia, Poland, Slovenia and Malta. Total employment figures refer to Eurostat data for total employment (2001-2005) for the employment of 15-64 year olds.

3.0 Shipbuilding

The European shipbuilding industry has gone through a period of significant transformation over the last 25 years. This has been induced by research and technological advancement, increases in global competition, and political and economic changes in many of the countries of the enlarged European Union. In global terms, taking together civil and naval shipbuilding, repair and conversion as well as its suppliers, the shipbuilding sector constitutes the third largest growth market in the global maritime cluster between 2005 and 2010, according to a 2005 study by Douglas Westwood[I]. Its performance is only surpassed by projected increases in shipping and coastal tourism.

These positive projections however have to be seen in the European context and against a background of a significant decline in shipbuilding employment, which reduced Europe-wide employment in the sector from 461,988 in 1975 to 116,696 in 2004[II] and significant uncertainty and overcapacity in the world markets. The latter is particularly due to the strong entry into the market of competitors from Asia, with China and Korea in particular more than doubling their capacity over the last 10 years.

Historically, the shipbuilding sector has enjoyed a strong political position due to high levels of employment and the strategic importance of the sector related to its strategic role in maintaining many countries defence capacity[III]. Also, the shipyards provide employment for various subcontractors and module makers. It also acts as an important economic multiplier with spin-offs into other ancillary sectors.

This chapter sets out economic trends in the sector, pointing out the strengths, weaknesses, opportunities and threats facing the European shipbuilding industry. It will go on to illustrate employment trends and future employment projections, paying particular attentions to the changes in employment profiles and skills requirements.

3.1 Economic impact

According to the Community of European Shipyards Associations (CESA), the European shipbuilding industry today produces an annual turnover of €10 billion turnover for new builds, naval shipbuilding and ship repair[IV]. Other sources estimate the value of the sector

[I] Douglas Westwood for University of Kiel; World Marine Markets, 2005
[II] The figures are based on employment in CESA member yards.
[III] Marine equipment. New insights into a lucrative market sector, Drewry Shipping Consultants, August 2002.
[IV] LeaderSHIP 2015 Factsheet: however, it must be noted that CESA data rarely includes military shipyards.

sector at €13 billion in 2004[I]. Approximately 300 shipyards constitute the core of the industry and more than 9,000 companies represent its large network of suppliers. The largest European shipbuilding nation in terms of output is Germany (fourth position in the world with 3.4% of the global market share), followed by Poland (fifth position in the world with 2.3% of the global market share in 2004[II]). Other countries where the sector is significant in European and global terms are Italy and the Netherlands; they made up €2 billion and 2% of the global market share in 2004[III].

Over the last 10 years there has been a constant increase in global shipbuilding capacity[IV]. At present, European shipyards account for 20% of this capacity, which despite presently relatively healthy order books, is rarely used to its full potential. At the end of 2003, European shipyards were able to fill only 60% of their total capacity but in 2006 EU yards have been utilised nearly to their full capacity[V].

Many of the Asian yards operate at full capacity. This trend demonstrates the increasing competition with the Asian countries[VI]. Starting in the early 1990s, South Korea began the process of expanding its shipbuilding capacity with the aim of becoming a world leader in this sector. With the benefit of significant state investment, South Korea's shipbuilding capacity has tripled in that period. Industry analysts maintain that this, together with the expansion of the shipbuilding sector in China, have significantly contributed to global overcapacity and a destructive "price war" in the international shipbuilding market[VII]. More recently the devaluation of the Korean currency has given Korean yards additional competitive advantage[VIII]. Question marks have repeatedly been raised by the WTO regarding distortions in competition caused by what are considered to be direct and indirect subsidies provided by the national government to South Korean shipyards. However, so far, such actions have been unsuccessful.

The question of global competition rules and the provision of financial assistance to the industry, as well as the award of large naval contracts are highly significant for this sector. Despite being faced with global competition and external factors affecting the industry, such as fuel prices or currency exchange rates, it is argued that this has not translated into globally applicable trade rules on subsidies and anti-dumping measures[IX]. In its report and

[I] Marine industries global market analysis, p.109
[II] CESA Annual Report 2004-2005, data for Poland, p.60-61
[III] VNSI Annual Report 2004
[IV] Global shipbuilding requirement and capacity, CESA Factsheet
[V] DG Tren, 2006
[VI] Maritime economy. Statistic review, Maritime Institute Gdansk, Gdansk 2004, p.143
[VII] CESA, LeaderSHIP report
[VIII] European Parliament Factsheets, Factsheet No 4.7.3. Shipbuilding, 13.09.2004
[IX] LeaderSHIP 2015, Defining the future of the European shipbuilding and ship repair industry, European Commission, 2003

recommendations, the high level group on the future of the shipbuilding sector argued that this lack of effective regulatory environment at has impeded the development and functioning of the industry and poses particular threat to the European industry. Subsidies available in certain countries, but not in others are seen to distort prices in the sector and therefore force the shipyards to compete with each other at low costs. Since European shipyards are not well placed to compete on price, they increasingly suffer reductions in capacity, output and, consequently, employment[I].

CESA has analysed future requirements in worldwide shipbuilding capacity. The organisation expects global capacity to grow to 31.2 million CGT by 2010. Seen against the background of the OECD's assessment of an annual requirement of 22.8 million CGT in new build vessels, it can be assumed that for the foreseeable future, shipbuilding capacity will outstrip demand by approximately 30% leading to a further wave of global competition, which could have a detrimental impact on European shipyards[II]. This results in a paradoxical situation in which there is a high demand for ships but the prices are decreasing. This consequently can lead to enormous financial difficulties for European shipyards[III].

Following a particularly lean period, in 2003 and 2004 some large shipyards were forced to close with substantial job losses. In addition, some countries were forced to redefine their involvement in shipbuilding in general (such as Sweden)[IV]. Experiences from Latvia illustrate the process of restructuring, where most of the shipyards were focused on naval construction and repair under COMECON. After the fall of the Soviet Union, the customer base has expanded and now includes Scandinavian countries. Also, the focus of the shipyard construction has shifted towards merchant vessels.

Industry representatives argue that without significant state intervention from national or European policy makers, it is unlikely that the situation of decline will change in the years to come. As a result, a high level expert group consisting of Commission, national and industry representatives, was established in the early 2000s to assess the situation and to make policy recommendations.

The key strengths of the European shipbuilding industry compared with its Asian counterparts lie in its strong tradition, highly skilled workforce and labour productivity, as well as the high level of investment in R&D and resulting high specialisation of production.

[I] CESA Annual Report, 2004-2005, p.15

[II] See for example: Maritime Economy. Statistic review, 2004, Maritime Institute, Gdansk 2004

[III] The Future of the Maritime Industry in Europe. The sea is the Future, EMF Executive Committee, 7-8th June 2005, Luxembourg, p.3

[IV] Ibidem, p.3

The following table below sets out the key strengths, weaknesses, opportunities and threats facing the European shipbuilding industry – and some of these are also discussed below in more detail.

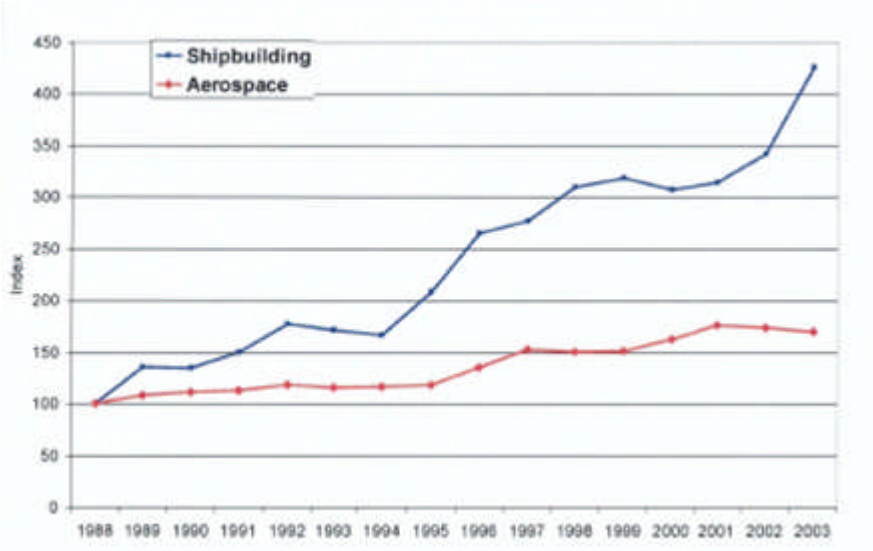
Figure 3.1 SWOT analysis

Strengths	Weaknesses	Opportunities	Threats
High RDI content	Lack of globally applicable trade rules	Increased seaborne trade and increased demand for ships	Unfair competition from Asian countries
High specialisation of production	Ageing workforce and difficulties with replacement	Increased demand for specialised vessels	Unattractive image of the industry
High labour productivity	Increasing skill and labour shortages	Innovations due to investment in R&D	Infringements of intellectual property rights
Skilled workforce	Incomplete filling of the shipyards' capacity	Expansion of short sea shipping	Low prices of ships due to global overcapacity
Strong shipbuilding tradition	Inability to compete on price		

Source: ECOTEC, 2006

Traditionally, the shipbuilding industry has been regarded as a labour intensive industry. However, over the last 20 years the situation has changed and now, with 36% less workforce, the industry has recorded 43% growth in output. Those figures suggest that the industry has become more capital intensive with more high technology and knowledge[I]. Labour productivity is high, as demonstrated by the figure 3.2 provided by CESA.

Figure 3.2 Labour productivity index (1998=100)

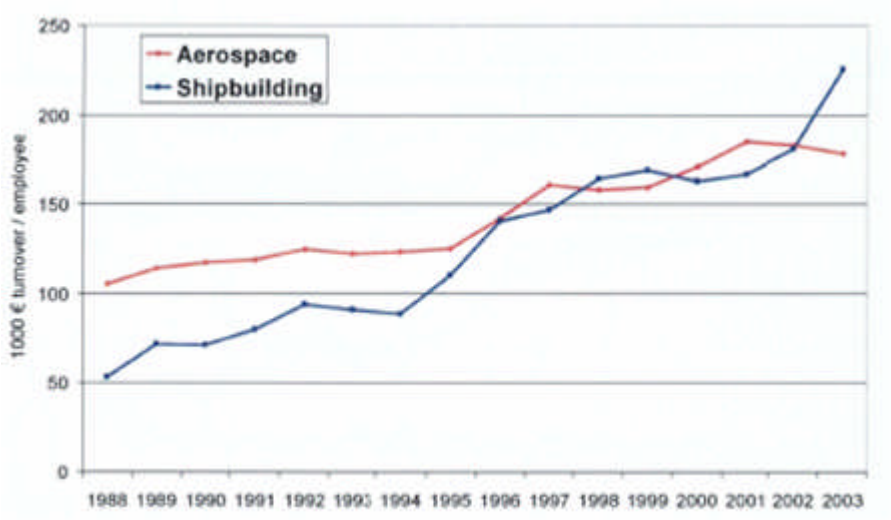


Source: CESA

[I] CESA Annual Report, 2004-2005, p.1

The increased productivity has resulted in increased turnover per employee, as shown in figure 3.3 below.

Figure 3.3 Turnover per employee



Source: CESA

The sector possesses a strong knowledge base, which contributes to high-tech production and specialisation. The sector also represents a very high content of research, development and innovation, which is reflected in 10% of the industry's turnover spent on RDI at European level. High RDI content and a high level of investment in RDI enable the industry to produce high quality and customised vessels. The industry also has a very strong position in the production and repair of specialised and complex vessels (64%)[I]. These include, for example, submarines with air-independent propulsion. European shipbuilders are also world leaders in terms of turnover, which reflects the high value of the ships produced. For example, almost all cruise ships are developed and built in European shipyards[II] or more precisely in four European shipyards in Italy, France, Germany and Finland. Together it is estimated that the cruise industry accounted for the employment of 26,910 individuals at these shipyards in 2004.

Europe is world leader in producing high tech vessels, both surface and submarine. Consequently, EU shipyards are no longer significantly active in the low cost market segments such as bulk carriers and tankers. These markets were taken over by Korean, Chinese and Japanese yards[III]. Asian yards have increasingly specialised in the production of "off the peg" large container vessels with a low level of R&D content. As one of the future threats facing the sector, it must be borne in mind that the current competitive

[I] AWES Annual Report
[II] Vision 2020, Waterborne Transport and Operations: A Key Asset for Europe's Development and Future, Waterborne TP, p.6
[III] COM(2003)232 final, p.5

advantage in producing high value added ships may change as the Asian competitors are also likely to develop this area of expertise.

3.2 Employment trends

The analysis of employment trends for the shipbuilding sector is somewhat complicated by the availability of different data sources which are sometimes inconsistent with one another. Gathering a full picture of employment is further complicated by the fact that the sector is characterised by increasingly high levels of outsourcing, thus leading to higher levels of employment in the marine equipment sector; the sector has moved towards greater specialisation requiring skills that are not necessarily held in-house.

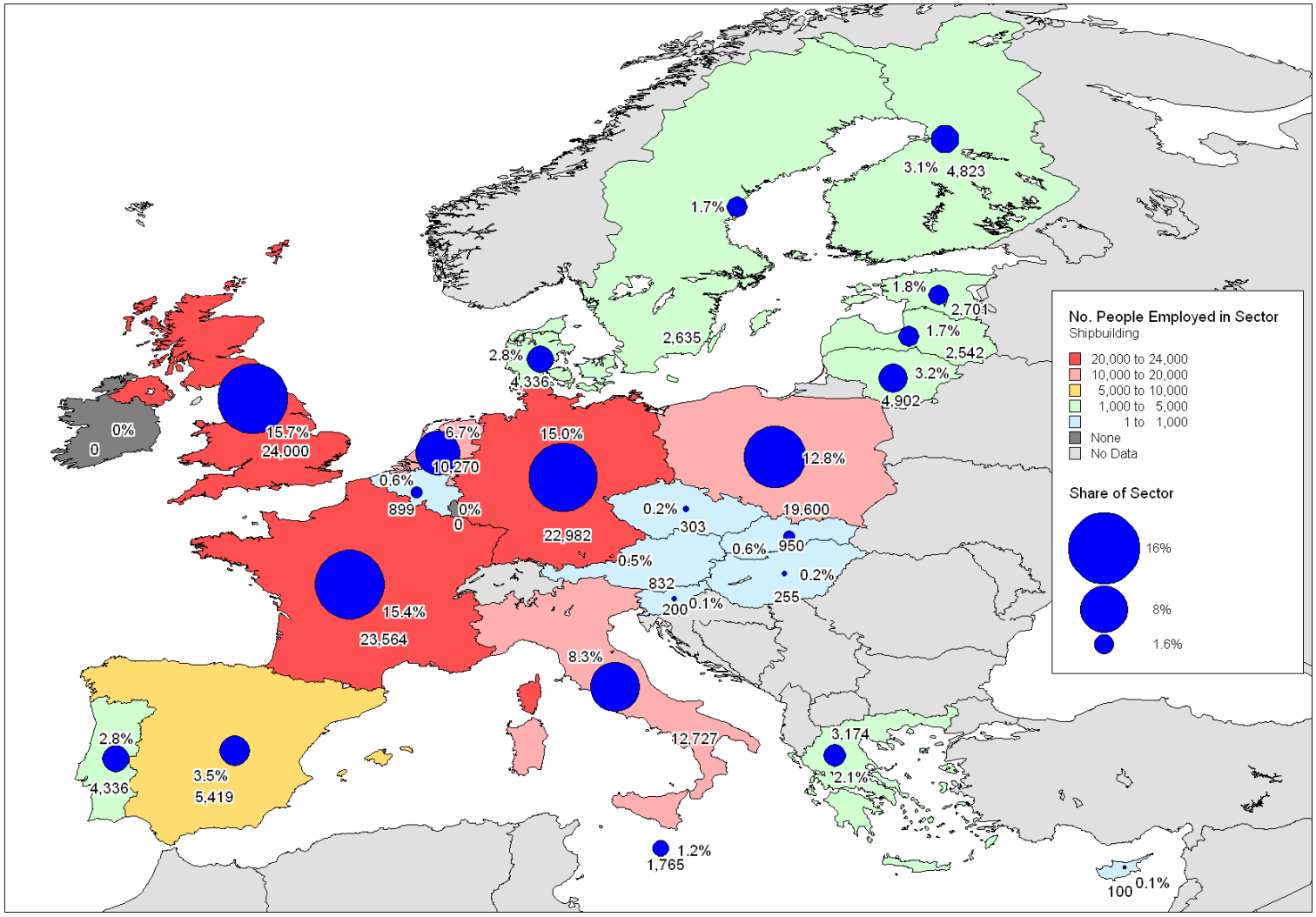
As a result, there are concerns over what really constitutes indirect employment in the shipbuilding sector and what is considered as employment in the marine equipment sector. In many EU Member States indirect employment in the shipbuilding sector is today regarded as employment in the marine equipment sector and only a fraction of countries have conducted detailed studies on indirect effects of the shipbuilding sector. Thus the focus of this report lies in assessing and analysing the current levels of direct employment and trends from the past decade.

According to the national studies (and complemented by CESA data) direct employment in the shipbuilding sector in Europe stood at 153,000 persons in 2004[l] (see table 4.2). The CESA member yards alone contributed to the creation of just under 85,000 jobs in the same year. The difference is partly explained by the fact that CESA members do not include military yards, and also by the fact that they do not currently represent shipyards from all the EU Member States (e.g. the Baltic States). Total figures also slightly differ from the findings of a study carried out by Tholen and Ludwig (2005) on European shipyard employment which concluded that European shipyards generated 127,489 jobs in 2004. This difference can largely be explained by the methodological differences in data from national stakeholders and the approach of the Tholen and Ludwig study.

Following the results of this study, as the following map shows the UK, Germany and France are the largest countries in the EU in terms of employment, with each representing 15-16% of total shipyard workforce. These three countries are closely followed by Poland, Italy and the Netherlands that make up 13%, 8% and 7 of total employment, respectively. Indeed, these six countries altogether gather 74% of the total shipyard workforce in Europe.

[l] Includes 2002 figure for the Netherlands and Sweden, 2005 figure for Lithuania, 2003 figure for Belgium, Italy and Portugal.

Map 3.1 Employments in the shipbuilding industry in EU-25, 2004[I]

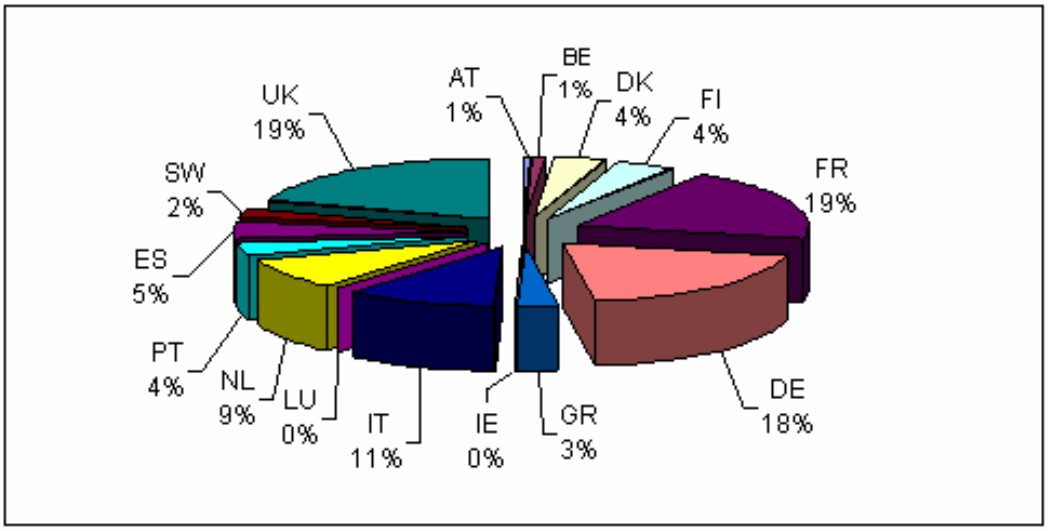


Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

The UK and France are home to 19% of the total workforce in the old-15 Member States, followed by Germany (18%), Italy (11%) and the Netherlands (9%). Countries like Spain, Portugal, Denmark and Finland each have a 4-5% market share of total employment in the EU-15.

[I] Figures for Austria and Czech Republic are based on a small LFS sample and therefore should be regarded as indicative of employment in this sector. Furthermore, the figures for these countries also include employment related to manufacturing of recreational and river navigation vessels. Please note that figures for Spain vary from source to source; Gernaval has reported employment to stand at 5,419 whilst University Bremen study on shipbuilding industry employment declares this figure to be 10,850 in 2005. This difference is likely to be caused by the restructuring of IZAR group.

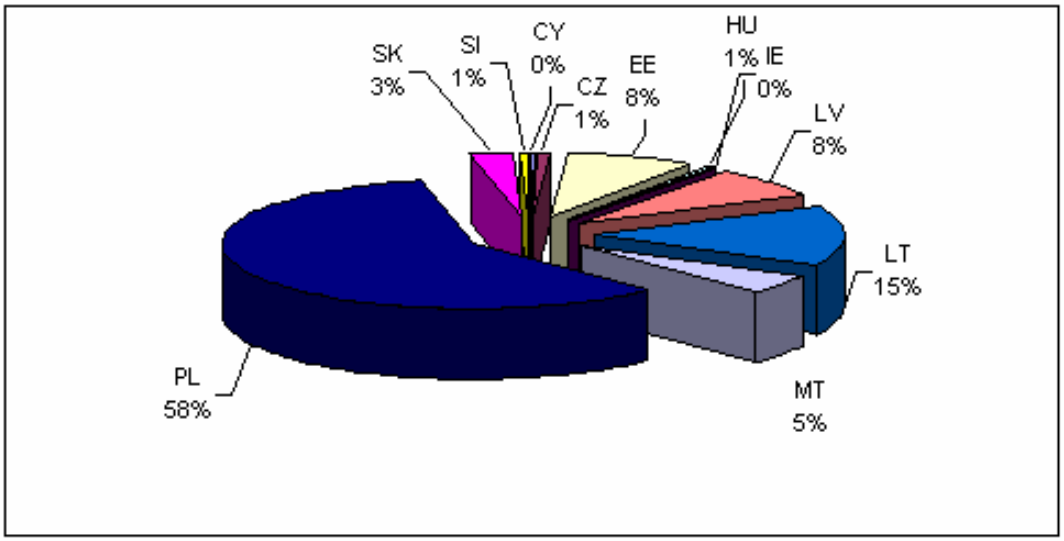
Figure 3.4 Share (%) of employment in the EU-15, 2004



Source: ECOTEC Research & Consulting, 2006

The Polish shipyard workforce forms 58% of the total workforce in the 'new' Member States, with Lithuania being the second largest employer in this sector. Lithuanian shipyard workers (4,902) make up nearly a fifth of total employment in the EU-10. These countries are followed by the two other Baltic States of Estonia (8%) and Latvia (8%), and Malta, which despite of its small overall population comprises 5% of all shipbuilding industry workers in the 'new' Member States.

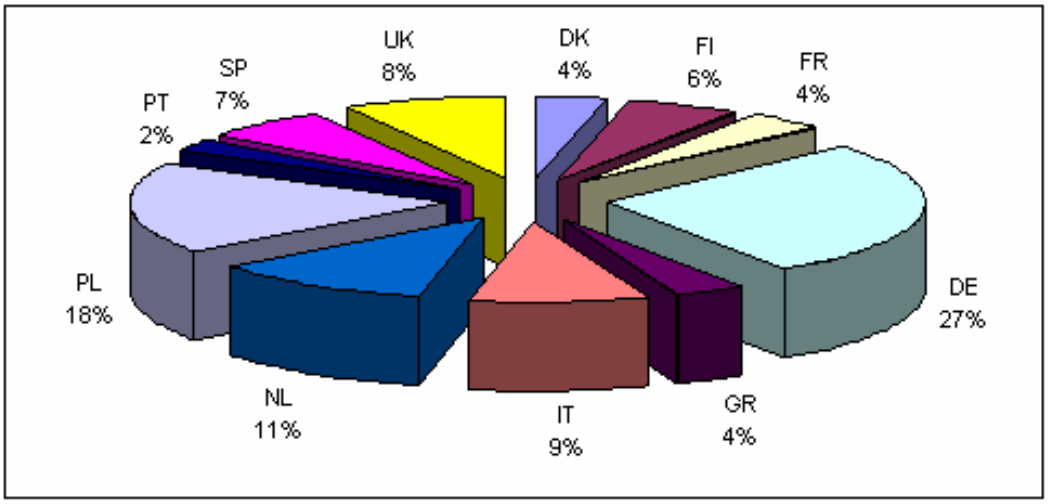
Figure 3.5 Share of employment in the EU-10, 2004



Source: ECOTEC Research & Consulting, 2006

If we look at the share of employment in CESA member yards, the graph below shows that Germany is home to over a quarter of employment (27%) – followed by Poland (78%) and the Netherlands (11%).

Figure 3.6 Share of employment in CESA member yards, 2004



Source: CESA, 2006

The vast majority of countries demonstrate a downward trend in employment. Some of the strongest levels of decline have taken place in Denmark (57%), followed by Malta (51.3%) and Spain (45%). The overall trend in Italy and Estonia is upward. Sweden witnessed an increase of 4.3% in employment in ship repair during the period from 1997 to 2002, however has more recently seen a closure of its last shipyard.

Table 3.1 Direct employment in the shipbuilding sector in Europe 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
AT	-	-	-	-	-	-	754	878	919	832	325
BE	-	-	-	-	-	-	913	892	899	-	-
CY	80	-	-	-	58	100	100	100	100	100	100
CZ	-	-	-	-	-	-	809	1,132	496	303	501
DK	12,495	11,360	10,763	9,435	7,890	6,810	6,653	6,524	-	-	-
EE	-	-	-	-	-	2,604	2,158	2,616	2,581	2,701	-
FI	6,932	5,882	5,066	5,100	5,600	5,769	6,041	5,998	5,380	4,823	-
FR	-	-	29,684	26,036	25,512	-	23,564	-	-	-	-
DE	-	-	-	-	-	25,939	-	24,329	23,807	22,982	-
GR	5,582	4,251	3,615	3,600	3,380	3,280	3,000	3,000	2,350	3,174	-
HU	-	-	-	-	-	-	-	-	-	255	-
IE	-	-	-	-	-	-	-	-	-	-	0
IT	10,213	10,500	10,762	11,244	11,845	12,957	14,042	13,438	12,727	12,033[I]	-
LV	-	-	3,394	3,522	3,062	2,736	2,712	2,543	2,539	2,542	-
LT	-	-	-	-	-	-	-	-	-	-	4,902

[I] Different data source to the others.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
LU	-	-	-	-	-	-	-	-	-	-	0
MT	4,510	4,237	4,083	3,928	3,755	3,628	3,485	2,678	1,757	1,765	1,763
NL	-	-	10,740	-	-	-	-	10,270	-	-	-
PL	31,894	30,316	26,767	26,874	28,800	-	-	20,132	19,180	19,600	18,700
PT	-	9,984	5,626	6,270	6,195	4,550	4,739	5,193	4,336	-	-
SK	-	-	-	5,500	-	-	-	-	-	950	-
SI	-	-	-	-	-	-	-	-	-	200	-
ES	9,807	-	8,675	7,602	6,967	6,668	6,459	6,232	5,861	5,419	-
SW	-	-	2,527	2,617	2,525	2,689	2,627	2,635	-	-	-
UK	-	-	-	35,000	-	-	-	-	-	24,000	-

Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

The downward trend in Spain was stronger in the period from 1995 to 1999 at the level of -28.9% than in the period from 2000 to 2004 at the level of -18.7%. CESA data indicate the reverse, with 27.1% decrease between 1995 and 1999, and 32.2% decrease between 2000 and 2004. In Latvia, the sharpest decline in employment took place between 1997 and 2000 (-19.4%) as compared to the period 2000-2004 (-7%). This may partly have taken place as a result of the reductions in the Tosmare Yard in 1998. In the Netherlands, the decline has been marginal (-4.3%).

If we have a look at the CESA data more closely (see table 3.2) it is possible to see that its member yards employed just under 142,000 persons in 1995. The workforce fell to just 85,000 employees over a ten-year period, 1995-2004. This represents a decline of 40%. The most dramatic decline took place between 1995 and 1996, and the only year witnessing an overall increase was the year 2000 (the year before the end of subsidies).

Table 3.2 Workforce in the shipbuilding sector in CESA member yards (EU countries only)

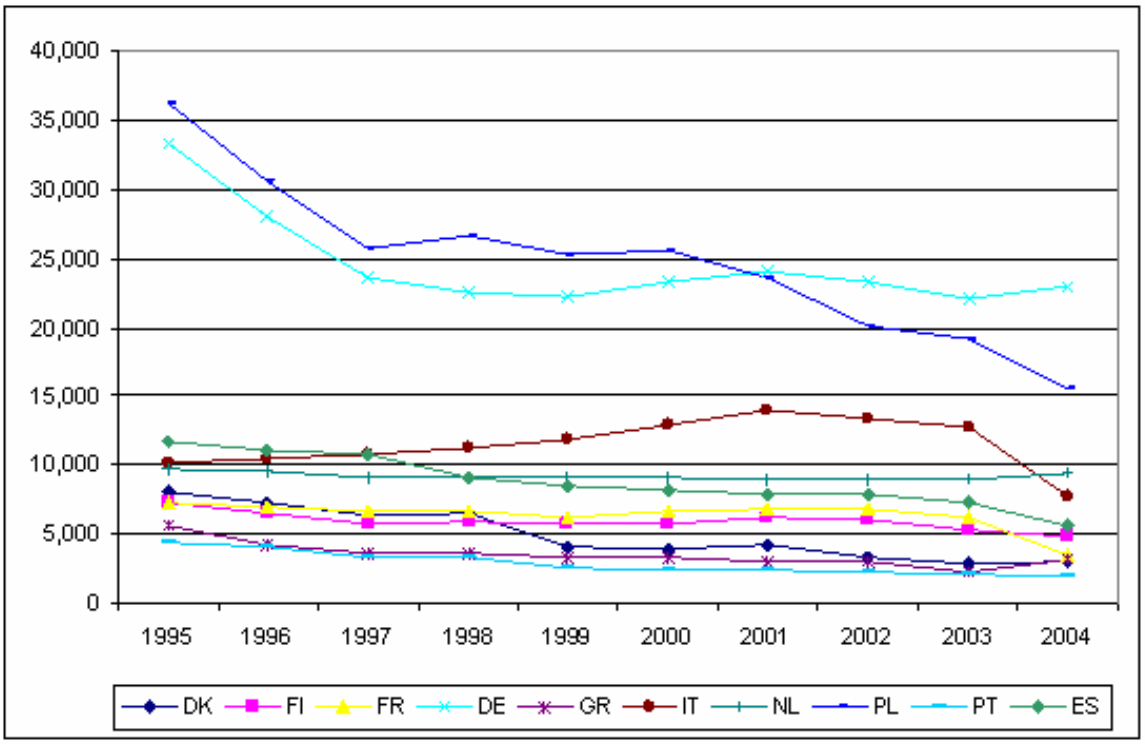
	1975	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Change from 1995
BE	*10,245*	300	-	-	-	-	-	-	-	-	-	
DK	*18,900*	8,120	7,300	6,350	6,500	4,080	3,970	4,320	3,360	2,900	3,100	-61.8%
FI	*18,000*	7,321	6,536	5,780	5,897	5,800	5,800	6,200	6,150	5,380	4,800	-34.4%
FR	*40,354*	7,300	7,000	6,700	6,650	6,250	6,700	6,800	6,800	6,250	3,500	-52.1%
DE	*105,988*	33,350	28,000	23,500	22,500	22,200	23,300	24,000	23,300	22,000	22,982	-31.1%
GR	*10,159*	5,582	4,251	3,615	3,600	3,380	3,280	3,000	3,000	2,350	3,174	-43.1%
IE	*1,633*	-	-	-	-	-	-	-	-	-	-	-
IT	*36,260*	10,213	10,500	10,762	11,244	11,845	12,957	14,042	13,438	12,727	7,765	-24.0%
NL	*39,850*	9,800	9,600	9,100	9,100	9,100	9,100	9,000	9,000	9,000	9,500	-3.1%
PL	-	36,216	30,577	25,633	26,686	25,223	25,600	23,500	20,132	19,180	15,500	-57.2%
PT	*17,100*	4,415	4,171	3,418	3,328	2,530	2,430	2,400	2,350	2,184	1,981	-55.1%

	1975	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Change from 1995
SP	*47,000*	11,692	11,051	10,765	9,150	8,519	8,209	7,983	7,876	7,343	5,562	-52.4%
SW	*31,500*	1,152	1,277	883	-	-	-	-	-	0	0	-
UK	*55,999*	6,500	8,500	8,500	8,500	8,750	8,000	7,000	7,000	7,000	7,000	+7.7%
Total	***432,988***	**141,961**	**128,763**	**115,006**	**113,155**	**107,677**	**109,346**	**108,245**	**102,406**	**96,314**	**84,864**	**-40.2%**

Source: CESA Annual Report 2004-2005

The highest declines were experienced by the CESA yards in Denmark (67%), Greece (43%), Poland (57%) and Portugal (55%). The smallest decrease was recorded by the Netherlands at 3%.

Figure 3.7 Employment trends in the CESA shipyards, 1995-2004



Source: CESA

The largest decline in the industry's workforce occurred between 1995/1996 and 1996/1997, with a 9.3% and 10.7% decline respectively. Another major reduction took place between 2001/2002 and 2002/2003, with a 5.4% and 5.9% decline respectively. The latter reduction can partly be explained by the slowdown in orders for new ships after the end of public subsidies in the EU countries (in many countries employment had peaked in 2000 or 2001).

In the new build category (that includes new merchant and offshore vessels) the overall CESA workforce decreased in the period from 1995 to 2003 by 25.5% with 83,885 employees in 1995 to 62,495 in 2003 (see below). These figures also show more extreme

differences between countries in terms of employment levels. The largest decreases occurred in Denmark (67.4%), Germany (38.9%), Spain (37.7%) and UK (37.5). Portugal, on the other hand increased its workforce by 24.5% and Italy by 8.25%.

Table 3.3 Employment in newbuildings – CESA yards

COUNTRY	*1975*	1995	1996	1997	1998	1999	2000	2001	2002	2003	Change from 1995
BELGIUM*	*6,586*	150	-	-	-	-	-	-	-	-	
DENMARK	*15,300*	7,360	6,500	5,600	5,850	3,150	3,330	3,680	2,820	2,400	-67.4%
FINLAND	*17,000*	6,932	5,882	5,066	5,100	5,600	5,600	6,000	6,000	5,250	-24.3%
FRANCE	*24,938*	5,100	5,000	5,350	5,200	4,650	5,300	5,250	5,200	4,350	-14.7%
GERMANY	*71,598*	23,250	20,200	17,100	16,200	16,200	17,500	18,300	16,800	14,200	-39%
GREECE	*2,316*	-	-	-	-	-	325	750	750	250	-
IRELAND	*1,427*	-	-	-	-	-	-	-	-	-	-
ITALY	*21,460*	8,509	9,160	9,832	10,248	9,877	10,121	9,734	9,606	9,211	8.2%
NETHERLANDS	*20,850*	4,200	4,200	4,600	4,200	4,200	4,200	3,800	3,800	3,800	-9.5%
POLAND	-	13,760	15,988	18,322	18,294	17,270	20,100	19,000	15,073	13,415	-2.5%
PORTUGAL	*7,000*	1,010	1,111	1,178	1,398	1,200	1,200	1,200	1,284	1,258	24.5%
SPAIN	*27,800*	9,411	8,853	8,759	7,409	6,836	6,563	6,395	6,234	5,861	-37.7%
SWEDEN	*25,000*	203	177	510	-	-	-	-	-	-	-
UNITED KINGDOM	*48,272*	4,000	4,000	4,000	3,500	3,750	3,000	2,500	2,500	2,500	-37.5%
TOTAL	***289,547***	**83,885**	**81,071**	**80,317**	**77,399**	**72,733**	**77,239**	**76,609**	**70,067**	**62,495**	**-25.5%**

Source: CESA

In the ship repair category (see table 3.4), the overall decline amounted to 41.7% with the greatest reductions recorded by Poland (74.3%), Portugal (72.8%) and Finland (66.6%). The smallest decline was once again recorded by the Netherlands (7.1%).

Table 3.4 Employment in ship repair – CESA yards

COUNTRY	1995	1996	1997	1998	1999	2000	2001	2002	2003
BELGIUM*	150	0	0	0	0	0	0	0	0
DENMARK	760	800	750	650	930	640	640	540	500
FINLAND	389	654	714	797	200	200	200	150	130
FRANCE	2,200	2,000	1,350	1,450	1,600	1,400	1,550	1,600	1,900
GERMANY	10,100	7,800	6,400	6,300	6,000	5,800	5,700	6,500	7,800
GREECE	-	-	-	-	-	2,955	2,250	2,250	2,100
IRELAND	0	0	0	0	0	0	0	0	0
ITALY	1,704	1,340	930	996	1,968	2,836	4,308	3,832	3,516
NETHERLANDS	5,600	5,400	4,500	4,900	4,900	4,900	5,200	5,200	5,200
POLAND	22,456	14,589	7,311	8,392	7,953	5,500	4,500	5,059	5,765

COUNTRY	1995	1996	1997	1998	1999	2000	2001	2002	2003
PORTUGAL	3,405	3,060	2,240	1,930	1,330	1,230	1,200	1,066	926
SPAIN	2,281	2,198	2,006	1,741	1,683	1,646	1,588	1,642	1,482
SWEDEN	949	1,100	373	0	0	0	0	0	0
UNITED KINGDOM	2,500	4,500	4,500	5,000	5,000	5,000	4,500	4,500	4,500
TOTAL	58,076	47,692	34,689	35,756	34,944	32,107	31,636	32,339	33,819

Source: CESA

According to the Eurostat Labour Force Survey data available for the category of 'Building and repairing boats and ships', employment in this sector reached 229,504 persons in 2004 and 258,238 in 2005[I]. The major difference between the data from CESA and Eurostat is that the LFS data includes building and repairing of recreational boats, which are treated separately in this study. Also, it is likely that these data also include indirect employment in the shipbuilding sector and employment of people in the marine equipment sector (which is also treated separately in this report).

The main difference between national and industry level data and Eurostat data is the difference in overall trends. While the industry and national sources indicate a strong decline of the number of individuals employed in the sector, Eurostat data in many cases indicate growth. For example, the German workforce has increased by 20% during the period analysed. According to CESA data, the change during that period was -4.2%. One of the sharpest declines in workforce numbers is recorded in France (over 40%), which again corresponds neither to national nor to CESA data that showed the decrease of approximately 14%. A similar situation occurs in the case of Spain, which clearly demonstrates a downward trend both according to CESA (-37.2%) and national data (-44.7%), whereas Eurostat data indicate an increase in the workforce of over 10%.

3.3 Factors affecting employment

When looking at employment trends in the sector, it is important to bear in mind a number of key developments, which have affected employment in different ways. The sector has suffered great employment losses following the phasing out of subsidies and this situation has been further aggravated by the undisputable existence of the illegal subsidies elsewhere in the world which, in many cases, has forced the European shipbuilders to reduce costs.

Another important trend is outsourcing, where functions previously carried out by the shipyards directly are now being subcontracted to external suppliers as a means of

[I] Data includes Austria, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden

rationalising operations. This resulted is the reduction of direct employment in the shipyards over the recent years[I]. This trend is also impacting on skill needs and demand for future labour as partnering and liaison with other companies in the maritime supply chain highlights the necessity for communication and project management skills, as well as the loss of traditional skills to the sector.

The European shipbuilding sector has also been modernised and restructured. However, in the new Member States in Central and Eastern Europe, this trend has been even more pronounced than in the old EU. Restructuring did not only involve privatisation but also changes in production methods, such as increased input of RDI, use of subcontractors, etc. Restructuring processes also involved a different focus for the whole shipbuilding industry. In case of Poland, the restructuring of the sector, including modernisation and privatisation, has resulted in the increasing productivity of the sector and, consequently, reduction in staff numbers. At present, the productivity of Polish shipbuilding workers is still lower that that of their EU counterparts. However, it is believed that further reductions of staff numbers may at least partly be compensated by the increase of orders in shipyards.

Before 1991, most of the shipyard production in the Baltic States and Poland was driven by the demand from the former USSR under COMECON. The demand not only included orders for ships but also cheaper supply of raw materials and different legal and financial guarantees for the sector to function. The example of Latvia can illustrate this process, where most of the shipyards were focused on naval construction and repair. After the fall of the Soviet Union, the customer base has expanded and the focus has shifted towards merchant vessels. In Spain, the restructuring of IZAR resulted in reductions in employment of approximately 4,000 workers.

Another important trend that has exerted enormous influence on the sector's workforce is ageing. This has been reported to be an issue of particular concern for example in the Netherlands, the UK and Finland. Many highly skilled engineers in particular will retire in the near future and at the same time it is difficult to replace them with younger workers. Since the industry is sensitive to economic fluctuation and is contract-related, these cycles have an impact on employment. This insecurity translates into a greater tendency to accept early retirement, as well as contributing to the poor image of the sector among potential new recruits.[II]

As most of the European workforce is ageing, the industry faces a challenge not only to retain the existing workforce but also to attract a new one. However, the industry lacks an

[I] Ibidem, p.4

[II] Haltia P., Himberg H., Touminen T., *Learning by shipbuilding: practices, and obstacles for younger and older employees?*, University of Turku, Finland, p.1

appealing image, which is reflected i.e. by the decreasing number of young graduates in the fields relevant to the shipbuilding. Finally, the shift of focus of production from more labour-intensive into technology-intensive and more project-oriented production has impacted employment. Shipbuilding has always been a cyclical industry, and with the recent speeding up of delivery and product cycles, labour force planning and indeed employment forecasting has become even more difficult and might well be subject to stronger variations over time.

The perception of the sector has therefore suffered as a result of a variety of factors including outdated perceptions of heavy manual work, the image of an industry in decline as a result of past layoffs and strong ongoing cyclical influences. In order to boost recruitment, work not only needs to be done to "update" the image of the sector as an innovative one with high technology content, but innovative solutions also have to be found to emphasise and ensure security of employment rather than job security and flexible work organisation (a so-called flexicurity strategy). Some work in this area has already been accomplished by social partners, indicating that an exchange of good practice at the European level would be beneficial to share experiences.

3.4 Employment forecast

As earlier mentioned, by taking together civil and naval shipbuilding, repair and conversion as well as its suppliers, this sector constitutes the third largest growth market in the global maritime cluster between 2005 and 2010, according to a 2005 study by Douglas Westwood[l]. However, for the reasons outlined about, this trend was largely not reflected in direct employment figures in the sector. Positive forecasts also have to be seen against the background of significant overcapacity in the sector in world markets.

Bringing the issue of trade distortions in shipbuilding through Korean subsidies to the WTO has given a mixed result. In the Community's case against Korea, the Panel found that the Korean Export/Import Bank had indeed, in numerous individual cases, provided prohibited export-contingent subsidies to Korean shipyards. The Panel gave however the Korean Government the benefit of the doubt, despite a wealth of circumstantial evidence. Therefore it has been argued that the available WTO instruments are not well suited for this industry. It is therefore likely that the market for very large standard vessels (particularly container ships and oil tankers) will continue to shift to Asia, with European shipyards forced to compete in R&D and therefore investment intensive areas and the building of specialised vessels. At the end of 2004, there were outstanding orders on the books for 2,410 vessels. Just over a third of new orders for new ships were placed with

[l] Douglas Westwood for University of Kiel; World Marine Markets, 2005

shipyards in South Korea. Japan provided the largest demand for new vessels (20%), followed by Germany (12%) and Denmark (8%).

The year 2004 was a boom year for international shipping, which was reflected in a significant number of new orders. This was buoyed by overall economic growth, mainly driven by developments in the USA and China. On the other hand CESA's analysis of future requirements in worldwide shipbuilding capacity together with the OECD's assessment of an annual demand for new built vessels, lead to the assumption that for the foreseeable future, shipbuilding capacity will outstrip demand by approximately 30%, leading to a further wave of global competition, potentially resulting in a paradoxical situation in which there is a high demand for ships but the prices are decreasing. This could have a detrimental impact on employment in European shipyards[I].

The opportunities provided by the growth in maritime transport and seaborne trade are indicated by most of the European countries. Another opportunity for development in the sector might be the increasing willingness to transfer some of the road freight to short-sea shipping, which could result in the increase in orders for smaller vessels[II].

Following the downturn of during the early years of this decade, which demonstrated – on the one hand – the cyclical nature of the industry (as a result of the ageing of vessels), but was also to some extent due to expiry of existing state subsidy regimes in the European Union which led a significant number of orders to be placed in 1999/2000, shipyards have been able to double the size of their order books in 2004. This trend continued in 2005 and ensures healthy production over the next three years[III]. European trends in this respect reflect a global increase in demand for new vessels, particularly as a result of the increased use of ocean and short sea shipping for the movement of cargo.

To conclude, the employment forecast should be considered to be a positive one over the coming years (up to 2008) as order books are strong and orders often take several years to complete. The specialised, high quality vessels built in Europe are strongly linked to strong economic cycles and public investment, therefore global market cycles do play an important role. The forecasts are also positive for repair yards, which had benefited from the high freight rates in 2004 and 2005.

[I] See for example: Maritime Economy. Statistic review, 2004, Maritime Institute, Gdansk 2004
[II] Marine industries. Global market analysis, Douglas-Westwood Ltd for Marine Institute, Ireland, in: Marine Foresight Series, No 1, March 2005, p.110
[III] CESA Annual Report, 2004-2005, p.5

3.5 Skill needs and labour availability

In relation to training and skills, reference must be made to a number of key trends affecting the sector; namely skill shortages; attractiveness of the sector; changes in skills profiles and related to this the availability and quality of training provision specific to the sector.

A study carried out by Tholen and Ludwig (2006) indicates that many shipyards in Europe are experiencing skills gaps as well as labour shortages. However, although approximately 55% of the EU-15 yards are affected by these difficulties, only 35% perceive them to be a problem[I]. The greatest difficulties are found in merchant shipbuilding, where which 43% of the employers reported difficulties in recruiting blue collar workers. Restructuring in the sector and technological advances have led to an ongoing training demand in new technologies and innovations for engineers as well as there is an increasing demand for IT skills, for example in relation computer assisted design and technology. The trend towards subcontracting and the focus on specialised, one-off designs has increased requirements for contract management, legal, logistics and marketing experts. Sectoral experts have also highlighted shortages in communication and project management skills, which are increasingly in demand following the increase in outsourcing and necessity to liase with other companies in the supply chain. Furthermore, due to the trend in the sector towards greater specialisation, there is a need to train more specialised staff in order to win contracts for specialised vessels.

As already mentioned, the industry is also facing a labour shortage that is influenced by an ageing workforce and the reputation of the industry. The latter suffered greatly during 2003 and 2004 when large scale redundancies were made. Furthermore, young people do not see the sector as an attractive one although wages are often higher than the national average. In the UK, the remedy for the skill and labour shortages is believed to be the increasing uptake of apprenticeships, as there will be an increasing amount of work related to new contracts[II].

Employers and employee representatives have also played an important role in efforts to raise the profile and increase understanding of employment profiles and opportunities in today's shipyards - in the context of European Social Dialogue Committee on Shipbuilding. CESA and the European Metalworkers' Federation (EMF) run the European Shipyards Week in 20006 and produced material which underlined the innovation and high

[I] University of Bremen study, 2006 p.30

[II] *Managing cyclical changes in the European shipbuilding and ship repairing industries: Evidence from the United Kingdom,* Draft research by Labour Research Department

technology content of work in the sector, which no longer fits the image of the past of heavy manual labour.

Differences exist from country to country regarding the levels of qualifications and skill sets for which employers find it most difficult to recruit. For example:

- In Germany, 42% of the yard owners report difficulties in recruiting white collar workers while just over 21% report difficulties in recruiting blue collar workers[I].
- Companies in the UK report that the most likely labour shortages in the next five years will be for metal workers, pipe workers and electrical engineers[II]. In order to fill the vacancies the companies are increasing salaries, retraining workers and subcontracting.
- In Estonia, workforce shortages are considered to be the most serious challenge experienced by the sector. At present, greatest unfulfilled demand exists for welders. The sector is in competition with other sectors of the economy (such as construction) for such skilled staff.
- In the Netherlands, the shipbuilding sector accounts for 2% of vacancies as compared to the total labour force, which is close to the country's average. However, 58% of these vacancies are hard to fill. Most openings regard positions in manufacturing. Especially metalworkers (30% of all vacancies) and pipe workers (15%) are needed. According to the employers many candidates do not have enough work experience or are insufficiently specialised/educated.

In general, recruitment difficulties are more significant for highly skilled workers than for workers with lower level qualifications. This is partly due to the changed nature of the sector, but also results from the fact that in many countries shipyards are located in areas otherwise facing labour market difficulties due to high unemployment, thus increasing the pool of labour of lower skilled staff.

Skill shortages as well as labour shortages raise doubts as to the capacity of the European shipbuilding industry to effectively compete and to take advantage of the increased demand for new ships. This can be illustrated by the example of Poland, whose forward order books are filled; however, it is unsure whether there will be sufficient amount of properly skilled workers. In the UK, the amount of new work related to the new contracts is likely to pose problems regarding the recruitment and retaining of skilled workforce. The lack of capable and skilled staff has also been blamed for the loss of some contract work in the UK[III].

[I] Bremen study, Tholen. Ludwig
[II] Marine Labour Market Observatory, EMTA
[III] Marine Labour Market Observatory, EMTA

The skill shortages become even more serious when specific training programmes and not or no longer available. In Sweden, for some of the occupations needed in the sector, such as shipbuilders and welders, there are currently no appropriate educational programmes and thus shipyards in Sweden have been forced to hire staff from other countries such as Denmark and Poland. Previously when Swedish shipbuilding was still a world leading producer of ships, each of the shipyards had their own apprenticeship programmes in which they could make sure that the apprentices developed the skills required.

Skill shortages in the sector are also attributed by many to the cyclical and contract driven nature of the work, which is seen to provide insufficient job security[I]. The contract driven nature of work is especially felt by the repair industry, which heavily relies on short-term contracts, subcontractors and temporary labour. However, due to the decreasing and ageing workforce, there is a great risk that the skill will not be readily available. Moreover, as highlighted by many, outsourcing and subcontracting, which used to be the method of easing the lay-off and redundancy schemes, has in many cases led to the loss of many skills due to the small size of the enterprises-subcontractors and their short-term existence[II].

Due to the skill and workforce shortages some companies have been forced to rely on workers from other countries. This is the case of Sweden or Denmark, which recruit highly qualified workers from elsewhere in the EU or EEA, such as Norway, Poland and Portugal. While workforce migration is not in itself a negative phenomenon, in some countries the outflow of qualified workforce may negatively influence the development of the domestic sector. Labour migration to other EU countries has indeed become an enormous problem for Latvia whose yards are now struggling to find auxiliary workers, such as welders rack installation workers, pipers and operators. In Finland, the profile of the workforce has traditionally been fairly homogeneous with a great majority of workers coming from Finland. Recent years have, however, witnessed a trend of growing number of workers from Estonia, Lithuania and Russia.

[I] Haltia P., Himberg H., Touminen T., *Learning by shipbuilding: practices, and obstacles for younger and older employees?*, University of Turku, Finland, p.1

[II] Granger N., Maintenance and Development of the Skills Base for Shipyards, in: in: Qualification and Training Forum, European Shipbuilding Social Dialogue Committee, 21 October 2005, Trieste, p.26

4.0 Marine equipment

The marine equipment industry consists of companies that produce equipment and materials for shipbuilding, oil & gas installations, ports and other core maritime sectors. Most often this means items purchased for the shipbuilding process, such as propulsion systems and other machinery, IT solutions, electronic control systems and bridge systems. Indeed, the sector supports the whole marine value chain and stakeholders. The difficulties relating to the definition of the marine equipment sector are caused by the nature of the activities of the companies in the sector – as companies in the sector produce increasingly specialised and often new products and they are usually active in several different fields, e.g. aviation, furniture or car manufacturing.

The definition which is used by the European Marine Equipment Council (EMEC) describes marine equipment market as all products and services supplied for the building, conversion and maintenance of ships (seagoing and inland). This includes technical services in the field of engineering, installation and commissioning, and ship maintenance (including repair).

4.1 Economic impact

Some 30 years ago most of the shipbuilding work was carried out by the shipyards. With the growing trend of specialisation, the work has increasingly been subcontracted to external suppliers. At present, an average shipyard subcontracts 50-70% of their work, which means that most of the added value comes from the subcontractors.

The marine equipment market was estimated at €73 billion in 2004, whilst shipbuilding accounted for €21.3bn[I]. Europe is a major provider of marine equipment and its market was valued at €26bn in 2004, with €12bn related to the export market. The export share is nearly 46%.

In 2000 Europe was estimated to satisfy 37% of the world demand for marine equipment, while having 16% of the world shipbuilding market share. European equipment industries are world leaders in propulsion, cargo handling, communication, automation and environmental systems[II]. Significantly, the vast majority of marine equipment and services used for cruise ships is sourced from Europe[III]. The leading country in the European

[I] Ibidem, p.111
[II] EMEC
[III] For example, at the family controlled Meyer Werft in Germany a recently completed ship's prefabricated cabins were made in Germany, the wall panels in Norway, carpets in Denmark, galleys in Finland, and other products were

marine equipment sector is Germany with 15% of the world market share. Other important players in the sector are the UK, Austria, Netherlands, France and Italy.

Since the marine equipment is heavily dependent on the shipbuilding sector, this sector tends to be small in countries with limited shipbuilding activity, such as Belgium or Ireland. However exceptions to the rule also exist. As an example, the sector employs estimated 7,000 individuals in Austria. Employment trends also tend to follow the ones of shipbuilding industry, for example in the case of Denmark where the sector has witnessed a downturn after the crisis in shipbuilding the sector – even if this decline has been more moderate than in the shipbuilding sector. Furthermore, the countries which are the biggest players in the marine equipment sector increasingly focus their attention on exports.

Some countries, such as Italy and France, have extensive local manufacturing capability. In France, for example, between one-third and a half of equipment is supplied by French manufacturers[l]. Another important player in the marine equipment sector in the EEA is Norway, which in 1997 accounted for 14% of the world market share.

The most important strengths of the European marine equipment market are strong innovation which results in specialised solutions for special problems. The European ship systems and equipment are highly sought after on the world market. The weaknesses of the European marine equipment sector are that it is expensive and at present both euro and sterling are overvalued, which in turn damage the European exporters in this field. Moreover, the companies do not sufficiently cooperate with universities and the latter are not sufficiently market-oriented. This results in problems in turning innovation into a product.

The opportunities for the sector include growing global demand for new ships, in particular specialised vessels and cruise ships. The growth sectors are gas shipping and LNG carriers, together with gas treatment technology. Another strong market segments seem to be the environmental technology, security-related solutions, such as better monitoring and onboard security. Key threats for the sector include:

- cyclical nature of the shipbuilding industry, which has an impact on the marine equipment sector;
- increased competition from Asia, which is often unfair due to subsidies; and
- unfavourable dollar/euro exchange rate.

manufactured in France and Italy. The turnkey outfitting in public areas was completed by a variety of German companies. See: The ECC Annual Review Book (2006) The ECC

[l] The ECC Annual Review Book (2006) The ECC

4.2 Availability of employment data

The previous section has already dealt with some of the issues relating to problems in calculating employment in the maritime equipment sector. The sector is not recognised as its own sector by national or European statistics and difficulties arise from that fact that most companies are active also in other manufacturing sectors, hence only a part of their employment is directly linked to the wider maritime sector. In addition, company level data is often difficult to obtain due to the employment data being commercially sensitive. And in some countries, such as Italy, the marine equipment production is practically integrated in the shipyards which make it difficult to draw an exact line between the two sectors.

It is worth mentioning that no studies have been done at European level to look at employment in this sector in detail. Furthermore, only a few studies have been carried out at national level (DK, NL and FI). This is partly because this definition of the sector itself is seen as fairly new, and traditionally, although this perception is changing, the sector has seen as an indirect employment effect of the shipbuilding industry. The sector is receiving a growing recognition of an industry of its own as it is becoming increasingly important in economic and employment terms. For example, in Spain employment in the maritime equipment sector is approximately seven-fold compared to jobs in shipyards.

Employment data for this study has been obtained from a variety of sources. The Spanish stakeholders viewed that largely speaking the difference between employment data provided by the representative organisation for the shipbuilding industry and total employment in the 'building and repairing ships and vessels' sector (LFS) can be considered as employment in the maritime equipment sector. Many countries rely on overall estimates on employment in this industry (e.g. Poland) and in many countries the national experts were not even able to provide estimates (e.g. Lithuania).

In Denmark the Danish maritime cluster study could not specify exactly which proportion of the activities of companies that manufacture marine engines and compressors are linked to the maritime sector, rather than other sectors. Furthermore, it could not guarantee that all specialist suppliers would be covered in the study. For instance, the suppliers of radio and communication equipment were not included in the study. The Dutch and Finnish maritime cluster studies solved this problem by carrying out a large-scale survey among contractors and sub-contractors for the shipyards. The Finnish study found that the turnover of and employment in these companies was substantially higher than that of shipyards, but only just under a third of the turnover and a quarter of total employment was generated by the maritime sector.

4.3 Employment trends

The marine equipment sector provided approximately 287,000 jobs in 2004/5[LXIII] (estimations vary between 272,000-302,000). This is somewhat higher than the figure from 1997 that estimated that the direct employment in the sector amounted to 262,000 while indirect employment accounted for further 436,000 jobs[LXIV].

Table 4.1 Direct employment in the marine equipment sector

	1997	1998	1999	2000	2001	2002	2003	2004	2005
AT	-	-	-	-	-	-	-	-	7,000*
BE	613	-	808	770	-	-	-	-	-
DK	20,326	20,202	21,811	21,336	21,427	20,626	-	-	-
EE	-	-	-	-	-	-	-	-	1,500*
FI[LXV]	-	-	-	-	-	-	-	19,000	-
FR	18,900	-	-	-	25,000	-	-	22,000	30,000**
DE[LXVI]	58,700	-	-	-	-	-	70,000*	70,000*	-
GR	-	-	-	-	-	-	-	3,281	-
IT	-	-	-	-	-	-	-	24,000*	-
LV	1,285	1,580	1,249	1,226	1,183	1,074	1,399	1,376	1,435
NL	13,050	-	-	-	-	13,190	-	-	13,500
PL	-	-	-	-	-	-	-	-	50,000-80,000
SP	23,041	35,214	34,465	37,289	36,781	41,520	32,751	14,523	-
UK	-	-	-	-	16,604	-	-	-	-

Source: ECOTEC Research and Consulting, 2006 (individual sources identified in country reports)
** estimates*
***direct and indirect*

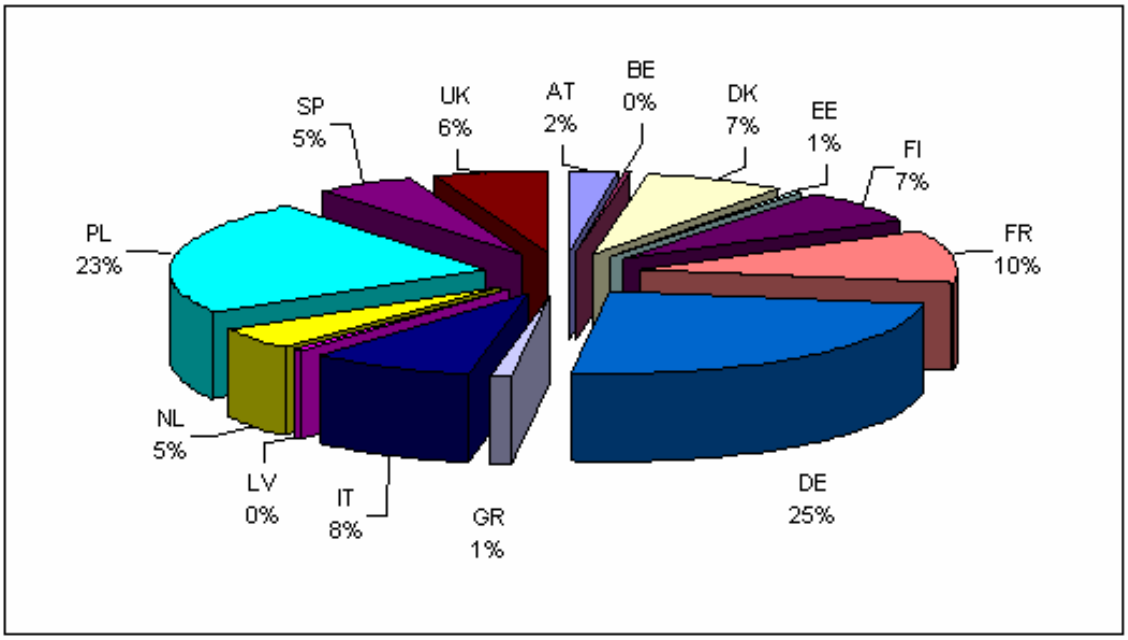
For most countries it was impossible to obtain more than one figure relating to employment in the sector. Therefore making a straightforward trend analysis is not easy. The sectoral stakeholders maintain that the tendencies vary depending on the country. Many countries have experienced a growth but some countries a slight decline. However, the decline has not usually been as severe as in the shipbuilding sector. Overall, employment is likely to have grown slightly due to the increase in exports and outsourcing from the shipyards.

[LXIII] The latest year available for 2004/2005 – but the figure for Belgium is from 2000 the UK from 2001, and Denmark and Netherlands from 2002. Estimations from Poland vary between 50-80,000 – the average of 65,000 is used for this total figure.
[LXIV] EMEC, Future Maritime Policy for Europe, an EMEC point of view
[LXV] The figure also includes some employment related maritime service sector.
[LXVI] Includes also employment related to manufacturing of offshore equipment.

Data was obtained from Denmark for the period 1995-2002. The figures have shown a slight decrease (7.5%) in employment over that period of time. However, this decrease has been considerably smaller than the decrease of employment in the shipbuilding sector. Trends in the Spanish marine equipment industry have been dramatic. The sector employed some 25,000 people in 1995 and over 41,500 in 2002. But employment has seen a remarkably dramatic fall over the past couple of year and in 2004 only employment less than 15,000 individuals. This displays an overall fall of 42%.

In terms of share of employment in the EU-25, Germany is the biggest player in the marine equipment industry by being home to every fourth job in Europe in this field (see graph 4.1 overleaf). Germany is closely followed by Poland which holds 23% of total employment. With estimated 30,000 jobs France is the third largest employer in this field (10%), followed by Italy (8%), Denmark (7%) and Finland (7%).

Figure 4.1 Share (%) of employment in the marine equipment sector, 2004/2005



Source: ECOTEC Research and Consulting, 2006

Major forces behind employment trends have been specialisation and outsourcing in the shipbuilding sector. With the growing trend of specialisation, it has been estimated that approximately 70% of the value of a ship is in the marine equipment[I]. It is believed that the trend towards outsourcing will continue to increase and that in the long-term the shipyards could perform an integrating function only. Outsourcing has been suggested to be weaker in countries which maintain politically induced employment in the shipyards[II].

[I] EMEC, Future Marine Policy for Europe, p.2
[II] These countries include Poland, Spain, Greece, and, to a certain extent Italy.

It is important to notice that the European marine equipment sector is increasingly export-oriented and it does not rely solely on the internal demand. As mentioned earlier, the strongest marine equipment industries in Europe rely also on exports rather than on internal demand only from the domestic shipyards. For example the Netherlands has increasingly focused production on exports - following a slowdown in the shipbuilding sector, which again had an impact on the domestic marine equipment sector. The German and Danish marine equipment sectors are also increasingly export-oriented, with a large part of German industry producing for the Asian market.

At present, the marine equipment sector is composed of many SMEs. There are, however, larger players and in some sub-sectors mergers have been observed (such as diesel engines and propulsion systems). However it has been claimed that these mergers have not resulted in job cuts, at least not at a significant scale.

4.4 Employment forecast

According to EMEC the short and medium term future of the sector seems positive. EMEC has forecast the following:

- Growth of 2.5% in production;
- 1.5% growth in added value; and
- 1% growth in employment[I].

However, after reaching €70bn in 2009, the marine equipment market is likely to start decreasing at an annual rate of 0.5%[II].

The key factor for sustainable growth for the sector in Europe is innovation and investment in R&D, mainly due to the increasing demand for specialised vessels and specialised solutions for the marine sector as a whole. One of the promising segments seems to relate to environmental systems. For example, at present, the International Maritime Organisation (IMO) is looking at the issue of ballast water and its disposal. Another important market segment that is likely to develop in the future is gas shipping and LNG carriers, as well as gas treatment technologies. Another market segment that is likely to grow is the cruise ships segment, with such solutions as ventilation, air-conditioning, onboard entertainment or computer navigation. However, cruise shipping is becoming more and more disconnected from shipping and become increasingly related to the

[I] EMEC, Future Marine Policy for Europe, p.2
[II] Douglas-Westwood, p.112

tourism and entertainment industry. Therefore, the demand in that segment will continue to be affected by factors outside the maritime cluster.

Due to increased competition, some countries are likely to be forced to focus their activities on specific market niches, such as super yachts. Another trend which can be observed is relocation of production to other non-EU and non-European countries. This allows companies to increase their turnover and production but not necessarily employment if the production does not take place in Europe. That is the case of diesel engine companies[I].

Overall, it is expected that the employment levels will be maintained or will slightly increase. This is due to the fact that the internal demand will stabilise and external demand will grow[II]. However, some say that this orientation might be slightly short-term as the emerging markets, such as China, are likely to develop their expertise as well. This is confirmed by the assessment by Douglas-Westwood, which have estimated that the value of industry will start declining in 2009.

Turning to look at individual countries more closely, the Estonian stakeholders have confirmed that the workforce is likely to increase slightly, especially in companies that produce specific equipment for recreational vessels. In Germany, it is expected that incoming orders will further increase which is likely to have positive impact on the workforce. Moreover, German suppliers have increased their presence in Asia in order to service this market at the same time maintaining their position in Germany. In Finland, the demand for highly skilled workers is increasing and is likely to grow further. At present, some posts are being filled by foreign workers.

One of the factors that has the potential to exert a negative influence on employment is price. It is believed that the price pressures on the shipbuilding industry will increase, which will in turn affect the marine equipment sector. Innovation and investment in R&D are the factors most likely to help trigger positive employment effects in the sector.

4.5 Skills and training

Marine equipment sector is a complex sector with a wide array of specialisations. Therefore, the exact assessment of existing and necessary training and skills is very difficult. Moreover, this high dominance of SMEs makes it difficult to apply uniform sectoral training provisions. In some countries, such as the UK, it has been specifically recognised that there is insufficient insight into workforce development issues in this sector.

[I] Vision 2020, Waterborne transport and operations, A key asset for Europe's development and future, p.8
[II] An interview with the representative from EMEC, 2006

Since the marine equipment sector is closely related to the shipbuilding sector, such trends as specialisation and increasing high tech input of the production also apply to the skill developments in the marine equipment sector. Some skill shortages among certain specialist categories of staff have been reported. In Germany, the sector already faces shortage of experts in design and service. For example, each year approximately 30 naval architects leave university, whereas the demand is for at least 70 per year. In Finland, there is insufficient number of applicants to the colleges in the field of marine engineering.

5.0 Seaports and related services

The sector of seaports and related services provides employment in cargo handling, shipping related activity (storage, agency, maritime logistics and expedition), management and administration of ports and maritime pilotage.

According to the European Sea Ports Organisation (ESPO) there were 976 ports in the EU-25 in 2002, of which 279 were significant ports handling more than 1 million tonnes of traffic. Rotterdam, Antwerp and Marseilles remain the largest ports in Europe in terms of tonnage. On average European ports handle 3.5 billion tonnes of cargo per year and 350 million passengers – the equivalent of 70% of the entire European population. Europe's share of the market amounted to €10.5 billion or 42 percent in 2004[I].

5.1 Economic impact

It has been estimated by the ESPO that the seaport sector accounts for about €20 billion of added value in Europe. However, the integration of shipping, sea ports and road transportation services necessarily means the total value of the sea port sector greatly exceeds this figure. The economic contribution of the sea port sector is demonstrated by Spain and Malta where the sector accounts for around 1% of the GDP.

Although a port liberalisation programme started in Europe many years ago, the great majority of ports are in public ownership and as a result some suffer from low productivity. Nevertheless, the European Transport Workers Federation claims that costs for container handling in Europe is on average half of that in the US and less than half of the cost in Asia.

5.2 Availability of employment data

Availability of employment data for the seaport sector is limited and available statistics are highly fragmented. This is mainly caused by the differences in definitions for seaport related employment and due to the lack of systematic data collection for the sector. The port sector is not separately defined in the standard industrial classification systems (SIC) of businesses, which means that standard economic statistics collected by the national statistics offices can not be related directly to the ports sector.

[I] Marine Industries Global Market Analysis (2006) Douglas-Westwood

Different definitions by different Member States also make the assessment of the real level of employment difficult. The complexity of data collection for the sector can be demonstrated by the case of the port of Rotterdam, which had some 5,741 persons employed in activities associated with cargo handling in 2003, but total direct port-related employment stood at 44,384. In addition, 14,391 individuals were employed in port 'industries' such as oil refining, shipbuilding & repair, etc, which brings the total up to 58,739. In addition to the nearly 59,000 'direct port-related employment', it is claimed that the port of Rotterdam generates indirect employment for 250,000 people[I]. Similarly in Denmark, a recent report showed that Esbjerg Port, which directly employs 64 people, contributes to nearly 7,000 employment years in the region[II].

In some countries, it proved impossible to find any reliable employment data for this sector (e.g. Greece).

5.3 Employment trends

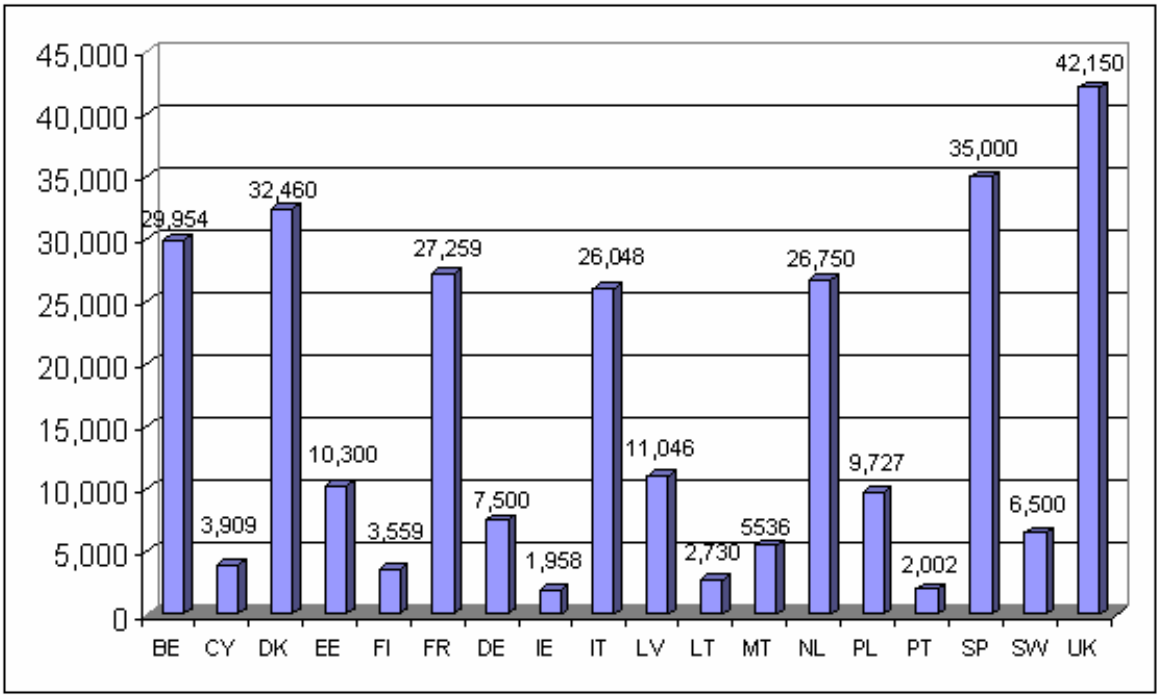
In 1997, seaports and related services provided approximately 350,000 jobs. This study concluded that the seaports of the EU, together with related services, employed 284,000 individuals in 2005[III]. However, it must be recognised that the figure for direct employment is likely to be a slight under-estimation of actual employment in the EU-25 due to the fact employment data is currently missing for Greece, which brings the total figure down. On the other hand the figures for Denmark also include maritime service employment.

[I] Marine Industries Global Market Analysis (2006) Douglas-Westwood

[II] Afledt effekter af aktiviteter pa Esbjerg Havn (2005) Hahn-Pedersen and Sondergaard

[III] The latest figure for Spain is from 2000; France and Netherlands from 2002; Belgium, Portugal and Poland from 2003; Ireland, Italy and Latvia from 2004.

Figure 5.1 Employment in seaport sector, EU-25



Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

Information on indirect employment data is even more fragmented than direct employment data and often includes other core maritime sectors, such as shipping, which are classified separately in this study. However, the figures obtained for indirect employment from some of the larger Member States reach up to 330,000.

Table 5.1 Employment in the European seaports and related services, 1997-2005

	1997	1998	1999	2000	2001	2002	2003	2004	2005
BE	30,499	30,017	29,710	29,115	29,225	29,121	29,954	-	-
CY	2,150	-	-	3,909	-	-	-	-	-
DK[I]	29,211	30,053	30,449	31,031	32,462	32,460	-	-	-
EE	5,300	8,000	12,200	11,200	12,000	9,600	10,500	11,900	10,300
FI	3,650	3,666	3,674	3,616	3,554	3,486	3,466	3,529	3,559
FR	-	-	-	-	-	27,259	-	-	-
DE	-	-	-	-	-	-	-	-	7,500
IE	-	-	-	-	-	-	-	1,958	-
IT	-	-	-	-	-	-	-	26,048	-
LV	-	-	-	-	-	-	-	11,046	-
LT	-	-	-	-	-	-	-	-	2,730

[I] This figure also includes employment in maritime services.

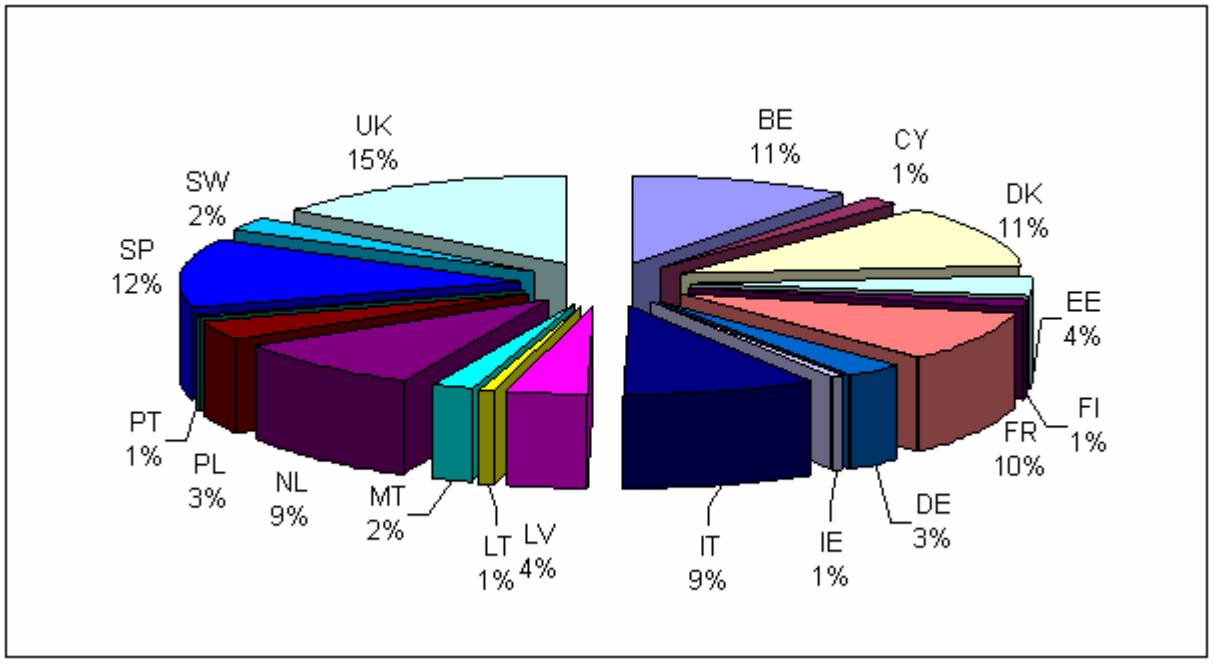
	1997	1998	1999	2000	2001	2002	2003	2004	2005
MT	-	-	-	-	-	-	-	-	5,536
NL	26,600	-	-	-	-	26,750	-	-	-
PL	-	-	-	-	11,547	10,220	9,727	-	-
PT	685	673	973	901	1,525	1,988	2,002	-	-
SP	-	-	-	35,000	-	-	-	-	-
SW	-	-	-	-	-	-	-	-	6,500
UK	-	-	-	-	-	-	-	-	42,150
Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**279,413**
Indirect	-	-	-	-	-	-	-	-	330,756

Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

As a result of the lack of consistent data it is difficult to draw any comprehensive conclusions on employment trends, though consultations with national stakeholders have revealed that employment has remained relatively static or even declined in most EU-25 countries, with some notable exceptions. The data presented in Table 5.1 above indicate that employment has declined slightly over the past decade in Belgium, Finland, France and Poland, but at the same time has seen considerable increases in countries like Estonia, Cyprus and Portugal.

United Kingdom, Spain, Denmark, Belgium, the Netherlands and France all hold 10% or more of total ports related employment in Europe and together constitute 72% of total European employment (although figures for Denmark include the wider maritime service sector).

Figure 5.2 Share (%) of employment



Source: ECOTEC Research & Consulting, 2006

Looking more specifically at the various sub-sectors, the table 5.2 below shows that there has been a substantial fall in employment in maritime pilotage over the last ten years, despite a large increase in maritime traffic. Indeed, employment has fallen by on average 17% over the last ten years. In the UK and the Netherlands, both large maritime nations, the fall in pilotage employment has been even greater, with 28% and 35% respectively. The general fall in employment in pilotage has partly been caused by the recent reorganisation and increased efficiency (better communication and logistics) in ports. Importantly, the introduction of Pilot Exemption Certificates (PEC) for certain ships/masters regularly calling into ports, and the exemption from compulsory pilotage for small vessels have also contributed to the fall in employment.

In respect of cargo handling employment, some countries, particularly Cyprus, Estonia and Portugal, have witnessed a significant increase. However the overall employment trend for cargo handling has been relatively static or even showed signs of decline. In most countries, with the exception of the Netherlands, employment in port administration has declined slightly over the last ten years. This negative employment trend is likely to be a result of the reorganisation of ports and the redefinition of responsibilities.

Table 5.2 Employment in seaports and related services[I]

	Cargo handling (incl. shipping related activity)			Port administration			Maritime pilotage		
	1997	2002	Δ%	1997	2002	Δ%	1994	2005	Δ%
Belgium	-	-	-	-	-	-	420	393	-6.4
Cyprus	1,763*	3,566***	-	365*	311	-14.8	22*	23***	4.5
Denmark	-	-	-	-	-	-	150	111^^	-26.0
Estonia	5,300	9,700	83.0		900	-	-	58	-
Finland	2,511	2,491	-0.8	1,139	995	-12.6	318*	255	-19.8
France	5,141	4,791****	-6.8	5,504**	5,428	-1.4	390*	348	-10.8
Germany	-	-	-	-	-	-	940	867	-7.8
Greece	-	-	-	-	-	-	63	48	-23.8
Ireland	1,131*	778	-31.2	-	-	-	52	46	-11.5
Italy	-	-	-	-	-	-	226	224	-0.9
Latvia	8,143	8,022	-1.5	-	932^^^^	-	-	42	-
Lithuania	-	2,159	-	-	-	-	-	25	-
Malta	-	-	-	-	-	-	-	15	-
Netherlands	23,430	23,645	0.9	1,690	1,831	8.3	650	420	-35.4
Poland	10,218**	8,940	-12.5	1,329****	1,280	-3.7	92	88^^^	-4.3
Portugal	685	1,988	190.2	-	-	-	82	87^^	6.1
Slovenia	-	-	-	-	-	-	-	6	-
Spain	-	-	-	-	-	-	-	248^^	-
Sweden	-	6,500^^^^	-	-	-	-	288*	225	-21.9
UK	-	22,180^^^	-	-	8,680^^^	-	800	576	-28.0

*Source: ECOTEC Research and Consulting; * 1995; **1999; ***2000; ****2001; ^2002; ^^2003; ^^^ 2004; ^^^^2005*

5.4 Employment forecast

Global port activity is set for long term growth, driven by increasing seaborne trade with the world's developing economies. Though, as mentioned above, more capital expenditure will be required to expand port capacity and tackle growing congestion. The growth of the cruise market will also bring opportunities for port development. An added dimension to the port sector will also be the desire to increase short sea shipping to counteract the growing congestion of land transportation systems[II]. Indeed, FONASBA/ECASBA actively promotes and supports the development of short sea shipping as this would increase

[I] Please not that employment figures for maritime pilotage only refers to the number of pilots and does not take into account the other support personnel necessary for embarkment, disembarkment, helicopter pilots, administrative personnel etc..

[II] Marine Industries Global Market Analysis (2006) Douglas-Westwood

employment in ship brokerage and agency in smaller ports that currently do not benefit as much as the larger ports. Moreover, it would help to regenerate peripheral economies and generate employment in areas of high unemployment.

Despite this positive outlook it is projected that there will only be relatively small changes in sea port employment over the next few years. There are many reasons for this. Firstly, the increasing privatisation of ports is likely to lead to operational efficiency savings. Secondly, investment in new technology (more modern ships and handling technology) by both seaport and shipping companies will reduce labour intensity. Finally, the increasing trend towards greater concentration of activity around a number of logistics centres is likely to lead to significant efficiency gains through economies of scale. As an example, almost 70% of the total goods transport in Danish ports was concentrated in the ten largest traffic ports in 2001. Within the next few years, this concentration of traffic is likely to increase to 80-85 percent[I]. The same tendency is seen all over Europe and as a result many ports will have to decide whether they want to compete with other ports or whether they should give way for housing development or focus on tourism.

The recent rejection by the European Parliament of Port Package II, which would have introduced sweeping changes and liberalisation in the operation of ports, for example authorising ship crews to unload ships themselves and ship owners to run freight terminals, is believed to have been important for the future of the port sector. Indeed, according to the trade unions, the proposal would have meant the loss of thousands of jobs and the deterioration of social standards. For some port operators and employers' organisations, the proposed measures did not go far enough towards creating greater competition for the provision of different ports services. Some critics say that the Ports Package II would have achieved the contrary of what it set out to do, namely to secure the future of Europe's ports[II].

In respect of maritime pilotage, it is not expected that there will be a further fall in employment. Indeed, EMPA has become increasingly concerned about the recent decline in the number of pilots and warns that a critical point has been reached for pilot services. EMPA also suggests that workloads cannot be increased further, nor can costs be further reduced without jeopardising the overall quality of the pilot services. Policy makers therefore need to put more focus on the consolidation of existing pilot services and the future demand for pilots due to the increase of maritime traffic[III].

[I] The leading harbours of the future (2002) Jensen (www.covi.dk)
[II] EurActiv (19th January 2006) Parliament rejects port services directive; http://www.euractiv.com/en/socialeurope/parliament-rejects-port-services-directive/article-151713
[III] EMPA (2006) http://www.empa-pilots.org/pdf/EMPA%20Maritime%20Policy.pdf

5.5 Skill needs and labour availability

The skill demands on people working in sea ports as cargo handlers are generally speaking relatively low. However the skill requirements may vary widely between sea port companies depending on what kind of cargo handling they are involved in. Moreover, the demand for specialised skills are continuously increasing and more and more companies are demanding that their employees are well educated, have ICT experience and have appropriate language skills.

The sector has historically recruited people at a young age and provided training on the job. However, as the public profile of the seaport sector is declining and new opportunities are becoming scarce - as reflected by the lack of employment growth – it has become increasingly difficult to recruit new labour. Most of the new recruits, particularly in cargo handling, ship brokerage and ship agency, generally have a relative that works within the sector.

Sea port administrations and related services sector (pilotage, towage, harbour master, ship survey, traffic services, international organisations) offer good employment opportunities for employees from other maritime sectors, particularly former sea farers. At the same time, workforce mobility from the sea ports sector to other maritime sectors is considered to be relatively low in most EU countries. To some extent this explains the relatively low staff turnover that characterises the sector in most countries.

In respect of maritime pilotage, reports have shown that many European countries are facing growing difficulties in finding qualified applicants for pilot services. This is largely connected to fact that there are decreasing numbers of experienced officers and masters, which affects the maritime pilotage sector as the minimum qualification for becoming a pilot in Europe is mostly experience as a master or chief officer. A further problem with recruitment is that the pool of potential applicants is not as international as the supply of seafarers. Although all citizens of the European Union can apply, requirements regarding language and place of residence reduce professional mobility and restrict the number of potential applicants. A number of intensive recruitment campaigns have managed to reduce the labour shortage to some extent, but it remains difficult to replace pilots who take retirement or to account for the increased traffic[I].

Finally, the increasingly important role of European seaports as strategic logistics centres is increasing demand for highly skilled experts in transport and logistics. Indeed, the vertical integration strategies of the market players have blurred the traditional division of tasks within the logistics chain. This development in Europe is enhanced by the

[I] EMPA (2006)

increasingly interlinked land-based and maritime transport corridors, which are being further developed for example with the EU support (e.g. TEN-T).

6.0 Recreational boating

The recreational boating sector comprises of boat builders; marine engine manufacturers; high technology electronics companies; equipment manufacturers; builders and operators of supporting infrastructure; and trade and service providers.

European residents[I] own 6 million boats, not including canoes, kayaks, sailboards and other small boats (those under 2.5m or lightweight inflatables). An estimated 32 million European residents participated in recreational boating activities on an annual basis. Boat ownership per head is particularly high in the Scandinavian countries, almost ten times that of other countries. Similarly, the boat parks in these countries are around a third of the total, which is significant given that the residents of these countries only account for around 4% of the total population in Europe. In Europe the main type of boats used are sailing boats, whilst in North America motor boats and power boats are more common.

Although the European market is relatively small compared to the North American market, growth over the last 12 years has been steady in most parts of the EU and there is currently no sign that the public's appetite for boating will diminish[II]. A slowdown has been experienced in Germany – mainly as a result of the general economic and labour market difficulties, and the Netherlands, reflecting the low confidence of its neighbour[III].

The industry is highly competitive and strongly underpinned by modern and advanced production engineering. Currently, the EU is the global leader in super yachts, production sailing yachts and custom and semi-custom power yachts[IV]. Indeed, Italy remains the leading producer of yachts in the world, followed by the US, the Netherlands and the UK. Germany (6), Denmark (9) and France (10) also make into the top ten of yacht building nations.

6.1 Economic impact

In the European Overview 2004[V] it was estimated that the recreational boating industry comprised some 37,200 businesses generating in the region of €23.4 billion in revenue in

[I] Including Norway, Switzerland, Croatia, Romania, Bulgaria and Turkey.
[II] Towards a Future Maritime Policy for the Union: A European Vision for the Oceans and the Sea from a Recreational Marine Industry Perspective (2005) European Union Recreational Marine Industry Group (EURMIG)
[III] Boating Industry Statistics 2004 (2005) ICOMIA
[IV] Towards a Future Maritime Policy for the Union: A European Vision for the Oceans and the Sea from a Recreational Marine Industry Perspective (2005) European Union Recreational Marine Industry Group (EURMIG)
[V] European Overview 2004: Marine leisure industry at your fingertips (2004) British Marine Federation (Note that all values include six non-member countries, Norway, Croatia, Bulgaria, Switzerland, Romania and Turkey)

2003. Overall, the "big four" – Germany, France, Italy and the UK – accounted for two-thirds of retail spending and 63 percent of industry revenues. Retail spending in the Scandinavian countries was estimated to be over 14 percent of the total. Although Germany has experienced a slight decline in its recreational boating market, it still made the largest contribution to spending - in line with its share of the population. In value terms, Italy is the largest marine leisure market, particularly in boat building, heavily influenced by the super yacht and large yachts sector. France produces the greatest number of boats, accounting for 38 percent of the total in volume terms. Overall, 49,900 units were manufactured in France in 2003, this includes the production of 8,900 sailboats. The UK is the largest European producer of inboard/stern drive motor boats over 12m, with its internationally recognised brand. Production of exclusive, high value yachts over 24m (super yachts) in the Netherlands, Italy in Germany makes a very significant contribution to the European recreational boating industry.

The most successful European businesses, whatever their size, have invested significant efforts in developing the export market. In fact, there is a strong correlation between failed businesses and those who attempted to serve only their domestic market[I]. The value of exports and imports in the EU-25 countries is outlined in the table 7.1 below.

Table 6.1 Value of imports and exports (€1,000), 2004

	Imports	Exports	Balance of trade
Austria	34,505	27,625	- 6,880
Belgium	50,595	34,267	- 16,328
Cyprus	3,783	2,520	- 1,263
Czech Republic	1,096	344	- 752
Denmark	30,262	73,839	43,577
Estonia	5,807	6,667	860
Finland	28,245	63,520	35,275
France	395,700	550,000	154,300
Germany	97,404	744,853	647,449
Greece	53,859	3,738	- 50,121
Hungary	823	668	- 155
Ireland	5,526	1,992	- 3,534
Italy	304,000	983,000	679,000
Latvia	1,081	288	- 793
Lithuania	1,364	517	- 847
Luxembourg	585	-	- 585

[I] Towards a Future Maritime Policy for the Union: A European Vision for the Oceans and the Sea from a Recreational Marine Industry Perspective (2005) European Union Recreational Marine Industry Group (EURMIG)

	Imports	Exports	Balance of trade
Malta	67,923	9,445	- 58,478
Netherlands	113,703	384,674	270,971
Poland	1.609	n/k	n/k
Portugal	16.790	580	- 16.210
Slovakia	2.149	40	- 2.109
Slovenia	36.261	59.493	23.232
Spain	887.356	603.526	- 283.830
Sweden	92.898	137.314	44.416
UK	291.114	559.034	267.920

Source: ICOMIA, 2004

Among the EU-15, Germany, Italy, the Netherlands and the UK have significant trade surpluses in the boating industry – highlighting their competitive position. Conversely, Spain is the largest importer of boats and equipment – indicating its role as a tourist destination rather than a manufacturer of boats and equipment. Among the new member countries, Slovenia has a significant trade surplus in the boating industry, whilst Malta is a net importer of boats and equipment. The only country for which data has not been provided is Poland, however, given Poland's increasing share of total production and the limited demand in the home market, a significant proportion of its production is likely to be exported.

6.2 Availability of employment data

Data on employment in the recreational boating sector in the EU-25 is somewhat inconsistent – reflecting the problems of defining the industry and the lack of systematic data collection and analysis in many countries. Although some countries, such as Germany, Belgium, the Netherlands and France, have recently undertaken studies to measure the economic significance of the recreational boating industry, there is still a lot to wish for. There is also an issue with how to distinguish between employment related to inland waterways and the sea. The data in this summary relates to recreational boating in both inland waterways and seas; detailed national chapters provide the industry breakdown by the type of waterway for two study countries (Finland and Ireland).

When looking at employment data only, the statistics collected at national level from the national statistics offices and organisations representing the recreational boating industry provided a range of different results - because of the wide variety of definitions for the industry and due to the lack of systematic data collection.

For the purpose of comparability in this overview, statistics from studies commissioned by the British Marine Federation (BMF) and ICOMIA have been used and analysed. A

comprehensive overview of the European recreational boating industry was published by the British Marine Federation in 2004[I]. Employment data for the recreational boating sector has also been published by ICOMIA in the Boating Industry Book 2004[II]. But it must be noted that even figures from these two studies varied. This is partly a result of different years being used, 2003 and 2004 respectively, but also as a consequence of different methodologies being used to obtain the estimates.

The data for the study collected by the BMF gathered information from marine industry associations and leading trade journals. Where there were gaps in existing knowledge BMF produced its own 'best estimate' with a support of a numerical model to validate the results presented.

In the ICOMIA boating industry book 2004, employment in the recreational boating represents the grand total of all employees covered by three distinct groups (only available for 9 countries):

- Group A (main section): Producers, boat builders, equipment and clothing manufacturers, sail makers and engine builders;
- Group B (support section): Service providers, marina operators, charter boat companies, insurance, naval architects, trade magazines, boat transportation companies, marine equipment suppliers and shops, fuel, maintenance, distributors/dealers brokers;
- Group C (other services): Travel agents, marine/marina hoteliers, servicing of marinas/yacht harbours, marina (general store) shops, food and drink provisions/stores.

[I] The British Marine Federation used data collected by marine industry associations and information from leading trade journals. Where there were gaps in existing knowledge BMF produced its own 'best estimate'. Additional information and logical assumptions were also made to provide a comparative breakdown of the marine leisure market. A numerical model was developed and used to validate the results presented. Employment is estimated for four sub-sectors, namely boatbuilding, marine engine manufacturing, marine equipment manufacturing and trade and service providers.

[II] In the ICOMIA boating industry book 2004 employment in the recreational boating represents the grand total of all employees covered by three distinct groups: Group A (main section): Producers, boat builders, equipment and clothing manufacturers, sail makers and engine builders; Group B (support section): Service providers, marina operators, charter boat companies, insurance, naval architects, trade magazines, boat transportation companies, marine equipment suppliers and shops, fuel, maintenance, distributors/dealers brokers; Group C (other services): Travel agents, marine/marina hoteliers, servicing of marinas/yacht harbours, marina (general store) shops, food and drink provisions/stores.

6.3 Employment trends

Employment estimates for the EU-25 using these two sources are presented in the table below. Using the estimates from the British Maritime Federation study[I], total employment in the EU-25 was just over 253,000 in 2003.

Table 6.2 Employment in the recreational boating industry

Country	Employment 2003*	Employment 2004*
Austria	960	
Belgium	940	
Cyprus	515	
Czech Rep.	150	
Denmark	5,290	
Estonia	470	
Finland	6,750	3,000
France	41,200	47,117
Germany	26,900	20,000
Greece	4,270	
Hungary	280	
Ireland	2,850	1,200
Italy	92,900	89,000
Latvia	95	
Lithuania	130	
Luxembourg		
Malta	210	
Netherlands	20.700	21.330
Poland	2,910	3,000
Portugal	2.480	1.500
Slovakia	65	
Slovenia	760	
Spain	9,020	
Sweden	6,930	4,000
UK	26,400	28,605

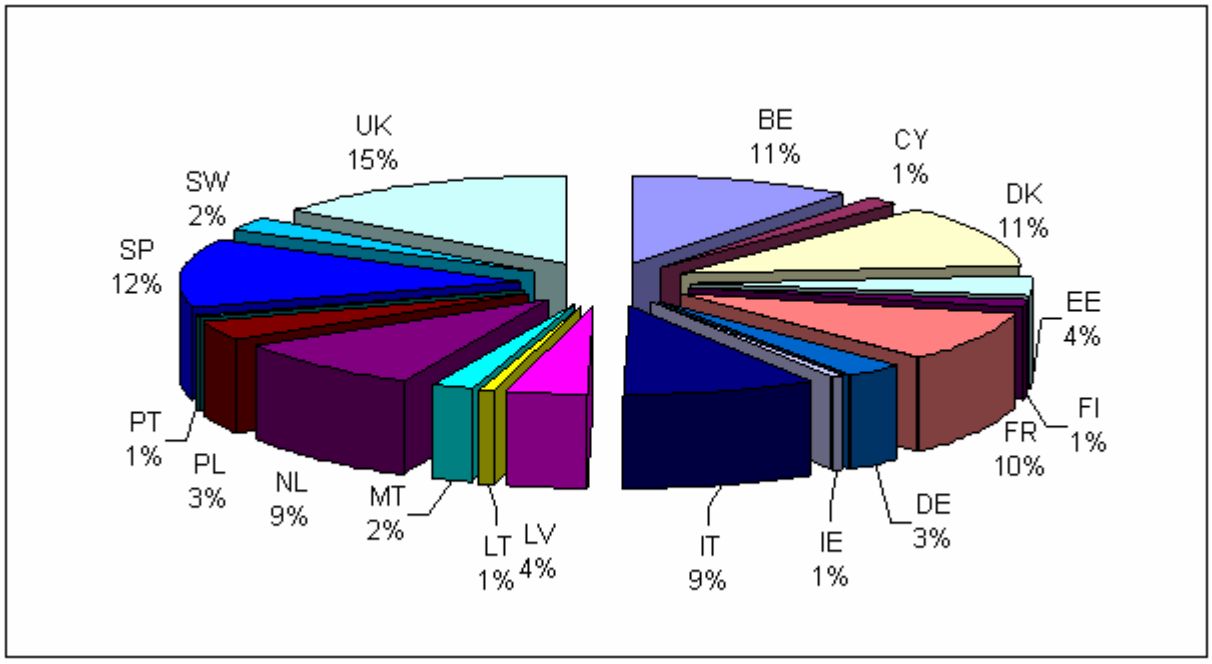
*Source: ECOTEC based on data from *BMF, 2004; ** ICOMIA, 2005*

The largest employer was Italy with 92,900 employees, followed by France (41,200), Germany (26,900), the UK (26,400) and the Netherlands (20,700). These five countries

[I] European Overview 2004 – Leisure Marine Industry at Your Fingertips (2005) British Marine Federation

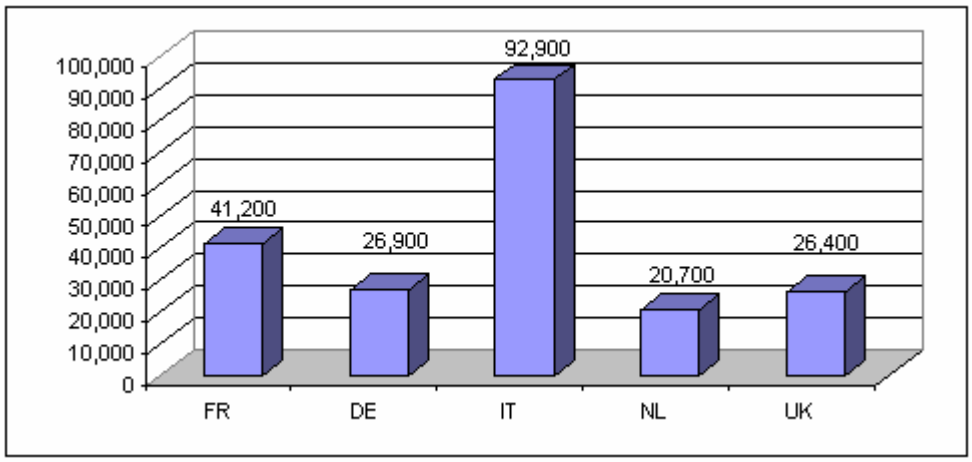
are also the largest employers in the ICOMIA report. The following graphs 6.1 and 6.2 provide a more detailed breakdown by the share of employment for all EU countries and for the 5 largest ones, in terms of employment.

Figure 6.1 Share (%) employment by country



Source: British Marine Federation

Table 6.3 Share of employment between five leading countries



Source: British Marine Federation

When looking at the sub-sectors of the recreational boating industry, table 6.3 below reveals that a relatively large proportion of employment in the new member states, particularly Poland, Lithuania and Estonia, are in boat building. In absolute terms though, Italy, France and the UK employ the largest number of people in boat building. Marine engine manufacturing is not well developed in the EU and only seven countries are active

in this sub-sector. Significantly, Sweden account for more than half of total employment in the EU.

Marine equipment manufacturing accounts for a similar share of total employment in most countries, though Finland, Denmark and Ireland have a relatively high proportion of employment in this sub-sector. In absolute terms, Italy, the UK and France employ the largest number of people in the marine equipment sector. In respect of the trade and service provider sub-sector, it appears to account for a larger proportion of total employment in the southern European countries – highlighting their role as tourist destinations. Notably, nearly all of the employment in the recreational boating industry in Malta (95%) and Slovakia (85%) is accounted for by the trade and service provider sub-sector. In absolute terms, Italy, France and Germany employ the largest number of people in the trade and service provider sub-sector.

Table 6.4 Employment by sub-sectors

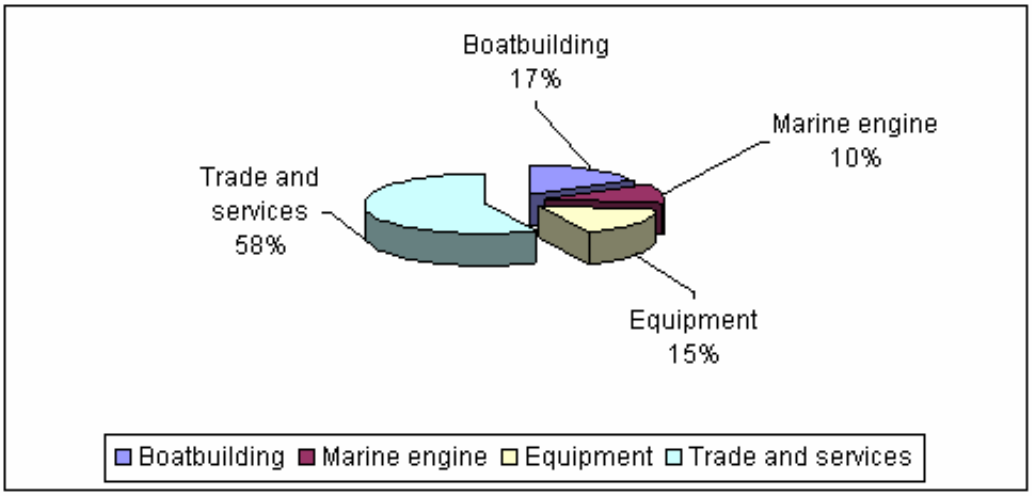
Country	Total employment	Boat building	Marine engine Manufacturers	Marine Equipment manufacturers	Trade and service providers
	number	%	%	%	%
Austria	960	6	-	28	66
Belgium	940	24	-	26	50
Cyprus	515	11	-	10	80
Czech Rep.	150	7	-	17	77
Denmark	5,290	17	0.3	35	48
Estonia	470	44	-	27	30
Finland	6,750	28	-	37	35
France	41,200	18	0.1	22	60
Germany	26,900	21	3.2	18	58
Greece	4,270	10	-	13	77
Hungary	280	20	-	16	64
Ireland	2,850	6	-	30	65
Italy	92,900	14	0.04	11	75
Latvia	95	26	-	21	53
Lithuania	130	50	-	19	31
Luxembourg		-	-	-	-
Malta	210	-	-	5	95
Netherlands	20,700	26	0.4	17	57
Poland	2,910	51	-	19	30
Portugal	2,480	18	-	11	71
Slovakia	65	-	-	15	85

Country	Total employment	Boat building	Marine engine Manufacturers	Marine Equipment manufacturers	Trade and service providers
	number	%	%	%	%
Slovenia	760	30	-	20	49
Spain	9,020	14	-	15	71
Sweden	6.930	17	22.1	17	43
UK	26,400	30	1.1	23	46
Total	**253.175**	**19**	**1.1**	**17**	**63**

Source: BMF, 2004

If we look at the share of different sub-sectors from total employment in Europe (Figure 6.2) it is clear to see that most jobs in this sector are in related trade and service fields. Boat building takes a 17% share of total employment.

Figure 6.2 Share of employment by sub-sector, Europe total



Source: BMF, 2004

Because of the inconsistencies in the employment data in the EU-25 it is very difficult to determine the countries, which have experienced a growth in employment in recent years. Nevertheless, it has been found that employment has increased in recent years in countries such as Denmark, Finland, Ireland, Poland and the UK, whilst countries such as France, Italy, the Netherlands, Portugal and Sweden have experienced a slight decline in employment since 2003. The growth in Poland, particularly in the manufacturing of recreational boats, has largely been influenced by its relatively low labour costs.

6.4 Employment forecast

The EU recreational boating is expected to grow by 5-6% annually in the near future. The projected growth can partly be attributed to the fact that the "baby boomer" generation is reaching retirement age, there is increasing wealth among people in their middle age and

more importantly there is huge potential in the emerging economies. Given that the industry is relatively labour intensive, this growth in production is likely to have a positive effect on employment. In respect of the individual member countries, Poland has the most positive economic outlook and can expect to employ a greater number of people, particularly in boat building. Other countries that are expected to grow include Denmark, Finland, Germany and Ireland. Portugal on the other hand has a slightly weaker economic outlook. Presumably, Portugal will remain an important tourism destination, but may lose some of its manufacturing activities to the emerging economies in Eastern Europe.

Despite this positive outlook, EURMIG[I] has identified a number of underlying weaknesses and challenges that need to be addressed by the industry in order to reach full economic and employment potential in the future:

- With SMEs making up 98 percent of all businesses in the industry, there is a lack of corporate structure and experience in growing a business.
- The industry is particularly vulnerable to the economic cycle as a result of its dependence on consumer's discretionary expenditure. Importantly, SMEs are less able to survive the bad times.
- The main threat to the European recreational boating industry is that manufacturing may be lost or outsourced to China, or other emerging economies in the Far East, where labour costs are significantly lower. Nevertheless, given that the sector needs skilled labour, this threat is likely to be less limited.
- The recreational boating industry is sensitive to sudden increases in costs and the full implications of the huge increase in the oil price, which has affected not only fuel costs but industry raw materials too, are yet to be seen. Labour costs are also currently relatively high in the EU, at least in the EU-15.
- Outside the market leaders, businesses lack resources for research and development, which will be critical if they are to survive against increasing competition from emerging economies.
- The multitude of regulations places a disproportionate burden on SMEs. Indeed, keeping up to date with their existence is challenging enough, let alone coping with the demands of their implementation.
- It is important to recall that recreational boating is not a mass production industry, even in the engine sector. Companies operating in this field have to prepare customised solutions, often without being able to recover development costs through higher profit margins as a result of price competition in the sector.
- The industry has faced and continues to face significant pressures from environmental legislation, despite industry representatives' claims that environmental protection is a

I European Union Recreational Marine Industry Group (EURMIG)

core value of the industry. The requirement to reduce engine exhaust emissions has been accepted and is being implemented.

- The Habitats and Birds Directives have all but closed the development of yacht harbours in large areas along the EU's coastlines. This has had a negative influence on the development of the industry with new boat purchases tending to be replacements for existing boats rather than new entrants, as finding an available boat mooring becomes ever more difficult. The demand for boat moorings is particularly high in Sweden and the UK.
- The recreational boating industry faces commercial challenges from emerging economies in the equipment sector and this will soon spread to some of the mass produced smaller boats. Similar cost pressures are being faced from large US corporations which are buying up smaller companies in certain sectors. With such pressures significant consolidation can be expected in Europe in some segments over the next 10-15 years.
- Finally, in many member states there are challenges in recruiting, training and retaining a quality workforce.

6.5 Skills and Training

Overall, the European recreational boating sector faces challenges in recruiting, training and retaining skilled workers. This is partly a result of the highly specialised skills (e.g. working with materials such glass fibre etc) that are needed in the industry. Importantly, the recreational boasting industry is also different to other manufacturing industries, such car manufacturing, in that it is relatively labour intensive and that it is not producing for a mass market. Generally, there is a shortage of engineering and technical staff, but in Belgium it has also been highlighted that there is a need for staff with specific administrative and management knowledge. Administrative expertise is particularly important given the substantial and complicated administrative requirements (regulations) in the sector. In Finland it has also been shown that there is a shortage of electricians, laminators and carpenters.

Although staff turnover is relatively low in northern Europe, there are some problems with retaining staff in the recreational boating industry, particularly in southern Europe. Given recent growth and increasing opportunities in the Eastern European countries, retaining staff may become difficult in these countries as skilled labour may be tempted away from the countries or the sector[I].

[I] ICOMIA (2006)

7.0 Shipping

The European shipping industry plays a key role in global trade with the EEA registered fleet representing 25% of the world tonnage and more than 40% of the global fleet is controlled by EEA based owners[I].

The growth in European shipping has been substantial over the past years. The EEA registered fleet increased to about 26 % of the world fleet between 2003 and 2004. This represents an increase of more than 50 % compared to the previous year. Clearly the fleets of the new EU countries contributed to this but even without these fleets there was growth of almost 5%.

7.1 Economic impact

The European shipping and maritime transport market has been estimated to be worth €151 billion in 2004[II], with 90% of external trade and 40% of internal trade in European Union being made by sea (in terms of value)[III]. The significance of the industry is also demonstrated by the fact that European shipping sector does not only play an important role in maritime transportation to and from Europe but also in the global trade by being an important player in maritime transport between continents outside of Europe. In fact a substantial share of the turnover of the EU's shipping is earned outside the EU.

In global terms the strength of the European maritime transport industry lies in the great European shipping heritage, high standards and quality and relatively efficiency of port controls in Europe. Many of the maritime administrations are also leading ones in the world. The main threat for the industry is the difficulty in remaining competitive. This refers, for example, to labour costs and consequently, the representatives of the shipowners have stated that imposing rules for European shipowners that are not applicable to competitors can put European shipping companies at a disadvantage. The European Community Shipowners' Associations promote adoption of global guidelines for the shipping industry. The tools and policies that have been adopted at European and national levels to increase competitiveness of the European fleet and to improve the labour market situation of EU seafarers are discussed in more detail in the policy section of this report.

[I] ECSA, 2005
[II] Douglas-Westwood Ltd (2005) Global marine industries – global market analysis. Marine Institute.
[III] European Commission, DG TREN.

7.2 Availability of employment data

It is widely recognised that the presentation of an accurate picture of the seafaring workforce is rendered difficult by the specific characteristics of the industry, such as the flag and registration status, a lack of clarity over ship ownership and a lack of systematic data collection at European level. The national statistical offices collect data for the sector of 'sea and coastal water transport' but these figures only cover a small proportion of total employment in the shipping sector as many European ships are registered in countries outside of Europe and are not always in a position of having to clarify the level of employment in Europe. Furthermore, many European vessels sail from continent to continent outside of Europe and crews can often be employed on short term contracts. All these factors complicate the projection of employment in this sector.

The following table gathers employment data for the shipping sector, collected from national cluster studies, national shipowners organisations, shipping registries, national ministries and sectoral trade unions. It must be noted here that these employment figures, almost without exceptions[I], include all employees regardless of their country of origin, and employment in fleets registered under both EU and other countries. Consequently, the employment figures are an over-estimation of employment generated for EU nationals or vessels registered under EU flags. Statistics also vary in a sense that in some countries the shipping sector workforce includes seafarers only, and in others seafarers as well as staff in support services and shipping companies on shore.

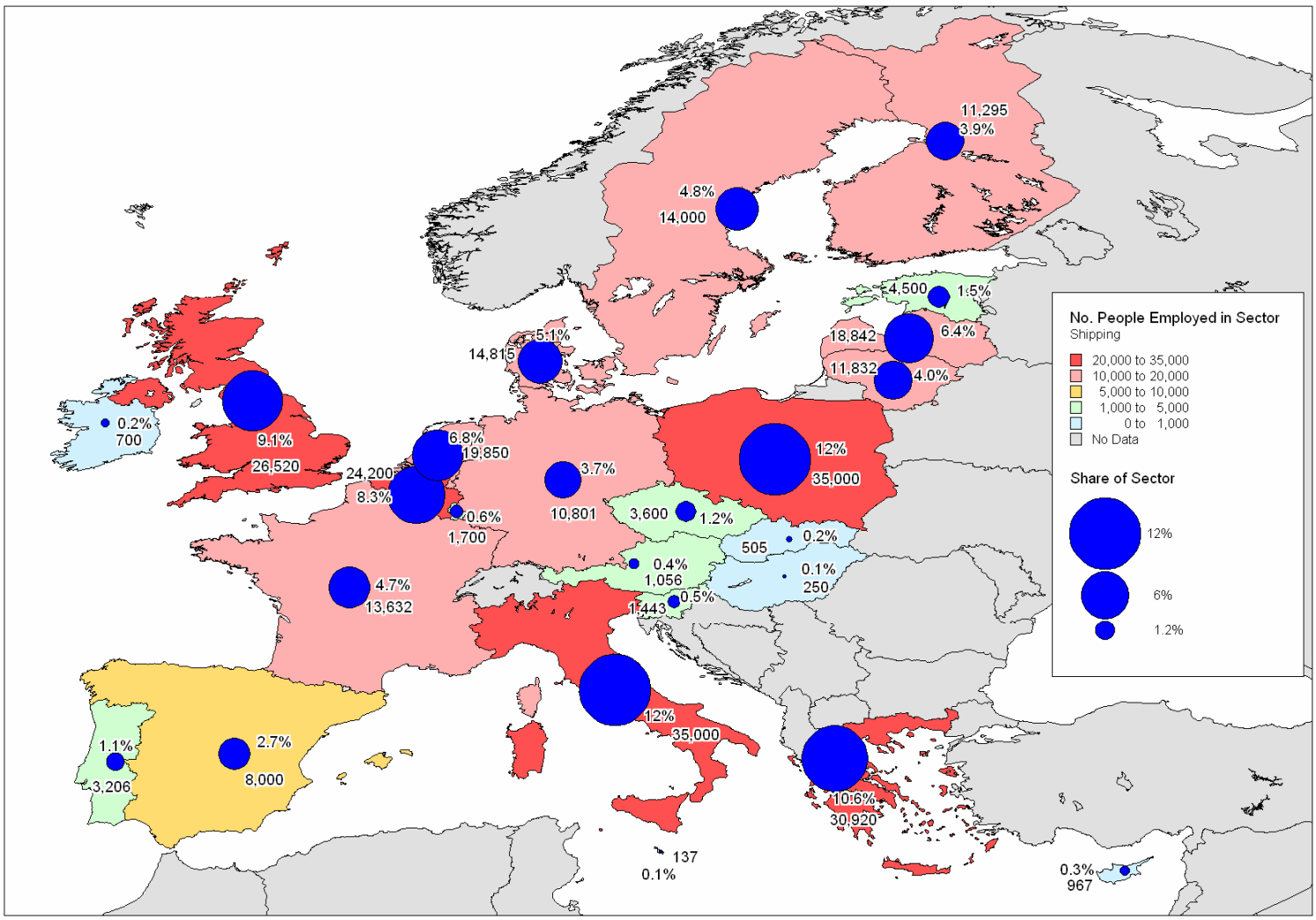
7.3 Employment trends

The maritime transport sector provided a total of 303,000 jobs for EU and non-EU nationals in 2004/2005[II] under EU, EEA and third country flags. This largely speaking reflects employment of seafarers working on-board (active seafarers) and those working in shipping companies ashore.

[I] Exceptions are the landlocked countries Luxembourg, Hungary, Austria, Slovakia and Czech Republic, and Malta, Portugal and Luxembourg.

[II] Includes 2004 figure for Belgium, Finland, Germany, Greece, Hungary, Ireland, Malta, and 2003 figure for the UK and 2002 figure for Sweden and Denmark.

Map 7.1 Employment in the shipping sector in EU-25[I]



Source: ECOTEC Research and Consulting, 2006 (individual sources identified in country reports)

General employment trends showed a picture of decline in employment. Estonia (-57%), Germany (-26%), Greece (-21%) and Poland (-22%) have witnessed some of the most dramatic reductions in employment. Employment has remained relatively stable in Belgium and Denmark and has increased in the Netherlands between 1997-2002 and gradually in Italy between 1997 and 2004. The Irish statistics also reveal that employment has increased over the past five years, but recent 'reflagging' plans of the largest Irish cruise company have started to convert this trend for 2005/2006. The UK situation demonstrates a longer term steady decline, but since 2001 the sector has displayed slight growth in employment due to successful government interventions. However, at the same time the share of British seafarers out of total seafaring population in the UK has declined.

[I] This map excludes employment in the Greek shipping companies – a total of 11,041 workers. The number of certified Maltese seafarers in 2005 was 119.

Table 7.1 Employment in the shipping sector, 1995 - 2005

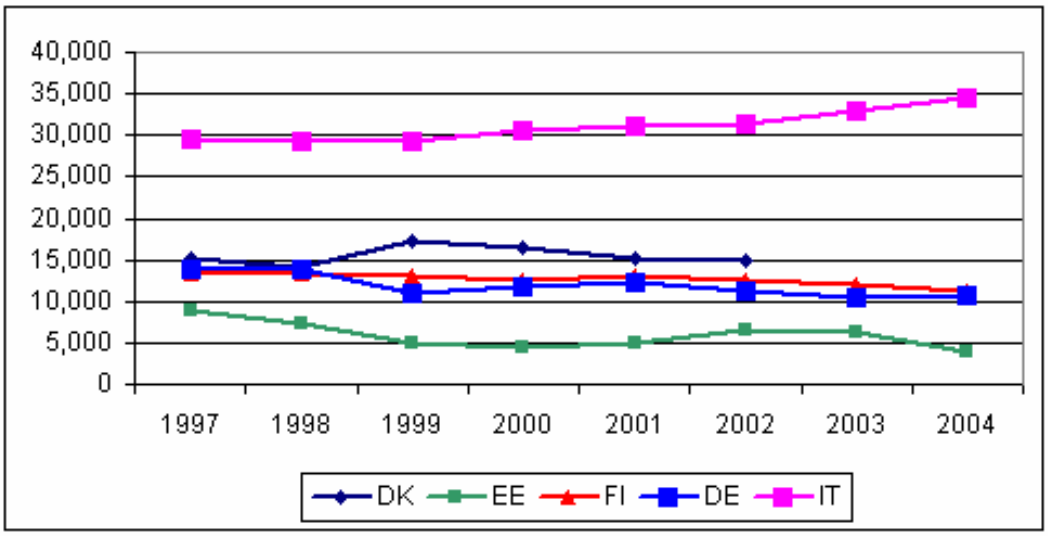
Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	-	-	-	-	-	-	-	-	-	1,056	-
Belgium - Direct - Indirect	 - -	 - -	 - -	 - -	 - -	 3,600 1,150	 - -	 - -	 - -	 3,600 1,160	 - -
Cyprus	-	-	-	-	-	-	-	-	-	-	24,200
Czech Rep	-	-	-	-	-	-	-	-	-	967	-
Denmark - Direct - Indirect	 - -	 - -	 15,068 4,219	 14,172 3,968	 17,371 4,864	 16,364 4,582	 15,251 4,270	 14,815 4,148	 - -	 - -	 - -
Estonia	-	10,400	8,800	7,400	4,900	4,400	4,900	6,600	6,200	3,900	4,500
Finland	12,238	12,267	13,212	13,412	13,183	12,545	13,055	12,597	12,049	11,295	-
France	-	-	-	-	13,674	-	13,632	-	-	-	-
Germany	14,606	-	13,774	13,804	10,861	11,838	12,216	11,207	10,542	10,801	-
Greece	39,122[I]	-	36,766	33,669	-	29,385	-	32,926	-	30,920 + additional 11,041 in shipping companies ashore	
Hungary	-	-	-	-	-	-	-	-	-	250	
Ireland	-	-	-	-	-	-	1,029	1,332	1,373	1,219	700
Italy total[II] - All flags - Italian fleet	38,260 -	37,210 -	29,600 -	29,200 -	29,400 -	30,600 -	31,000 -	31,450 -	32,990 35,000 27,200	34,480 -	 -
Latvia	-	-	-	-	-	-	-	-	-	-	18,842
Lithuania	-	-	-	-	-	-	-	-	-	-	11,832
Luxembourg	-	-	-	-	-	-	-	-	-	1,700	-
Malta	-	-	-	-	-	-	-	-	-	137	119
Netherlands - Direct - Indirect	 - 0-	 - -	 17,732 5,200	 - -	 - -	 - -	 - -	 19,850 5,500	 - -	 - -	 - -
Poland	-	-	-	-	-	-	45,000	45,000	-	-	35,000
Portugal	-	-	-	-	-	-	-	-	-	3,206	-
Slovakia	-	-	-	-	-	-	-	-	-	505	-
Slovenia	-	-	-	-	-	-	-	-	-	-	1,443
Spain - Direct - Indirect	 9,000 2,600	 - -	 - -	 - -	 - -	 8,500 -	 - -	 - -	 - -	 - -	 8,000 1,500
Sweden	-	-	15,000	-	-	-	-	14,000	-	-	

[I] Data for 1994.
[II] Based on data from Confitarma and Fitmarittimi.

UK	-	-	-	-	-	-	-	25,710	28,340	27,710	26,520

Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

Figure 7.1 Trends in employment, 1997-2004

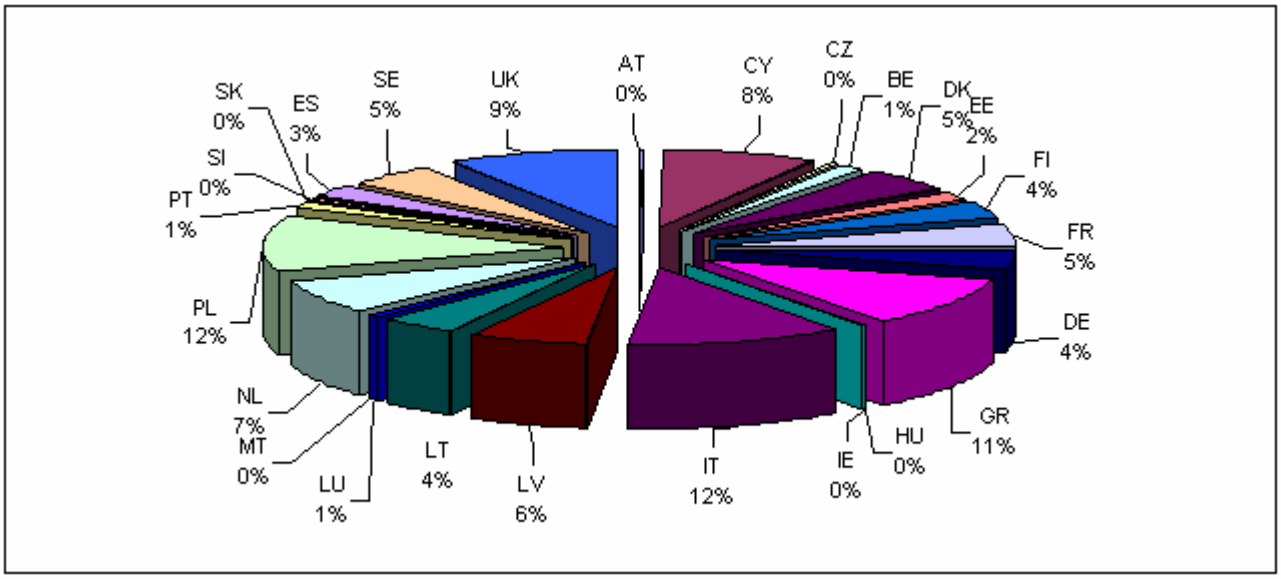


Source: ECOTEC Research & Consulting, 2006

As shown by the graph 7.1 below, Italy, Greece and Poland are the largest maritime nations in Europe in terms of the number of seafarers. Some 35,000 shipping sector workers registered in Italy in 2003 constitute approximately 12% of the total seagoing population in the European Union. Out of 35,000 active seafarers some 27,000 are working in vessels flying the Italian flag. Some 19,000 seafarers out of total 35,000 were of EU origin in 2003.

Poland also provides 35,000 jobs in European Union, on both vessels registered in Poland and/or under other flags. Greece follows Poland and Italy closely with nearly 31,000 seafarers (11% of the total shipping sector workforce in Europe), even though the Greek seafaring workforce has declined by a fifth (21%) between 1994 and 2004. Over the same time the proportion of foreign seafarers in the Greek fleet grew from 34% to 43%. The Greek shipping companies employ further 11,000 individuals ashore. Other important maritime nations are the United Kingdom making up 9% of total workforce, followed by Cyprus (8%), the Netherlands (7%) and Latvia (6%).

Figure 7.2 Share of employment in 2004/2005[I]



Source: ECOTEC Research & Consulting, 2006

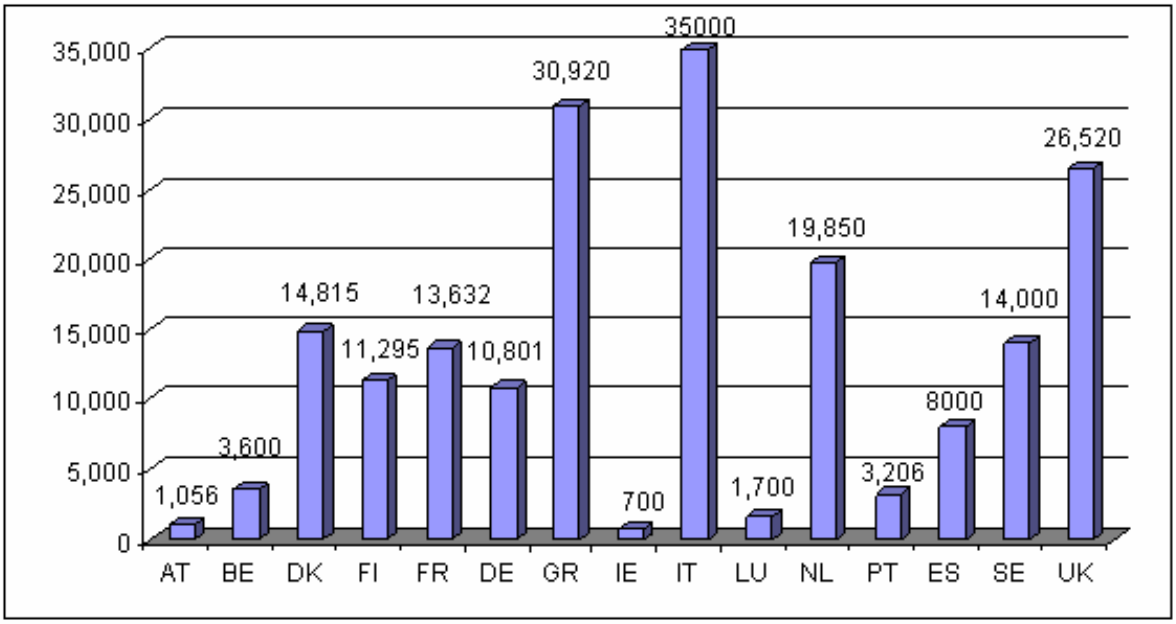
Figure 7.2 outlines the level of employment in the old Member States. Based predominantly on 2004/2005 figures[II], the sector provides some 195,000 jobs in the 15 'old' Member States. Denmark, Sweden, Greece and France are the largest seafaring nations after the key players of the industry (Italy, UK and the Netherlands). The Danish figure also includes staff working in shipping companies ashore, whilst the figures from countries like Germany and Finland only include seagoing members of staff.

The sector provides only marginal employment effect in the landlocked countries Austria and Luxembourg, in addition to Ireland and Portugal.

[I] The latest year available. The figure for Italy is from 2003; Denmark, Sweden and Netherlands from 2002; France from 2001

[II] Exceptions are for example the Netherlands and France where the figures come from 2002 and 2001, respectively.

Figure 7.3 The shipping sector workforce in the EU-15 2004/2005[I]



Source: ECOTEC Research & Consulting, 2006

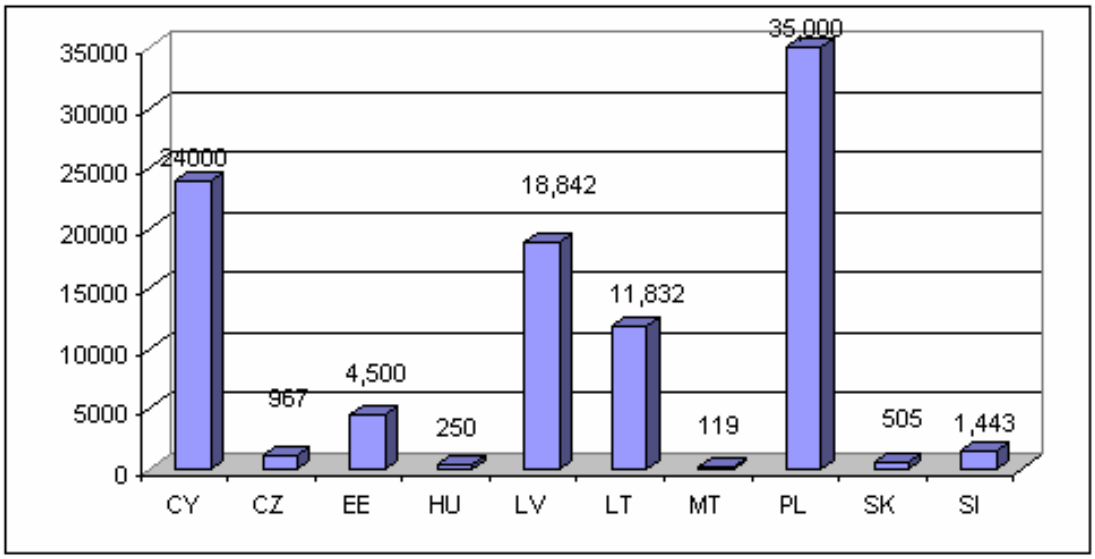
According to workforce statistics, the shipping industry is in relative terms a larger industry in the new Member States than in the old Member States. In 2004/2005 the sector employed some 97,500 individuals in / from the new Member States. The figures provided by the stakeholders for this study differ somewhat from the figures provided by the maritime authorities of the new Member States for ECSA on the number of registered seafarers. According to the information from the maritime authorities there were some 72,000 registered seafarers in 2004 in the 10 new Member States.

As already identified Poland has the largest seagoing workforce, followed by Cyprus and the three Baltic States. Each remaining country only employ 150 to 1,500 individuals in this sector.

The Cypriot fleet currently provides employment for 24,000 persons, even if only a marginal percentage of all seafarers are of Cypriot origin and approximately a further 7,200 are other EU nationals. Nevertheless, a majority of shore based employment is occupied by nationals (e.g. 81% of shipping related employment ashore is taken by natives in Cyprus). The Baltic States are also comparatively important players in the industry, especially when considering the sizes of the countries. But for example in the case of Lithuania, only 2,000 of the nearly 12,000 Lithuanian seafarers were employed on Lithuanian vessels[II].

[I] The latest year available. The figure for Italy is from 2003; Denmark, Sweden and Netherlands from 2002; France from 2001. This graph excludes employment in the Greek shipping companies – a total of 11,041 workers.
[II] Lithuanian Seafarers Register.

Figure 7.4 Employment in the shipping sector in the 'new' Member States in the EU-15 2004/2005[I]



Source: ECOTEC Research & Consulting, 2006

The following table provides information on the supply of officers and ratings in the EU countries, based on the survey carried out by BIMCO/ISF. It shows that whilst the supply of officers has increased over the past decade in the EU countries, the supply of ratings has declined. This confirms the overall trend, as discussed earlier, that the labour market for seafarers, particularly ratings that has continued to shift from the traditional maritime countries of Western Europe, Japan and North America towards the Far East, Indian sub-continent and Eastern Europe.

[I] The latest year available.

Table 7.2 Supply of officers and ratings in Europe 1995-2005

Country	1995			2000			2005		
	Officers	Ratings	Total	Officers	Ratings	Total	Officers	Ratings	Total
Austria	397	711	**1,108**	n.a	n.a	**n.a**	n.a	n.a	**n.a**
Belgium	876	419	**1,295**	546	133	**679**	498	92	**590**
Cyprus	n.a	n.a	**n.a**	50	1,950	**2,000**	1,600	2200	**3800**
Czech R.	206	483	**689**	n.a	n.a	**n.a**	n.a	n.a	**n.a**
Denmark	5,600	5,700	**11,300**	5,353	4,522	**9,875**	5488	4166	**9654**
Estonia	1,670	2,330	**4,000**	2,152	7,000	**9,152**	3684	6253	**9937**
Finland	2,020	2,850	**4,870**	4,000	6,000	**10,000**	2000	4500	**6500**
France	2,210	3,200	**5,410**	2,030	4,300	**6,330**	2983	6757	**9740**
Germany	8,391	6,589	**14,980**	6,021	8,462	**14,483**	4800	1850	**6650**
Greece	22,000	18,000	**40,000**	17,000	15,500	**32,500**	17000	15000	**32000**
Hungary	245	415	**660**	782	1,243	**2,025**	782	1243	**2025**
Ireland	1,452	2,089	**3,541**	1,452	2,089	**3,541**	1452	2089	**3541**
Italy	14,500	17,800	**32,300**	9,500	14,000	**23,500**	9560	11390	**20950**
Latvia	6,170	8,135	**14,305**	6,170	8,135	**14,305**	7515	10027	**17542**
Lithuania	n.a	n.a	**n.a**	n.a	n.a	**n.a**	365	654	**1019**
Luxemb.	655	595	**1,250**	514	465	**979**	470	435	**905**
Malta	n.a	n.a	**n.a**	n.a	n.a	**n.a**	n.a	n.a	**n.a**
Netherl.	6,097	1,686	**7,783**	5,707	5,937	**11,644**	3858	1002	**4860**
Poland	5,500	6,500	**12,000**	5,944	6,162	**12,106**	8446	4737	**13183**
Portugal	764	2,404	**3,168**	419	1,802	**2,221**	419	1802	**2221**
Slovakia	37	67	**104**	37	68	**105**	258	318	**576**
Slovenia	n.a	n.a	**n.a**	140	185	**325**	544	100	**644**
Spain[I]	4,626	7,717	**12,343**	4,367	6,546	**10,913**	4000	6000	**10000**
Sweden	4,462	4,980	**9,442**	4,500	5,100	**9,600**	4892	8927	**13819**
UK[II]	1,200	12,575	**16,275[III]**	13,385	10,935	**24,320**	14150	4575	**18725**
Total	**89,078**	**105,245**	**196,823**	**90,069**	**110,534**	**200,603**	**94,764**	**94,117**	**188,881**

Source: BIMCO / ISF Manpower Studies 1995 - 2005

[I] Includes Canary Islands
[II] Includes Isle of Man
[III] Includes also 2,500 seafarers employed on Royal Fleet Auxiliary services

7.4 Factors affecting employment

Employment in the shipping sector is affected by many different factors. One of the most significant factors affecting employment in this sector in the EU in the upcoming years is the ageing profile of the EU national workforce, and at the same time the poor image of the sector resulting in low numbers of young people taking up education or training in this field and low attractiveness caused by long absences away from home. Indeed, these factors present a real threat for the European shipping industry. Currently, over 25% of officers from OECD countries are over 50 years old, and well over 50% are over 40. The impact of their retirement, without adequate numbers of well trained and experienced replacements, can be severe[I]. Member State responses to these challenges are discussed in the policy section of this report.

Another key factor affecting employment in this sector is the growing number of non-EU nationals on board of the EU fleet, together with concerns from the trade unions on the quality of and equality in employment. Information from ECSA on employment based on nationality confirms the trend of declining proportion of seafarers from EU countries (see table 8.3). According to these statistics, whilst employment of seafarers from the EU-15 slightly declined between 1996 and 2001/2002, the number of seafarers of non-EU/EEA origin increased by 19%[II]. It is however worth mentioning that the figures for non-nationals also include employment of Eastern European seafarers, many of whom are EU nationals now.

If we analyse the situation in 2001/2002 more closely, the non-nationals made up over half of the seagoing workforce in Belgium and Portugal and there we nearly as many non-nationals than nationals registered in the Netherlands. On the other hand, foreign seafarers made up only a marginal share of the seafaring workforce in Finland and Sweden. These statistics also show that non-EU/EEA nationals constitute a substantially larger share of ratings positions than officers; officer posts are generally held by EU nationals. According to these data, just under a third of all seafarers in two of the greatest shipping nations, Italy and Greece, were of foreign origin in 2001/2002 (32% and 29% respectively). According to the Danish Shipowners Association, between 1995 and 2005 the number of Danish seafarers has decline by around 900, whilst the number of other EU/EEA nationals more than doubled from 700 in 1995 to nearly 1,500 in 2005. The number of seafarers from outside EU/EEA has also increased, although not at the same rate as the number of EU/EEA nationals. Due to the historic seafaring traditions of the former Soviet Union approximately 70% of Latvian seafarers have their origins either in

[I] BIMCO/ISF Manpower study, 2005.
[II] On the basis of available statistics.

Russia, Belarus or the Ukraine[I]. Foreign seafarers hold lower ranking positions in particular, as showed by the Social Issues Research Centre's research on the UK shipping sector. According to this study some 70% of all masters on British-registered ships are UK nationals, the figure falls to 54% for chief engineer officers, 37% for chief officers and just under 33% of second officers.

Table 7.3 Employment of seafarers, 1996 – 2001/2002

Country		1996		2001-2002	
		National	Non-National	National	Non-National
Belgium	Officers	-	-	-	-
	Ratings	1.146	356	-	-
	Total	**-**	**-**	**324**	**490**
Denmark	Officers	-	-	5,611	601
	Ratings	-	-	3,905	3,516
	Total	**9,050**	**2,700**	**9,516**	**4,117**
Finland	Officers	-	-	2,100	-
	Ratings	-	-	5,260	40
	Total	**7,758**	**27**	**7,360**	**40**
France	Officers	-	-	2,851	419
	Ratings	-	-	6,454	1,410
	Total	**9,069**	**1,050**	**9,305**	**1,829**
Germany	Officers	-	-	4,631	970
	Ratings	-	-	3,155	3,471
	Total	**9,370**	**4,803**	**7,786**	**4,441**
Greece	Officers	-	-	7,423	*430
	Ratings	-	-	9,779	*6,733
	Total	**22,556**	**8,193**	**17,202**	**7,163**
Ireland	Officers	-	-	-	-
	Ratings	-	-	-	-
	Total	**751**	**329**	**1,029**	**405**
Italy	Officers	-	-	-	-
	Ratings	-	-	-	-
	Total	**25,300**	**4,500**	**17,500**	**8,300**
Netherlands	Officers	-	-	6,642	2,338
	Ratings	-	-	2,294	5,832

[I] Southampton Solent University (2005) The mapping of career paths in the maritime industries. ECSA and ETF,

Country		1996		2001-2002	
		National	Non-National	National	Non-National
	Total	**7,659**	**3,436**	**8,936**	**8,170**
Portugal	Officers	-	-	229	507
	Ratings	-	-	342	761
	Total	**850**	**300**	**571**	**1,268**
Spain	Officers	-	-	2,400	-
	Ratings	-	-	4,300	-
	Total	**6,800**	**10**	**6,700**	**-**
Sweden	Officers	-	-	4,350	100
	Ratings	-	-	8,700	600
	Total	**9,630**	**-**	**13,050**	**700**
United Kingdom	Officers	-	-	10,800	-
	Ratings	-	-	9,700	-
	Total	**11,815**	**5,287**	**20,500**	**-**
TOTAL		**121,754**	**30,991**	**119,779**	**36,923**

Source: ECSA and national ship-owner associations

European regulations and regimes, and the extent to which individual Member States respond to them, have also had a strong influence on employment in the shipping sector. From the European perspective, the first guidelines on state aid to maritime transport from the European Commission were issued in 1989 to ensure convergence between actions of Member States in the sector and to reverse the decline in Community fleet. However, the guidelines were found to be ineffective in solving the problem of open registers; consequently they were reviewed in 1997. This review resulted in a package of measures to allow Member States to address issues dealing with ship-owners' fiscal needs and the offset social costs associated with seafarers (including, tonnage tax schemes, reduced fiscal and social security contributions for Community seafarers, training and state aid for the repatriation of EU seafarers). The following table demonstrates the varying degrees to which different Member States have 'exploited' these European guidelines to improve competitiveness of their shipping industries. For example, in order to discourage ship-owners from registering their ships under foreign flags, 11 European countries have adopted a tonnage tax with the aim of more ship owners registering ships with European countries.

Table 7.4 Measures adopted by the Member States

	Manning	Seafarers taxes	Tonnage tax	Reserves	Others
Belgium	X	X	X	X	X

Cyprus					
Denmark	X	X	X	X	X
Estonia					
Finland		X	X		X
France	X	X	X	X	X
Germany	X	X	X	X	X
Greece	X	X	X		
Ireland			X		X
Italy	X	X	X	X	
Latvia					
Lithuania		X			
Luxembourg	X	X		X	X
Malta					
Netherlands	X	X	X	X	X
Poland					
Portugal		X		X	X
Slovenia					
Spain		X	X	X	X
Sweden	X	X			
United Kingdom	X		X	X	

Source: European Shipping Policy, 2004

In 2003, the impact of these guidelines was reviewed - with the finding that those countries that had implemented the aid measures had seen a considerable growth of tonnage returning to the national flags and substantial growth in the volume of cargo in the EEA countries (50% growth in 2003 compared to 2002). Although overall employment declined during this timeframe on EU Member State flagged vessels, this was largely seen a result of improved vessel productivity. Tonnage schemes, however, have been argued to have safeguarded employment on board, and in some cases increased the number of seafarers (e.g. Belgium) when they have been implemented together with associated measures. Anecdotal evidence shows increases in high-quality employment on-shore as a result of introduction of tonnage tax regimes, such as management of shipping and insurance, brokerage and finance (e.g. in the case of UK).

The review resulted in the retention of the 1997 guidelines in terms of investment, training and repatriation but changes were made to state aid programmes for ship owners and labour aid packages. In addition, public support to short sea shipping was introduced.

Most of the Member States are also affected by the fact that employment in the sector is no longer seen as an attractive career option by young people. The sector has received bad press in some countries with detrimental impact on the image of the sector (e.g. Greece) and often the sector suffers from an image of being 'old-fashioned and hard work' with young people lacking knowledge about today's high-tech vessels. For example, the growth in the short sea shipping sector demands new skills; ship manoeuvres are becoming more complicated and need to be faster which requires in-depth knowledge of new computer and electronic systems. This information about the changes in the job profile of a seafarer as an increasingly technical and skilled profession has not reached young people in many countries and many maritime schools across Europe have seen severe declines in the number of young people choosing to study maritime related studies. For example, in Latvia the number of new certificates issued for seafarers has gone down from over 15,000 certificates in 2002 to just 9,500 certificates in 2005. In Finland the maritime schools have witnessed a decline of 33% in the number of young people applying for maritime related studies. On the other hand, as a result of greater investment in marketing, the image and reputation of the sector are improving and registrations for maritime studies are on the increase in Belgium.

Other factors affecting employment in the sector are salaries, labour migration and availability of training. In Latvia the salary rises in the shipping sector have been fairly low and Italy the sector has suffered from the lack of publicly-funded training. Some of the new Member States have suffered from labour migration with people moving to work in foreign vessels with substantially higher salaries. Whilst the sector used to be highly paid in Poland, nowadays the average monthly pay of a seafarer equals the average monthly salary in Poland. In Latvia young people have started to view that shore based jobs give better opportunities for career development.

The shortage of officers is also of a growing concern the European shipowners who are finding it increasingly difficult hire to senior crew members. This is fuelled by the declining number of young people choosing maritime related studies, the ageing profile of officers and low retention rates. According to BIMCO/ISF 10% of trainee officers drop-out before they qualify. These trends also have an impact on the maritime sector as a whole because traditionally ex-seafarers have held important positions in port administrations and other maritime related professions onshore.

Another concern for the industry is the career progression from sea based employment to a career ashore. The process of progressing to a career ashore is different for deck officers who often find it more difficult to find shore based employment than engineering officers would seek for opportunities in well defined areas where their skills are in demand. The main reason for decreasing opportunities for deck officers is the greater integration of

the ships agencies, ports, ship brokerage and freight forwarding businesses into wider logistics industry, which has resulted in greater detachment of that sector from seafaring. Engineer officers are widely sought after in such professions as inspectors and surveyors with shipping, management, classification and insurance companies, as well as in operational functions with shipping and management companies, shipyards and engine manufacturers, etc.

The study by ECSA and ETF on career progression in maritime sectors argues that former officers make attractive employees in shore based professions and progress from the middle to top middle management. However, due to the general lack of management or business qualifications, very few progress further. It is difficult to assess whether the lack of qualifications is the primary cause of the lack of progression of the ex-seafarers into top management. One important factor may be different scope of management responsibilities at sea (that focus on technical and operational functions) and current qualifications of top management with predominantly financial and commercial backgrounds.

7.5 Employment forecast

The global seaborne trade has been predicted to grow steadily with an average annual growth of 3-4% over the next decade. As a direct consequently, despite efficiency gains, shipping sector stakeholders who were interviewed for this study have forecast a growing demand for qualified seafarers – at least for the next decade. At the same time it is a well documented fact that the number of active EU seafarers is in decline. This study for example already highlighted some dramatic declines in seafaring workforce in some of the Member States (e.g. Estonia, Greece and Germany) and the growing share of non-EU seafarers. This trend is further fuelled by the ageing profile of officers from the EU-countries and the low attractiveness of the sector among young people in Europe (as evidenced above). BIMCO/ISF have stated that the growing demand for qualified seafarers will only be met if the increase in levels of recruitment and training is maintained and if wastage/turnover rates are reduced. In terms of efficiency gains and impact on employment, it is argued that there is little scope for further manning reductions, since international requirements, such as working time regulations and the ISPS Code, together with commercial demands, have increased the workload on board.

In future EU countries will continue to remain an important source of officers, although over the past years Eastern Europe has become increasingly significant with a large increase in officer numbers. In the global scale, the Far East and South East Asia, and the Indian sub-continent remain the largest sources of supply of ratings and are rapidly also becoming a key source of officers.

Despite projected increases in the volume of cargo traffic in Europe, the forecasts for employment vary from country to country. The following table summarises some projected trends from a selection of Member States.

Employment forecasts for seafarers in the EU Member States

- Even though the Estonian shipping sector has experienced severe decline over the past decade, shipping companies believe that stability has now been achieved, and employment is expected to increase in the near future due to developments in the tourism sector and the construction of new harbours.

- The Belgian stakeholders believe that without the introduction of the tonnage tax, employment and added value in the Belgian shipping sector would have dropped drastically. Additional employment supporting measures also played an important role in this. Instead, since 2001 employment has been showing a clear positive trend. And if the policies are developed further, employment can be expected to continue grow in the future, but if the government does not take action to develop the current policies further, the number of Belgian seafarers may begin to decline again. It has been estimated that in 2020 there will be only 3,000 Belgian seafarers left if nothing is done[I].

- The labour market for Polish seafarers has been found to be faced with two contradictory trends. On one hand, there is a growing demand for highly trained and experienced officers in and outside the EU, but on the other hand there is a declining number of Polish seafarers employed on the EU-flagged ships due to fears of the ship owners of rising employment costs and claims from the trade unions. But the demand for higher skilled, specialised seafarers is likely to increase but on the other hand the attractiveness of the sector is likely to diminish in the future. Whilst the sector used to be highly paid, especially during the communist regime, nowadays the average monthly pay of a seafarer equals the average monthly salary in Poland.

- The Italian seafarers' union has estimated that the sector has a growth employment potential of 5 - 10% annually[II]. However, as the sector is facing a labour shortage it is expected that growth in employment would be absorbed by foreign rather than Italian seafarers.

- The future of the Irish shipping sector employment looks dark at the moment, due to the recent news from Irish Ferries to reflag their vessel.

- Although the number of individuals employed on board vessels under a German flag has increased in recent years as a result of government measures, the number of German seafarers is likely to continue to decline in the future. Trade unions would like to see stronger enforcement of existing requirements of equal treatment of seafarers. Ver.di in particular points to a new agreement on global working conditions for seafarers.

- Some 200 ships have recently been ordered by the Danish ship owners suggesting that there is an optimism about the sector. If a significant proportion of these new ships fly the Danish flag, it could potentially have a positive impact on employment in the sector.

[I] Policy Research Corporation (2001 and update 2004) *Economic impact study Belgian shipping cluster*
[II] Fitmarittimi

- The Greek stakeholders have confirmed that unless drastic action is taken to provide the Greek young people with motives to attract them to the shipping sector, employment in the sector will continue to decline – particularly employment of Greek nationals.

- According to the Swedish Shipowners' Association much of the future of the sector is dependent on the introduction of a tonnage tax. Without a tonnage tax, the Swedish Shipowners' Association fears that conditions for Swedish shipping companies will not be internationally competitive. But there were 60 confirmed orders for vessels by Swedish shipping companies in December 2005 and the Swedish Shipowners' Association suggests that if all of these 60 vessels would register under the national flag, there would be an estimated increase in employment of some 7,200 seafarers[l]. They also estimated that only half of the 60 vessels in order will fly the Swedish flag. Thus, reducing the possible employment impact to some 3,500 people.

- The Finnish seafarers' union believe that Finnish vessels will start registering under the Swedish flag if the Swedish tonnage tax will be introduced and implemented successfully.

Finally, the number of seafarers in the EU maritime cluster is likely to increase if the two candidate countries Romania and Bulgaria are to join the EU in 2007. The Bulgarian Maritime Administration has confirmed that in 2004 Bulgaria had 21,727 registered seafarers and the Romanian Naval authority has reported that there were 8,467 registered seafarers in 2004 from Romania.

[l] As a rule of thumb, an offshore employee contributes to the employment of 5-6 people onshore. Thus, an average onboard crew of 20 people (corresponding only to the security staff) on 60 vessels would lead to a total employment effect of 7,200 (20*60*6=7,200).

8.0 Offshore oil and gas extraction

Offshore oil and gas extraction as a part of the maritime cluster refers to the construction, installation and conversion of platforms, storage vessels and equipment; drilling and off-shore related transport, engineering, communication, consultancy and other support.

Some 35% of global oil production and 27% of gas production is from offshore supply[I]. Compared to other marine industries offshore oil and gas extraction is the world's largest marine industry in terms of value of output and third largest after shipping and marine tourism as a market[II]. However, after nearly 40 years of production, Europe has become a mature region and is now entering an irreversible long-term decline. Indeed, in the UK average production per field has decreased from 112,000 barrels per day in 1979 to 13,000 in 2003[III]. There could, however, still be some significant discoveries in Europe and as the major oil companies are leaving the North Sea, there are considerable opportunities for small companies. In addition, there are many prospects for new entrants to acquire existing 'brownfields' from the existing major oil companies[IV].

Norway and the UK currently account for a considerable share of total offshore oil and gas production and it is expected that they will account for 86% of expenditure in the next five years. Denmark, Italy and the Netherlands together largely account for the remaining share[V]. Although a small producer itself, Germany is an important provider of technology to the industry. Similarly, France has developed a major oil and gas service industry without its own offshore production. Indeed, over the last 20 years European equipment and service suppliers in the oil and gas industry have built up a 30% world market share from almost nothing.

8.1 Economic impact

European expenditure[VI] was €19 billion in 2004 and the UK alone accounted for more than 40% of this[VII]. Around 80% of the oil and gas production is exported[VIII]. The economic contribution of the industry is further emphasised by the UK experience where offshore oil

[I] Marine Industries Global Market Analysis (2005) Douglas-Westwood
[II] Ibid.
[III] Marine Industries Global Market Analysis (2005) Douglas-Westwood
[IV] World Marine Markets (2005) Douglas-Westwood
[V] Ibid.
[VI] Total capital and operational expenditure (not the value of the offshore oil and gas production which is considerably greater)
[VII] Marine Industries Global Market Analysis (2005) Douglas-Westwood
[VIII] EUROGIF (2006)

and gas is the single most important contributor to the industrial sector of the UK economy both in terms of its contribution to economic activity.

8.2 Availability of employment data

Employment related to offshore oil and gas sector has only been studied as a part of the maritime sector employment in Denmark and the Netherlands. As a result, the provision of a realistic projection of employment in this sector in Europe is difficult without more detailed statistical collection at national level. Data collection for the sector is further complicated by the fact that the it also comprises manufacturing of offshore platforms and other equipment. Employment from these activities is often classified under the shipbuilding or marine equipment sectors, or indeed under other manufacturing sectors. Germany, for example, is one of the key produces of technology to the industry but the level of employment in this field is difficult to estimate.

8.3 Employment trends

Employment in the European oil and gas sector declined significantly throughout most of the 1990's and into the 21st century. However, since 2001 employment has picked up again. There is currently no data available for the EU-25, though in 2005 it was estimated by EUROGIF that the oil and gas service industry in Europe (EEA) employed some 250,000 workers directly and around 500,000 indirectly. These figures, however, include direct employment in Norway, which was estimated at 50,000 in 2005. Thus, employment in the EU-25 is more likely to be in the region of 200,000 (600,000 when including indirect employment). It is difficult to determine how much of this employment is *offshore*, though in the countries represented in the table above, direct offshore employment amounted to nearly 81,000 in 2005[I].

Table 8.1 Employment in the oil and gas extraction

	1990	1998	1999	2000	2001	2002	2003	2005
UK	**382,000***	**359,000****	**270,000**	**-**	**265,000**	**-**	**-**	**260,000**
- direct	36,000	-	-	19,000	-	-	-	30,000
- indirect	-	-	-	-	-	-		230,000
Denmark	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
- direct	-	1,180	1,337	1,437	1,287	1,287	-	-
- indirect	-	2,021	1,921	1,871	2,374	2,234	-	-
Finland	**-**	**-**	**-**	**572**	**644**	**775**	**695**	**661**

[I] The figures for Denmark and Netherlands are from 2002.

	1990	1998	1999	2000	2001	2002	2003	2005
France	**-**	**19,000**	**17,500**	**17,000**	**24,000**	**25,200**	**-**	**25,600**
Lithuania	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3,514**
Netherlands	**-**	**32,940****	**-**	**-**	**-**	**32,520**	**-**	**-**
- direct	-	19.340**	-	-	-	19.080	-	-
- indirect	-	13.600**	-	-	-	13.440	-	-
Poland	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**475**
Europe (EEA)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**750.000**
- direct	-	-	-	-	-	-	-	250.000
- indirect	n/k	n/k	n/k	n/k	n/k	n/k	n/k	500.000

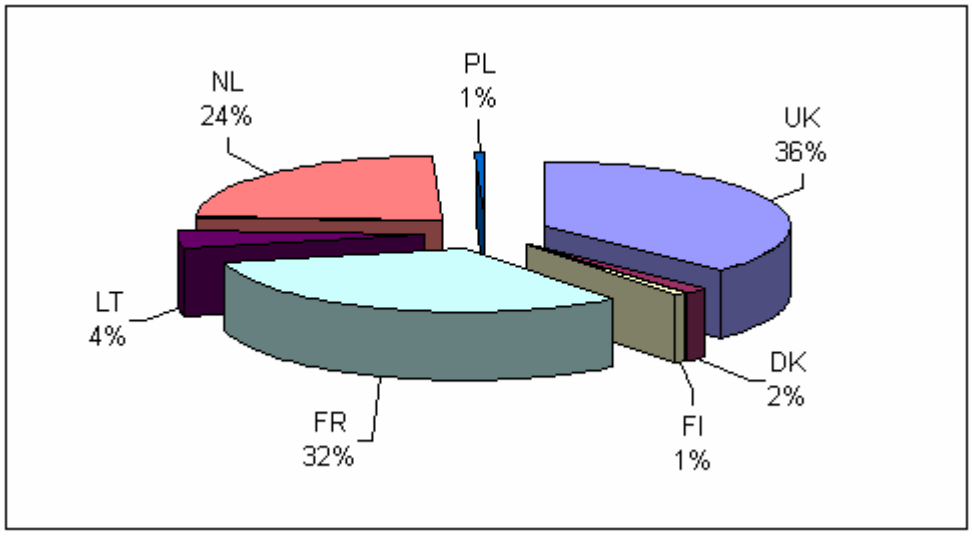
*Source: UKOOA, 2006; Sornn-Friese, 2003; French Maritime Related Economic Data 2003, Ifremer; *1995; **1997*

In the UK, total employment in the oil and gas industry has fallen significantly since 1995 – from 382,000 to 260,000. Employment at UK offshore fields was nearly halved between 1990 and 2000, but since then the industry has recovered and in 2005 30,000 were directly employed by exploration and production companies. In addition to direct employment, the UK oil and gas industry also contributed to the employment of 155,000 persons through supply chain linkages and 75,000 through induced effects arising from the investment and wages from the industry.

In Denmark, employment in offshore oil and gas extraction has remained relatively stable since the early 1990s. Indeed, since 1990 employment has fallen by less than 4%. Notably, employment fell significantly between 1995 and 2000 but has since then recovered. In France, a total of 61,000 people are employed in the oil and gas industry, of which nearly 26,000 are employed in the offshore sector. Compared to 2000 employment has increased with some 5%.

When looking at the share of employment for different European countries, it is clear from the graph 8.1 below that the offshore oil and gas industry is by far the largest in the UK, France and the Netherlands. The UK is home to over a third of all employees from the sector, and nearly another third of all jobs are located in France. The Netherlands is also a fairly significant player in this industry with a quarter of total employment. Germany is also an important player in offshore engineering but this employment data is included in the employment figures for shipbuilding / marine equipment sectors.

Figure 8.1 Share (%) of employment by country



Source: ECOTEC Research & Consulting, 2006

8.4 Employment projections

The sector has been experiencing a long-term decline in employment. But future employment trends will largely depend on how successful European companies will be at finding new oil fields. Given that more and more of the oil fields are discovered in deeper waters, this will require the development of new tools for installation and extraction, which in turn will require substantial investment in R&D. However, there is potential to increase employment in the manufacturing side if it is sufficiently supported by high level research and development.

A positive development for the sector is also the fact that the United Kingdom is increasingly seen as a global centre for the oil and gas industry. It is home to a wide variety of Exploration and Production (E&P) companies ranging from small independent companies to multinationals, mainly located in Scotland or in South East Asia.

However, a major obstacle for the sector is the shortage of skilled labour that has been reported by sectoral representatives[I]. This is despite the fact that the status of the UK as a leading centre for the oil and gas industry has developed from the country's recognised, strong skills base.

[I] International Association of Oil and Gas Producers, 2006.

9.0 Maritime services

The maritime service sector is a sector currently lacking European/global recognition as a maritime sector of its own. Having said that, London is widely seen to be at the heart of this sector because of the strong presence of major international organisations such as the IMO, Lloyd's insurance and the Baltic Exchange. This presence leads to Europe's top global position for the maritime service sector with London as the hub for the capital and expertise for marine insurance, ship-chatering, shipping finance, ship classification, legal services, dispute resolution and accountancy services. In addition, there are a wide range of other facilities, including education and training, publishing, event organisation, research and technical and engineering consultancy located in different EU member states.

The World Marine Market study by Douglas-Westwood (2005) divides the sector into three key clusters: maritime commerce, education & training and research & development. In this study the maritime service sector is defined as consisting of the following segments:

- Maritime related research and development: with sub sectors related to shipbuilding and marine equipment, as well as to the oil and gas sector and academic and government based R&D work.
- Maritime education and training: marine-related education and training of personnel employed in the marine sector. This sub-sector has three primary activity areas; seafarers' training, offshore workers' training and higher education.
- Ship classification and inspection: employment related to the survey and inspection of vessels to establish their compliance with regulations.
- Support services for the marine cluster (bunkering, ship supply, rescue, diving)
- Commercial activities, such as maritime insurance, financing, brokerage, law and consultancy.
- Medical services
- Coast guard
- Crewing agencies
- Maritime associations (e.g. shipowners' associations)
- Maritime government services (e.g. ministries, maritime authorities, European Commission etc.)

9.1 Economic impact

From the economic perspective the maritime services market shows a trend of long-term growth. The World Marine Market study by Douglas-Westwood (2005) has valued the economic significance of the sector for marine commerce activities and R&D.

In 2005, the value of the marine commerce sector in Europe was €2239million (€5.7billion being the global value) and it is expected reach €2278million by 2010[I]. However, the European forecast is less positive in global terms as the value of the global marine service industry market is expected to be €6.502million in 2010. It has also been estimated that London and Western Europe together account for 38% of the world marine commercial service market, followed by Asia with 24%. Altogether maritime commercial services in London employ over 14,000 people and generate £1,092m in overseas earnings.[II] The major contributors to the UK's £1,092m net overseas earnings of maritime services in 2002 were the Baltic Exchange (£322m), insurance brokers (£170m), legal services (£190m) and banks (£150m). The Lloyd's Register of Shipping and publishing also make an important contribution to the UK economy.

The maritime related R&D sector has been estimated to have a value of €3136 million in 2005 and this has been projected to reach €3522 million by 2010[III].

9.2 Data availability

As indicated above, the maritime service sector is not widely recognised as its own sub-sector in the maritime cluster. Employment for this sector has only been researched in more detail in the UK, France and the Netherlands. If one was to include data from these countries only, it would not be possible to provide a picture of maritime service employment in Europe as a whole – even if the UK is the heart of the sector both in European and global terms.

As a result, even though the aim of this study has been only to gather data from existing studies and from maritime sector stakeholders, researchers have contacted individual key organisations from the maritime service sector in most of the study countries in order to obtain further information on employment in this sector. These statistics which have been collected as a part of this exercise by no means provide a full or a complete projection of total employment in this sector, but they provide a basis for the assessment of employment in this sector. Further data collection for this sector is strongly recommended.

9.3 Employment trends

On the basis of available data, employment in the sector amounted to 88,000 in 2004/2006[IV]. Both indirect and direct maritime service employment in the Dutch maritime

[I] Douglas-Westwood (2005) World Marine Markets.
[II] *Maritime Services,* 2003, International Financial Services, London
[III] Ibid.
[IV] Figures for Spain and Cyprus are from 2004; Poland from 2003; Netherlands from 2002 and France from 2001.

cluster witnessed a slight increase of 670 jobs between 1997 and 2002. In the UK, the overall level of employment in the marine commerce segment of the industry marginally declined between 2000 and 2005. This has been claimed to reflect an improved efficiency and expertise of many organisations, rather than a declining demand for maritime services.

Table 9.1 Employment in the maritime services sector, 1997 – 2004

Country	1997	2000	2001	2002	2003	2004	2005/6
Cyprus[I]	-	-	-	-	-	116	-
Estonia[II]	-	-	-	-	-	-	312
Finland	-	-	-	-	-	-	1,657
France	-	-	11,041	-	-	-	-
Germany	-	-	-	-	-	-	13,720
Greece							9,961
Ireland	-	-	-	-	-	-	210
Italy	-	-	-	-	-	-	1,477
Latvia	-	-	-	-	-	-	3,243
Lithuania	-	-	-	-	-	-	1,738
Luxembourg[III]	-	-	-	-	-	-	136
Netherlands - Direct - Indirect	 9,080 3,700	 - -	 - -	 9,560 3,890	 - -	 - -	 - -
Poland	-	-	-	-	3,185	-	-
Slovenia	-	-	-	-	-	-	150
Spain	-	-	-	-	-	1,562	-
Sweden	-	-	-	-	-	-	2,401
UK[IV]	-	14,500	-	-	14,200	14,062	27,402
EU Institutions[V]	-	-	-	-	-	-	575

Source: ECOTEC Research & Consulting, 2006 (individual sources identified in country reports)

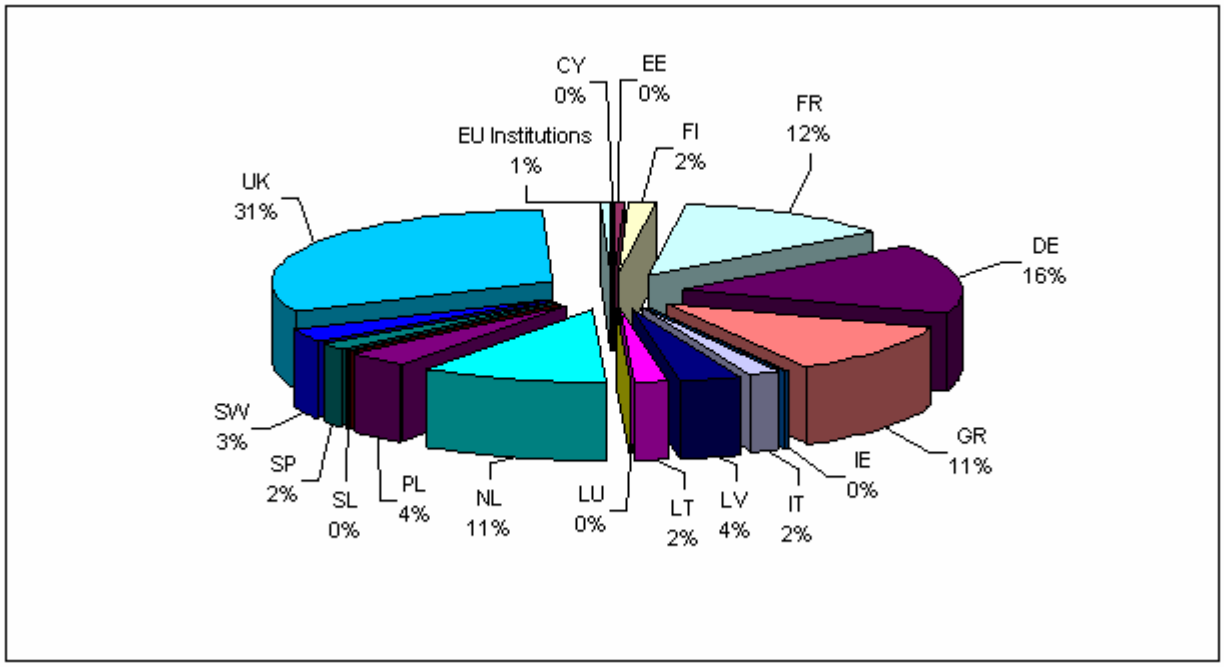
London and the UK are the hub of the sector in Europe not only in terms of the range of services but also in terms of employment. The UK hosts nearly a third of all maritime service related jobs in the EU. Just over 14,000 people are employed in marine commercial services only, of which 4,200 are in ship-broking and a further 3,150 in

[I] Public sector maritime employment only.
[II] Only relates to maritime education.
[III] Includes shipping agencies too.
[IV] The first three figures relate to employment in the core commercial maritime service sector.
[V] European Commission plus Maritime Safety Agency.

insurance-related businesses. Legal services account for a further 2,500, ship classification 1,850 and banking, accounting, publishing and international representative organisations employing about 500 people each.

Germany comes second in the maritime related service sector employment with 16% of total employment and nearly 14,000 employees. This is fairly closely followed by France with just over 11,000 employees (12%) and the Netherlands with closer to 10,000 workers (11%).

Table 9.2 Share (%) of employment by country



Source: ECOTEC Research & Consulting, 2006

If we look at some of the factors affecting employment in the service sector, growth in world trade and the world fleet have expanded the market for maritime commercial services and the tightening of international regulation has also resulted in a surge in shipbuilding since 2000 in order for ships to meet new design and safety requirements. This in turn generated heavy demand for additional finance in the UK for example.

9.4 Employment forecast

Overall the maritime services sector is seen as a growth sector, in terms of value and employment. Employment in the French maritime and transport related insurance industry has demonstrated a clear growth between 1997 and 2001. Another sub-sector that has a clear growth potential is ship brokerage due to the major developments in international shipping that come from soaring freight rates and the boom in shipbuilding orders that

create greater demand for ship finance. The number of shipbrokers and their support staff saw an apparent increase in the UK between 2000 and 2005.

Maritime related R&D is in particular seen as a growth segment. The European maritime sectors are facing R&D challenges, which require a strong R&D workforce base. Some of the challenges ahead include oil extraction from increasingly deep waters, operating offshore wind farms in deeper waters and greater distances from the shore, exploitation of deep water energy sources such as methane hydrates, technological advancements to counter high European labour costs and exploring the potentials of marine biotechnology[I].

[I] Douglas-Westwood (2005) World Marine Markets.

10.0 Maritime works

The maritime works sector comprises a wide range of sea and inland waterway related activities. In this study the maritime works sector is defined as follows:

- Dredging (capital, maintenance and remedial) of docks, harbours, approaches, river jetties and major navigation channels.
- Construction of new land in the sea.
- Coastal protection.
- Manufacturing, laying and maintenance of underwater cables.
- Maritime related construction.

10.1 Economic impact

In global terms, the value of the maritime works sector has grown rapidly over the past decade with the current annual volume of sales standing at around €7 billion. The total turnover of the member companies of the European Dredging Association (EuDA) stands at €4.2 billion.

Four of the largest Western European dredging companies account for approximately 60% of the world-wide sales generated in the so-called open markets. Dredging and other sub-sectors of the maritime works sectors are particularly important for the both economies and particularly maritime economies of the Netherlands and Belgium.

A number of other smaller dredging companies are active all over Europe and sometimes worldwide; a lot of whom (10) are subsidiaries of the big four. The dredging sector is also regarded as a basic industry with important spin-off effects: 1 person onboard creates 3 to 4 direct positions onshore and has many more indirect effects[I].

In the less open markets, dredging works are normally carried out by state-owned companies or local private companies. But in recent years dredging work by state-owned companies has somewhat declined due to the deregulation of global trade and consequently the 'opening' of closed markets. The free market has expanded in favour of professional dredging companies, in particular the above mentioned larger Dutch and Belgian players.

[I] EuDA.

10.2 Availability of employment data

Only three countries follow the collection of employment data for the maritime works sector; Belgium, France and the Netherlands. The data has been collected as a part of larger maritime cluster studies and only in countries where the sector plays a relative important economic role.

In addition to these cluster studies, the representative organisation for the dredging industry, European Dredging Association (EuDA), collects data on the level of employment in its member companies. Data collection for other sub-segments of the sector is much more limited, and some of the employment data in this study refers to individual company employment. Data collection is also further complicated by the fact that many construction companies are involved in water based construction projects (e.g. bridges) as well as land based construction projection; making it difficult to estimate the number of employees only involved in water based development projects. The German figure is substantially larger than for other countries as the figure is based on employment in the wider maritime works sector – which is not studies in many other countries to the same level of detail[I]

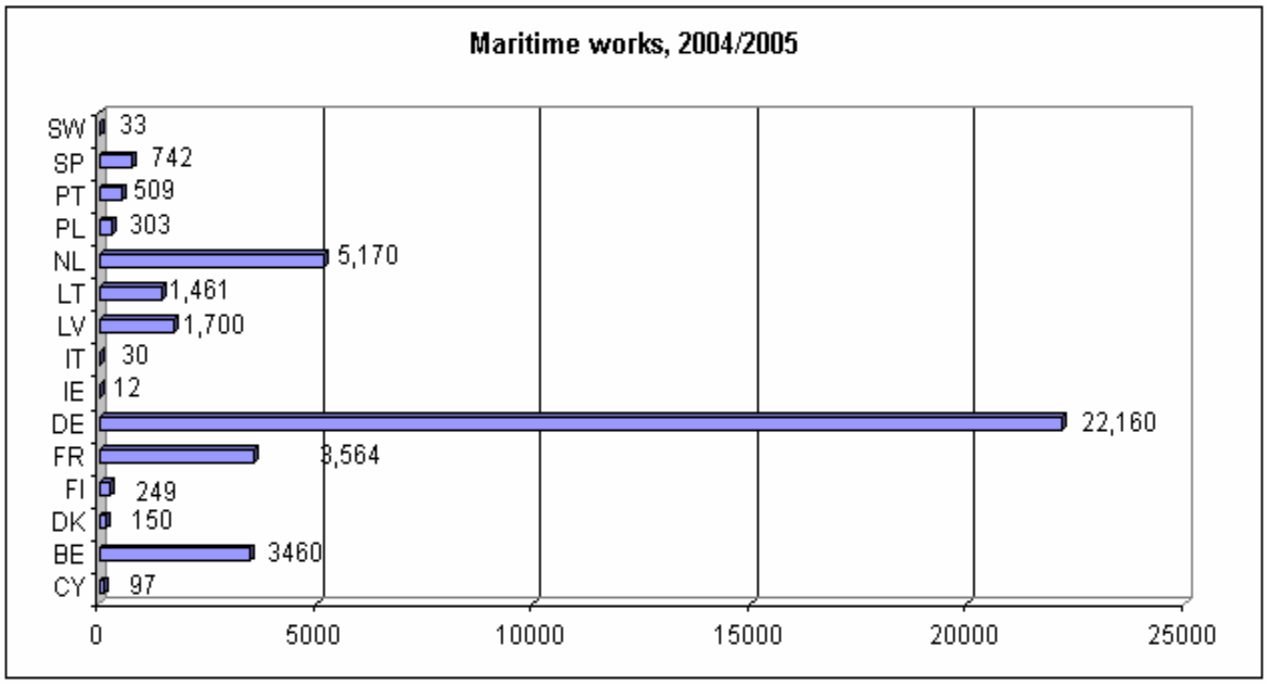
10.3 Employment trends

According to the European Dredging Association (EuDA) the dredging industry alone contributed to the creation of a total of 53,289 jobs (17,763 directly and 35,526 indirectly) in 2005. One third of employees were employed as seafaring crew and the rest ashore. Employment in dredging companies has grown strongly in recent years, with employment more than doubling in some companies over the past 5-10 years.

By looking at data from national sources for the wider maritime works sector, the sector provided employment directly for nearly 40,000 individuals in 2004/2005[II]. Indirect employment of the sector has only been calculated in the Netherlands and Belgium and in both countries the indirect employment effect has been greater than the direct one. In Belgium the sector provided just under 4,000 jobs indirectly in 2004 (demonstrating a growth trend of 9.8% in comparison to the year 2000). In the Netherlands the maritime works sector generated 7,620 indirect jobs in 2002 (220 jobs more than in 1997).

[I] German figures are from the maritime cluster study by Michael Jarowinsky (MC), Joachim Brodda (BALance Technology Consult Germany); Potenzialstudie für die maritime Wirtschaft in Schleswig Hostein und Deutschland, 2005

[II] Data for Cyprus is from 2000, France from 2001, for the Netherlands from 2002, for Portugal and Poland from 2003.



The patchy nature of the employment data makes it is difficult to determine the exact trend for the sector. But according to the available data, employment has increased in Belgium, France and the Netherlands. Employment has remained stagnant in Sweden and Latvia, and declined in Finland, Cyprus and Poland, and has been particularly volatile in Portugal. The European largest dredging companies reported a stagnant period between 2002 and 2005 but a period of a strong growth since then, and emphasised that the dredging industry is an economically cyclical industry. Others reported an increase in turnover of dredging companies of 40% to 50% over the past decade, leading a 20-30% gradual increase in employment.

Table 10.1 Employment in the maritime works sector

Country	1995	1997	1998	1999	2000	2001	2002	2003	2004/2005
Cyprus	321	-	-		97	-	-		-
Belgium - Direct - Indirect	 - -	 - -	 - -		 3,150 3,570	 - -	 - -		 3,460 3,920
Denmark	-	-	-	-	-	-	-	-	150
Finland	-	-	-	-	322	304	274	282	249
France	-	2,956	-	3,356	3,835	3,564	-	-	-
Germany	-	-	-	-	-	-	-	-	22,160
Ireland	-	-	-	-	-	-	-	-	12
Italy	-	-	-	-	-	-	-	-	30

Latvia	-	-	-	-	-	-	-	-	1,700
Lithuania	-	-	-	-	-	-	-	-	1,426
Netherlands - Direct - Indirect	- -	5,000 7,400	- -	- -	- -	- -	5,170 7,620	- -	- -
Poland	-	-	-	-	-	579	499	303	-
Portugal	-	972	1,032	973	1,240	1,153	566	509	-
Spain	-	-	-	-	-	-	-	-	742
Sweden	-	-	-	-	30-35	30-35	30-35	30-35	30-35

Source: ECOTEC Research and Consulting (individual sources identified in country reports)

In France dredging related employment declined between 1997 and 2002 by 80 persons (from 676 to 596) but at the same time employment related to manufacturing, laying and maintenance of underwater submarine cables employed increased by over 400 persons (to 1,507 persons in 2002) – regardless of fairly sharp fluctuations during this period[I].

Sea-based employment in the maritime works sector employs a significantly larger share of foreign employees than in shore-based employment. For example, in Belgium, four out of five employees in the sector were of Belgian origin in 2000, but a substantially higher proportion of foreign employees is prevalent in shore-based employment.[II]

10.4 Factors affecting employment

One of the most important factors affective employment over the past decade has been the opening of the 'less open markets' and infrastructural developments in the South East Asia and now increasingly in the Middle East and India. The free market has expanded in favour of professional dredging companies, in particular the above mentioned larger Dutch and Belgian players.

Dredging industry employment usually follows the global economic trends, being sensitive to upswings as well as downturns.

Technological developments have been another key factor affecting the level of seagoing employment in the dredging sector; technological advancements of recent years have led to efficiency gains and to a lower number of personnel per dredging vessel.

[I] French marine –related economic data 2003, Ifremer.
[II] Policy Research Corporation (2001 and update 2004) *Economic impact study Belgian shipping cluster*

Adoption of international regulative frameworks and guidelines also affect the dredging industry. This refers for example to the State Aid Guidelines and the level of their 'exploitation' by the Member States; the ISM safety certifications; regulations dealing with emissions such as the new Directive on NOx; landfill and Habitats Directives; Natura 2000; ILO conventions on labour standards; EU enlargement; European funded programmes such as 'Eurosion' research project on coastal erosion, ERAMAR on coastal development and Beachmed on restoration of coastal regions.

The availability of labour is another factor affecting employment in the dredging sector over the past years and during next 10 years to come. According to the dredging industry representative, the demand for qualified dredging sector personnel is growing. This is fuelled both by the need to replace ageing workers and the expansion of the dredging fleet.

The supply of young educated personnel is too limited in Europe at the moment and the dredging sector can only employ skilled, educated personnel. Dredging companies are facing a shortage of young graduates for the dredging fleet in the Western European countries and are not having to, on an individual bases, develop additional dredging education in Eastern European and the Far East.

10.5 Employment forecast

After a few less profitable years nationally as well internationally, the net profit of most enterprises in maritime works increased in 2005, especially for international dredging companies. For 2006, most companies expect increasing turnover and higher equipment usage. Ecologically responsible dredging is more than ever an economic necessity due to the increase in seaborne trade. That is one reason why the significance of dredging as an instrument for economic growth is itself growing.

Industry representatives have forecast an overall increase in dredging activity with a growth rate of 10% to 15% for the upcoming decade. The impact on employment is likely to be a slightly less limited (an annual growth rate of 5% has been predicted) due to the impact of automatisation and technological advancements. But as a whole, an increasing turn-over (worldwide), diversification, a growing number of environmental and coastal protection projects and the need to develop coastal tourism infrastructure and transport infrastructure generate demand for new jobs.

The following discusses some of the macro-growth factors that are likely to contribute to the growth of the European dredging market over the next 10 years in more detail. It divides the sector into five sub-sectors; harbours (new built, enlargement), harbour

maintenance (maintenance dredging i.e. the removal of sediments), land reclamation, coastal protection and offshore work. And it also demonstrates the extent to which these growth factors have the potential to impact employment and turnover of different sub-sectors.

Growth areas impact employment in the maritime works sector	Strong growth potential by sub-sector	Intermediate growth potential by sub-sector
Growth in trade (and container traffic)	Harbours (new built, enlargement and deepening)	Harbour maintenance and land reclamation
Growth in coastal tourism	Land reclamation and coastal protection	Harbours (new built, enlargement and deepening) and harbour maintenance
Growth in energy consumption	Harbour maintenance and offshore work	Land reclamation and harbours
Environmental protection	Land reclamation, harbour maintenance and coastal protection	
Climate change	Harbour maintenance and coastal protection	Land reclamation

The table shows that the continuous growth in global trade (as well as a constantly growing size of containers, ships and cruise liners) is likely to have a positive affect on the industry through a growing number of harbours as well as enlargement and deepening of existing harbours and provision of turning basins - and their maintenance. For example, the city of Helsinki recently opened up new Vuosaari harbour after realising that expansion of the existing harbour was no longer enough to meet the needs of the cargo traffic. Growing energy consumption has meant and in the future continues to lead to construction and, particularly, clean-up of petroleum and LNG harbours. For example, recently over 160,000m^3 of sea front by a Dutch petroleum harbour was dredged and parts of it thermally cleaned. Need for environmental protection indeed creates opportunities for the industry; for example, environmental activities account for 15 percent of the annual turnover of Dredging International. Climate change creates needs for coastal protection, as well as growing coastal tourism industry.

The main threat for employment in the dredging sector is a growing shortage of labour; European are increasingly unwilling to work abroad, the supply of training does not currently need the demand for personnel, there is a shortage of STCW certified personnel and young people are not valuing employment at sea. This is regardless of the fact that industry representative view dredging as a sector with good career prospects both on board and on shore.

11.0 Offshore and coastal wind energy

This chapter analyses economic and employment trends in the offshore and coastal wind energy sector, and pays particular attention to the potential the sector has in generating employment in the future.

The progress of wind power around the world in recent years has been impressive and between 1995 and 2005 the cumulative installed capacity has increased from 4,800 MW to 59,084 MW, of which more than 40,500 MW or 69 percent were installed in the EU[I]. Europe also dominates the market for wind turbine manufacturing and controlled 90% of the global market in 2002. The main reason for this is that the US market is characterised by 'boom and bust', which means that it is booming for two years and then it goes bust for two years, and manufacturing companies have therefore been reluctant to set up manufacturing in the US. As a consequence, a significant share of European wind turbine manufacturing is exported to the US.

The most successful markets for wind power in the EU are Germany, Spain and Denmark, who account for nearly 80% of the wind power capacity installed in Europe and around 90% of direct employment. In respect of the new member countries installations are beginning to take off, especially in Poland, Estonia and Latvia. The only countries in the EU that by the end of 2005 did not have any installed wind energy capacity were Cyprus, Malta and Slovenia.

Although most of the current wind capacity is installed onshore, albeit near the coast, offshore sites are becoming the new frontier for the wind industry. In northern Europe alone many thousands of megawatts of capacity are planned off the coasts of a dozen countries. The main motivation for going offshore stems from the considerably higher and more predictable wind speeds to be found out at sea. With average speeds well above 8 metres per second at a height of 60 metres, most of the marine sites being considered in northern European waters are expected to deliver between 20% and 40% more energy than good shoreline sites. A second advantage is that placing wind farms offshore reduces their impact on the landscape, with many of the developments now being planned virtually invisible from the shore[II].

It is currently more expensive to build wind turbines out at sea. Offshore wind farms require strong foundations, which must be firmly lodged in the sea bed. Many kilometres of cabling is also required to bring the power back to shore, and both construction and

[I] Global Wind 2005 Report (2006) GWEC
[II] Wind Force 12: A blueprint to achieve 12% of the world's electricity from wind power by 2020 (2005) GWEC

maintenance work must be carried out in reasonable weather conditions using specialist boats and equipment. Moreover, the technology for offshore wind is currently about 15 years behind that of onshore wind. Nonetheless, the cost of building offshore wind turbines is reducing rapidly and importantly, it is reducing much faster than that for onshore wind turbines[I].

By the end of 2004, a total of almost 600 MW of offshore capacity (just under 2 percent of total wind capacity) had been installed around the coastlines and large inland waters of five European countries – Denmark, the UK, Sweden, the Netherlands and Ireland. The largest of these, at Nysted in Denmark, has a capacity of 165.6 MW. In the future, however, much larger offshore projects are envisaged, with total capacities rising to above 1,000 MW and with individual turbines in a size range up to 5 MW. These would benefit from economies of scale and a resulting reduction in unit production cost. The targets set and licenses issued by a number of European countries show the expectation for substantial growth in the offshore market over the next few years. Indeed, between 2006 and 2010 an additional offshore capacity of some 5 GW is expected to be installed. In the longer term, the target set by the European Wind Energy Association (EWEA) is for 70 GW (or nearly 40 percent of total wind capacity) to be installed offshore by 2020[II].

11.1 Economic impact

In addition to wind energy's significant environmental benefits, the industry also has a considerable economic impact. Currently, the wind turbine business is an €8 billion industry in Europe and in 2012 it is forecast that the world market will be worth €130 billion. In Europe it has been forecast that the wind energy market could be worth €80 billion per annum by 2020.

An important strength of the European wind energy market is that it is characterised by a larger degree of stability compared to the US market. A stable market is often a prerequisite for manufacturers of wind turbines when they choose where to locate. The EU also benefits from the fact that it is made up of 25 markets. To a considerable extent this reduced the risks for manufacturers, as it is relatively easy to move production to another EU-25 country if the market for wind power decreases in one country. Moreover, the distance between countries and markets is relatively small, which makes it possible to export wind turbines and other equipment. Knowledge and technology is also appreciably more developed in Europe compared to other OECD countries. Most of the technology used in the wind energy sector has been developed in Europe. Indeed, the American firm

[I] EWEA (2006)
[II] EWEA (2006)

General Electrics uses German technology and has located its research centre in Germany.

Generally the European market is very strong and the only weakness, if any, is that it has relatively high labour costs compared to Asian countries such as India and China. Nevertheless, the skills base in Europe is appreciably higher which to some degree compensates for the higher labour costs.

It is probably unrealistic that wind energy will be able to compete with coal and nuclear plants etc that have been established and paid for by tax payers in the past. Nevertheless, there is an opportunity for wind energy to compete with other energy sources when additional capacity is needed. Clearly, the cost per kWh and energy efficiency will be key to the future competitiveness of the sector. Wind energy and hydro energy are the only indigenous resources that all countries currently have access to. Thus, for countries that do not sit on large quantities of oil, gas and/or uranium it may help to reduce countries' dependency on energy imports.

Although technology is relatively well developed in Europe, given the limited funds that has been used compared to other sources of energy, there is still an opportunity to improve technologies, particularly in the offshore market.

The main threat to the wind energy market is that the oil price per barrel will fall significantly. Although prices are currently on an all time high at $70 per barrel, Saudi Arabia and other oil producing countries have many decades worth of oil left in the ground and so have an incentive to cap prices to ward off conservation and substitution. There is also an uncertainty at the moment on what role nuclear power will play in the future. Although wind energy is currently cheaper than nuclear power, there is still a threat from nuclear power as it can provide very large scale energy production.

11.2 Employment trends

Employment in the European wind energy sector has been increasing considerably since the beginning of the 1990's, as exemplified by the Danish experience where employment has increased from some 2,900 in 1991 to 21,000 in 2002. Growth in employment has also been considerable in Germany and Spain where employment nearly doubled over the period 2000 to 2002.

Overall, the number of people employed in the European industry has increased by some 188% since 1998, from 25,075 to 72,275 in 2002. These figures do not however include employment associated with exports and construction and installation of wind farms

outside the EU and thus is expected to significantly underestimate total employment in the wind energy sector.

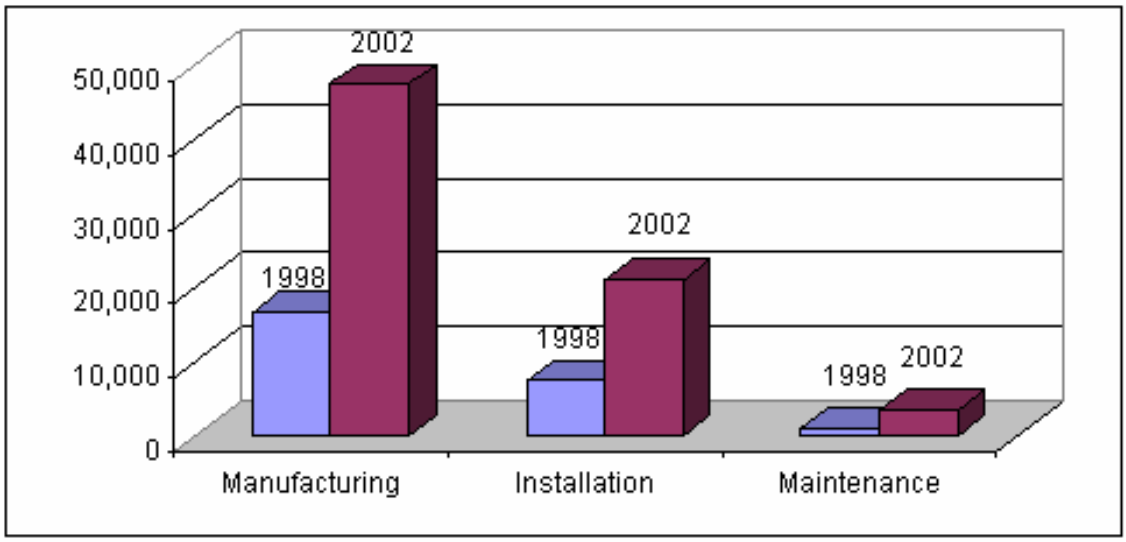
Table 11.1 Employment trends

	Turbine Manufacturing	Wind Turbine Installation	Maintenance Activities	Total
Total employment 1998	**16,725**	**7,400**	**950**	**25,075**
Total employment 2002	**47,625**	**21,150**	**3,500**	**72,275**
Growth 1998-2002	**185%**	**185%**	**268%**	**188%**
Austria	720	213	60	993
Denmark	6,624	1,500	300	8424
UK	1,150	800	50	2000
France	756	340	44	1140
Germany	10,439	5,771	1,010	17220
Greece	0	30	90	120
Portugal	60	100	30	190
Spain	11,197	4,500	966	16663
Others	0	1,395	218	1613
Total direct	**30,946**	**14,649**	**2,768**	**48,363**
Total indirect	**16,679**	**6,501**	**732**	**23,912**
Total employment	**47,625**	**21,150**	**3,500**	**72,275**

Source: EWEA, 2005 (Note: Employment in Italy and the Netherlands have not been specified due to lack of data, although some wind turbine manufacturing does take place in both these countries).

As the table above shows, 48,363 people were directly employed in the wind energy sector. However, the sector also contributed to the employment of 23,912 through supply chain linkages and induced effects. Table 11.1 below displays how strong the growth in employment was between 1998 and 2002 with employment more than doubling in all sub-sectors.

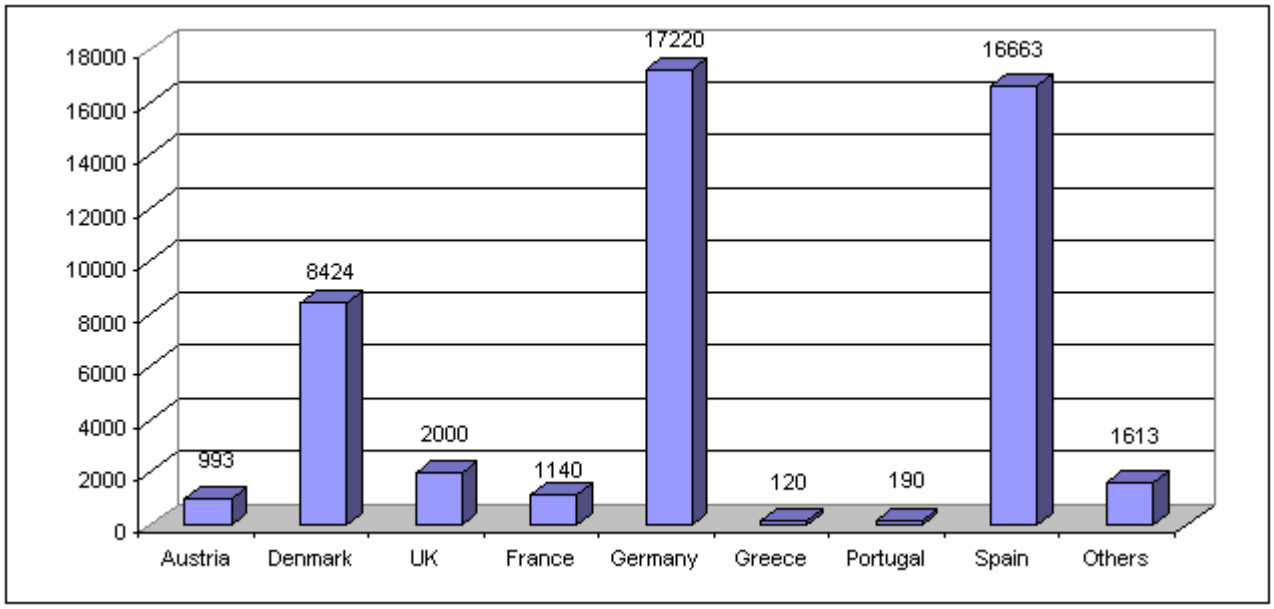
Figure 11.1 Employment trends, 1998-2002



Source: EWEA, 2005

Direct employment in the cluster is concentrated in Germany and Spain, as demonstrated by the graph 11.1 below.

Figure 11.2 Direct employment in the wind energy sector



Source: EWEA

The majority of employment in the European wind energy sector is in the manufacturing of wind turbines – accounting for nearly two-thirds of total employment in 2002. More than 90% of this employment is located in Germany, Spain and Denmark.

In addition to the 47,625 jobs in the manufacturing, a further 21,150 people are employed in wind turbine installations and 3,500 in wind turbine maintenance. Perhaps

unsurprisingly, given their wind energy capacity, Germany, Spain and Denmark also have the highest employment in wind turbine installation in Europe. Notably, the UK has a relatively high employment figure for wind turbine installation, relative to their wind turbine capacity. This can partly be explained by the remote location of some UK wind parks which require quite extensive road construction and grid infrastructure investment[I]. Employment in relation to operation and maintenance is still relatively small compared to that associated with manufacturing and installation. Nevertheless, as the installed capacity increases the employment related to operation and maintenance will also increase considerably. Notably, the EWEA study showed that operations and maintenance of wind farms is more employment-intensive in countries with the least installed capacity. It is also notable that the UK has relatively low maintenance employment figures compared to other countries, whereas its installation-related employment is the highest in the EU (relative to its capacity).

In respect of the proportion of total employment that is attributable to offshore wind energy there are currently no official statistics available. However, as a rule of thumb there are 12 job years in wind turbine manufacturing per MW (not including installation, maintenance and operations)[II]. Using this rule of thumb it is estimated that some 7,000 (7,068) job years have been generate through the manufacturing of offshore wind turbines.

In respect of employment arising from the installation of wind turbines and operations and maintenance it estimated that an average of 3 and 0.1 persons are employed per MW respectively. Applying these figures to the current offshore capacity gives us an estimate of some 1,767 people employed in activities related to installations and 60 people employed in activities related to the maintenance and operation of offshore wind farms. However, given that offshore wind power is currently about 75% more expensive than onshore wind and that it requires more labour input, these estimates may significantly underestimate employment in offshore wind. It should also be noted here that if wind farms situated within 50 km from the coast are included in the definition for offshore wind, the offshore market would account for a significantly larger share of total employment.

As mentioned above only five countries have offshore wind capacity currently and of these Denmark currently accounts for some 75% of total employment in offshore wind - largely as a result of the installation of three new large wind farms in 2003 which together account for nearly two-thirds of total offshore capacity in Europe.

[I] Wind Energy The Facts (2006) EWEA
[II] EWEA (2006)

11.3 Employment projections

According to projections by the EWEA, employment in the European wind energy sector is expected to increase substantially in the near future. The following table outlines employment projections for two different scenarios – one of these projects a marginal reduction in employment whilst the other projects a doubling of employment. The reason for this is that the one for 2010 projects a slight decline in employment because it only includes employment effects from installation activity in Europe. Furthermore, the employment effect from export of European produced wind turbines is excluded. Despite this, employment is expected to remain stable. The reduction in employment associated with manufacture of wind turbines is largely balanced by the increase in employment associated with maintaining the already installed capacity.

Table 11.2 Employment projections, 2010 - 2020

	Turbine Manufacturing	Wind Turbine Installation	Maintenance Activities	Total
Total employment 2002	47,625	21,150	3,500	72,275
Projected employment 2010	40,732	21,194	6,420	68,346
Projected employment 2020	153,400	27,400	16,100	196,900

Source: EWEA, 2005

The table above shows that total employment relating to manufacturing, installation and operations and maintenance is expected to increase to 196,900 by 2020. This represents more than a doubling of employment in the wind energy sector compared to 2002. In respect of individual countries, it is expected that countries like Poland will account for a slightly greater share of wind turbine manufacturing, particularly for the offshore market, as a result of relatively lower labour costs. Nevertheless, this outsourcing will be limited as production is generally located in those countries where demand for wind power is the highest (i.e. Germany, Spain and Denmark). France, which currently has relatively low employment in the wind energy sector, may also experience an increase in employment in the near future[I].

As mentioned above, the offshore market is expected to increase significantly in the near future, with a target of 70 GW being set for 2020. This represents nearly 40 percent of the targeted installed capacity. If this proportion is used as a proxy for total employment in the offshore market this would mean that it would employ some 76,600 (76,572) people by 2020.

[I] EWEA (2006)

In respect of individual nations, there is foreseen rapid development of offshore wind in the Netherlands, Denmark and the UK. In the UK the focus on offshore wind is largely a consequence of the fact they are hoping to gain a technology lead in the offshore market. In Denmark and the Netherlands on the other hand the focus on offshore wind can partly be explained by the high population density which makes it spatially difficult to find new locations for onshore wind farms. Of the new member countries, Poland has the greatest potential of developing its offshore market.

Experience from previous years shows that the targets for total wind capacity are likely to be revised upwards in a few years. Indeed, the target set for 2000 in 1991 was already achieved by 1997 and the target set for 2010 in 1997 was achieved already in 2005.

11.4 Skills and training

A significant share of workers in the wind energy sector has been drawn from the declining shipbuilding sector in Europe, as exemplified by the Danish experience where many wind turbine manufacturers, particularly offshore, have located their production in the old shipyards and employed a significant number of workers that used to be employed in shipbuilding. Importantly, these shipyards, and hence wind turbine manufacturers, are generally located in depressed areas with high unemployment rates and has therefore served to regenerate these local areas (see case study example, Nakskov and Rudkobing).

Retraining of workers from the shipbuilding sector is not very complicated and the same is true for workers in the car manufacturing industry, which is another European industry that is currently showing signs of decline. As a result, there is generally not a shortage of labour or skills in the wind energy sector, though in some countries there is a slight shortage of electrical engineers.

Although there is currently no shortage of available labour in the production and installation of wind turbines, there is a need for skilled labour at the research centres.

12.0 Marine aggregates

Marine aggregate production both in France and the UK makes up a little less than 3% of national production of building materials. If the activity is classified as extraction, unloading, drying and calibration to delivery for processing the total turnover of the industry in France was €25 million in 2001 and 2002. The value added stood at €10 million[I].

The marine aggregates industry contributes to the creation of 2,500 jobs on British-registered vessels and on land[II]. Total employment for the sector in 2001 in France was 300.[III] For siliceous materials direct employment is estimated to be 200 seamen and 100 on-shore staff (admin, sales and technical duties).

[I] French maritime-related data 2003, Ifremer
[II] BMAPA, 2006
[III] Ibid.

13.0 Coastal tourism

Coastal tourism has become a sector of major economic importance; indeed it is the most significant maritime sector (as defined in this study) in terms of employment in almost all EU Member States with a coastline. For the purposes of this research, coastal tourism employment is defined as employment generated directly by tourism activities within 50km from the sea. Our aim was to focus on tourism industry employment which is defined as employment related to the operation and running of accommodation establishments, restaurants and cafes, tour operators, sights and visitor, travel agencies and tourist information facilities. However, in some countries coastal tourism employment also covers employment generated by the wider tourism economy, e.g. employment in passenger transport companies.

The traditional coastal tourism product has focussed on the Mediterranean countries; Spain, France, Italy, Greece, Cyprus and Malta in particular. Today the coast of Croatia and Slovenia are also growing as coastal tourism destinations. Marine related tourism and cruise tourism are also showing evidence of strong growth in many of the Northern European countries such as the Baltic States and Germany. The North Sea regions have developed the sailing and spa markets in the coastal regions. This study however refers to all tourism industry employment within 50 km from the sea; therefore it also encompasses the growth in city and short break tourism to many capital cities of Europe (e.g. Tallinn, Stockholm, Copenhagen, Helsinki, Riga).

Coastal tourism has seen growth over the past 2-3 decades mainly due to more leisure time, increased spending power and improved communication and transportation technologies. In recent years, 'second-home tourism' to the Mediterranean countries has increased dramatically from the Northern Europe, the UK in particular, partly as a result of the rapid expansion of low cost airlines.

13.1 Economic impact

The economic or indeed employment impact of coastal tourism has not been calculated at European level or at the Member State level, apart from France. The World Marine Market review estimates the economic impact of marine tourism (defined as marine tourism excluding the impact of travel and accommodation) to be €74 billion in 2005. This figure was found by calculating the economic impact of the tourism industry in Europe and calculating a percentage for marine tourism. This approach has also been found to have its limitations and at its best can only act as an approximation.

13.2 Data availability and reliability

The availability of studies analysing employment in coastal tourism is also extremely limited as the definition of this study classifies coastal tourism as tourism employment within 50 km from the sea or on the sea. With this classification coastal tourism does not only relate to marine tourism activities but all tourism employment within the classified distance from the sea, also including cities situated by the coast. France is the only country which has developed a systematic and on-going methodology for data collection on the coastal tourism sector. Ireland is the only European country where a study was found that looked at employment generated from sea and water-related tourism activities only, but the study only included employment created by international tourists[I].

Eurostat together with OECD and the World Travel and Tourism Council have adopted a common methodology for tourism employment in the form of a Tourism Satellite Accounting but as a part of this study it was found that tourism stakeholders at national levels have not yet fully started to use this methodology. Accurate employment calculations for the sector are further complicated by the seasonal and temporary nature of employment and issues around undeclared work.

For this study we have used a variety of methodologies to assess the most accurate level of employment related to coastal tourism in each study country – as it is only within the scope of this study to rely on *existing* labour market information. The methodologies that have been adopted for this study have varied from estimates on the share of coastal tourism of total employment provided to us by national experts, usually representatives of the national tourist board or ministry responsible for tourism, to LFS tourism employment[II] data for NUTS II / III coastal regions. The weakness of the latter is that whilst it under-estimates coastal tourism related employment in a sense that the data usually only covers accommodation and restaurant related employment, it however at the same time over-estimates employment in a sense that the regions tend to cover more than 50km from the sea and many restaurants are mainly used by local people.

In other cases total tourism employment figures have been used, as provided by the national tourist boards, and their estimates on the proportion of coastal tourism employment as a part of total tourism employment. Therefore some of the figures are somewhat crude measures of total coastal tourism employment and should be regarded as an estimate only. It is however also worth mentioning here that WTTC[III] data would

[I] Employment generated by seaside / resort trips, angling, coastal and inland boating, watersports and nature-related coastal activities.

[II] Usually the NACE code for hotels and restaurants only.

[III] World Travel and Tourism Council – tourism satellite accounting.

provide comparable employment data for the year 2006 for all the 21 EU countries with a coast, but it was decided to use the data recommended/provided by national stakeholders as it at times tended differ substantially from the data from national sources.

We also aimed to use another method which entails calculating overnight stays in coastal regions and then assessing tourism employment on the basis of expenditure and overnight stays. During this exercise it however became clear that this method was even more unreliable due to weaknesses in each step of the method. First of all, Eurostat data on overnight stays is available for residents and non-residents – but this information is available only for NUTS II regions. Therefore these statistics include the same areas than the employment figures obtained through LFS, areas which often cover much of the country (e.g. in the case of Italy only 6 NUTS II regions out of 21 are not located by the sea). Secondly, assumptions and calculations on tourist expenditure per overnight stay vary substantially, particularly between business and holiday travellers and from country to country in the EU. Finally, although generally speaking tourism industry employment is low paid, the cost of full time employee varies from country to country and from region to region. Therefore, this study is focussed on presenting the data generated and/or approved by national stakeholders.

Despite these various challenges, a fairly accurate picture of coastal tourism employment has been obtained for Cyprus, Malta, Belgium, Latvia, Greece, Germany, Poland, Estonia, Lithuania and France. The figures for Latvia, Finland, Spain, Sweden, Denmark and UK are likely to be fairly substantial over-estimates of direct coastal tourism employment as defined in this study. The figure for Ireland is an accurate description of marine related tourism but an under-estimation of coastal tourism as defined as a part of this study. Estimations from Italian stakeholders varied so significantly that it was decided not to include the figures as a part of this study before a greater consensus could be achieved. The following table displays the variety of methods that have had to be deployed to gather available data.

Table 13.1 A selection of methods

Country	Methodology
Belgium	Tourism industry employment in the NUTS III regions by the coast.
Cyprus	Tourism economy employment in the country – and estimation on the share of coastal tourism employment of total employment. An estimation was provided by an official tourism organisation from Cyprus.
Estonia	Total travel and tourism industry employment figure and estimation of the share of coastal tourism employment provided by the Estonian Tourist Board.
Finland	Travel and tourism economy employment in coastal regions (NUTS II).
France	Maritime cluster study that has developed a systematic and on-going methodology collection of data on coastal tourism employment.

Poland	LFS data on hotel and restaurant employment in 2 Polish coastal regions
Portugal	LFS data on hotel and restaurant employment in coastal regions
Spain	Travel and tourism economy in coastal regions (NUTS II) – provided by the Spanish ministry responsible for tourism.
Sweden	Information provided by NUTEK on the share of overnight stays in coastal regions of Sweden.

In addition, it must be understood that measuring employment or economic impact of coastal tourism in any country is challenging because of its effects on several different sub-sectors. Particularly problematic is tourism related employment in relation to passenger transport, sports and cultural facilities and retail. In addition, temporary agency workers are rarely calculated as a part of tourism employment but as a part of retail or trade statistics.

Until more precise methods of data gathering for this specific sector are available, any figures presented in this report (apart from France) must be regarded with a degree of caution. It is also important for the maritime sector stakeholders to consider better definition of coastal tourism employment when it is regarded as a part of maritime industries.

13.3 Employment trends

Data gathered for this study show that in 2004 direct tourism employment in the coastal regions of Europe reached 2,810,373[I]. If the latest possible figures were used from all the study countries, then the level of employment in this sector would rise to nearly three million with 2,916,953 employees. The indirect employment effect of tourism in coastal regions of Europe is likely to be substantially higher.

An analysis of trends in employment over the past decade is fairly straightforward in the sense that almost without exceptions employment has increased. Tourism employment in two of the coastal regions of Poland declined between 2001 and 2004 but otherwise employment growth has been universal. Tourism industry employment in the coastal regions of Belgium increased by 8% between 1995 and 2002, with the most significant increase experienced in the food sector. Tourism industry employment in the coastal regions of the UK, Finland, Sweden and Denmark also demonstrated considerable increases over the past decade. In global terms tourism growth slowed down after the 9/11, but this slowdown has not had a major impact on coastal tourism employment in

[I] Employment for Cyprus and Malta is from 2005/2006, 2003 for Ireland, 2002 for Belgium, Finland and Slovenia and 2001 for France.

Europe. In fact, employment in many countries showed considerable increases between 2001 and 2002.

Table 13.2 Employment in the coastal tourism sector, 1995 - 2005

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005/6
Cyprus - Direct - Indirect	-	-	-	-	-	-	-	-	-	-	43,255 42,781
Belgium	8,238	8,593	8,145	8,376	8,437	8,610	8,748	8,901	-	-	-
Denmark	-	-	-	-	-	-	-	-	-	61,628	-
Estonia	-	12,437	13,043	14,063	15,164	19,218	20,790	26,585	26,993	27,742	-
Finland[I]	-	-	-	-	-	-	-	73,770	-	-	-
France	-	-	167,194	182,826	190,402	196,334	190,688	-	-	-	-
Germany	-	-	-	-	-	-	-	-	-	13,500	-
Greece	-	-	-	181,658	187,518	190,937	194,053	205,752	208,551	195,739	212,878
Ireland[II]	-	-	-	-	-	-	-	-	3836	-	-
Latvia[III]	-	-	12,372	13,469	14,602	14,387	14,804	16,182	16,872	21,336	24,300
Lithuania	2,379	2,793	3,850	3,949	3,701	3,901	4,163	4,337	4,131	4,105	-
Malta[IV]	-	-	-	-	-	-	-	-	-	-	28,000
Netherlands	-	-	-	-	-	80,150	83,020	85,110	85,390	84,370	81,990
Poland	-	-	-	-	-	-	35,600	33,400	33,800	33,500	-
Portugal[V]	35,079	34,958	35,138	36,258	36,789	38,674	39,510	38,778	39,006	38,894	-
Slovenia	-	-	-	-	-	-	-	13,850	-	-	-
Spain[VI]	-	-	-	-	1,252,086	1,364,178	1,378,370	1,450,966	1,536,430	1,576,377	1,665,234
Sweden	57,484	-	-	-	-	67,141	70,918	70,429	71,712	71,023	-
UK	-	-	-	278,771	270,676	272,641	283,515	300,910	307,960	319,859	-

Source: ECOTEC Research and Consulting, 2006 (individual sources identified in country reports)

Employment in the coastal regions of the Baltic States has been particularly strong (with a growth of 123% in Estonia and 73% in Lithuania). This growth in Estonia is however more attributable to the growth in city break tourism to Tallinn, rather than due to marine activities as such, apart from cruise tourism. The following figure displays the trends in coastal tourism in the Baltic States.

I Includes wider coastal tourism economy, including supporting transport infrastructure related employment, rather than tourism industry.

II Data only related to employment generated by cruise tourism and angling, watersports and seaside trips by Irish residents, excludes tourism employment related to largest cities by the coast, e.g. Dublin, Galway and Cork. Therefore this is an underestimation of full coastal tourism related employment.

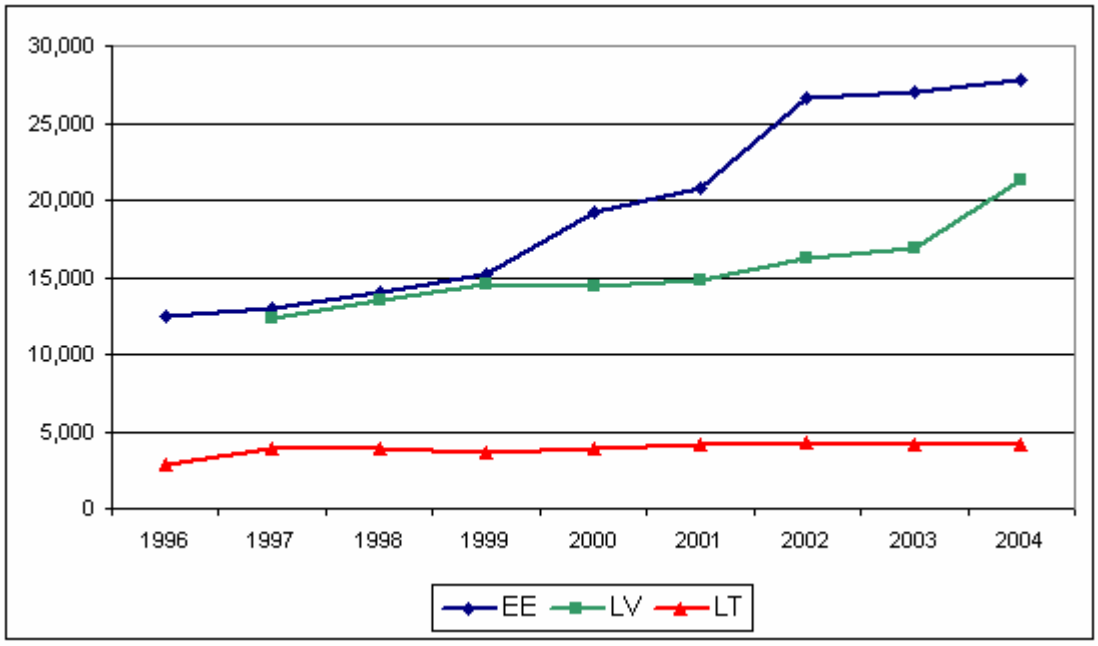
III Currently over-estimation of coastal tourism – this relates to overall tourism employment in the country. In consultation with the tourist board to obtain more accurate estimation on coastal tourism.

IV 2003 figure was provided by the Malta Tourism Authority, 2006 figure by WTTC.

V Only includes employment in the Portuguese hotel and youth hostel sector only, in coastal regions.

VI Currently based on estimation that 50% of total tourism employment in coastal.

Figure 14.3 Employment trends in the Baltic States, 1996 - 2004

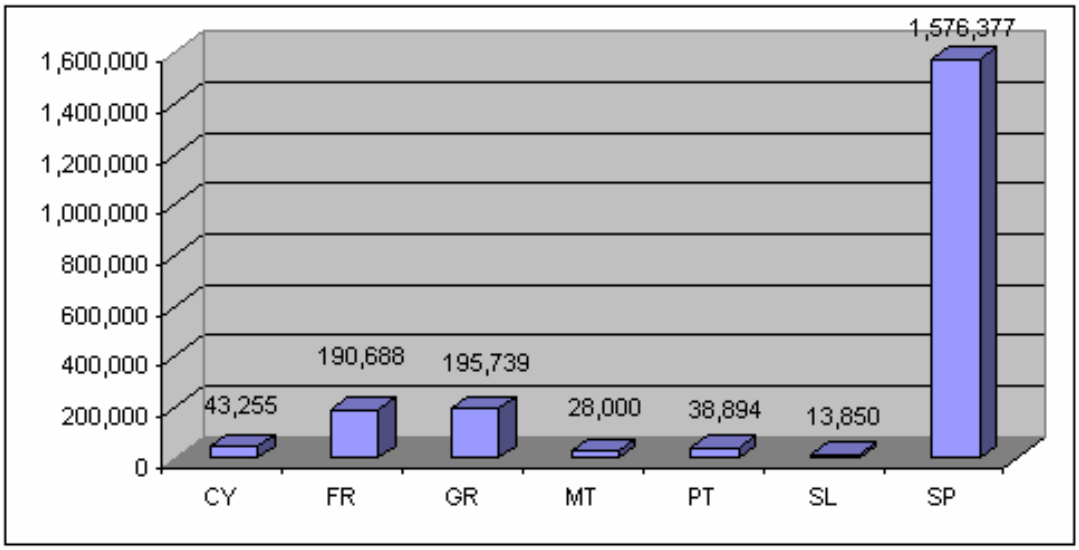


Source: ECOTEC Research & Consulting, 2006

Coastal tourism plays a particularly important economic role in the Mediterranean countries. In Malta, the travel and tourism industry jobs account for 18.4% of total employment in 2006 and the wider tourism economy employment makes up 31.9% of total employment in the country[I]. In Cyprus, 1 in 3.5 jobs are in the wider tourism industry (of which 80% is coastal tourism), and hotels and restaurants are the fifth largest group of employers. In terms of trends, over the past decade, Cypriot hotel sector employment saw a vast increase of 28% from just under 20,000 employees up to over 25,000 employees. Coastal tourism is also the largest sector in the French maritime cluster in terms of turnover, added value and employment - with employment in the sector increasing from 167,000 employees in 1997 to 191,000 over a five year period. The coastal zone of Portugal attracts 90% of foreign tourists visiting Portugal, with coastal hotel related employment increasing by 11% between 1994 and 2004. However, as the following graph shows in absolute terms Spain is by far the biggest country in the Mediterranean and indeed in Europe in terms of coastal tourism employment with 1.6 million employees.

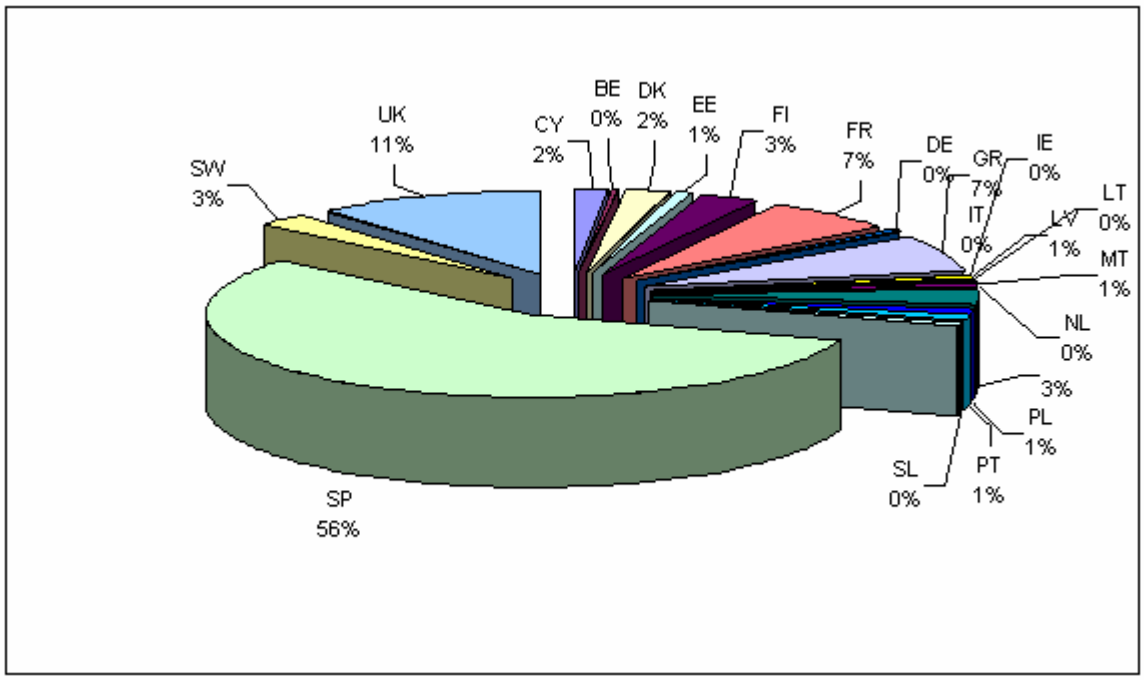
[I] WTTC: Tourism Satellite Accounting, Malta

Figure 14.2 Employment in coastal tourism sector in the Mediterranean countries



Spanish coastal tourism employment constitutes 56% of all coastal tourism employment in the EU Member States. This is followed by the UK, Greece and France.

Figure 13.2 Share (%) of employment by country, excluding Italy, in 2004



Source: ECOTEC Research & Consulting, 2006

13.4 Factors affecting employment

The lack of appropriate comparable data is one of the key issues affecting our ability to reliably indicate employment trends in sea related tourism. However, there are also other

factors related to the qualitative nature of employment in the sector. In most countries, tourism employment is highly seasonal and despite efforts to increase the year-round attractiveness of coastal tourism destinations, this is likely to remain a key feature of jobs in the sector. This not only has an impact on the accurate monitoring of employment trends but also contributes to another characteristic of the sector. A significant number particularly of low skilled, temporary jobs in the tourism industry are undeclared, thus further adding to difficulties in charting employment trends.

13.5 Employment projections

The World Tourism Organisation has forecasted a long-term trend of 3% growth to apply to the European tourism sector until 2020. When looking at individual countries in more detail, a significant increase of 26% in employment has been forecast for the hotel and restaurant sector in Cyprus[I]. By 2011, the Estonian coastal tourism sector is expected to require 4,500 more employees than today. The Maltese Tourism Authority has estimated that by 2009 FTE employment in the accommodation sector has increased by 68% in comparison to the situation in 2001, and the catering sector FTE employment by 32%. An Irish study that looked specifically at employment generated by domestic marine and water-related activities showed that if marine facilities were improved the employment potential of marine related tourism could dramatically increase.

Rapid and even uncontrollable coastal developments in some parts of the Mediterranean coast are now having some detrimental impact on employment in the coastal tourism sector. In terms of the Spanish situation, the Spanish authorities have estimated that the employment potential of the coastal tourism sector is very close to reaching its optimal level, and it is expected that in the next few years employment growth will not only slow down but either stabilise or even start to decrease slightly. Employment forecasts for the accommodation sector remain strong but tour operators and the restaurant sector are expected to suffer the most from this future trend. This is however a contradictory statement in comparison with the findings of the predictions by the Tourism Satellite Accounting (see further information below).

Some European coastal regions can not be further developed for tourism purposes, thus reducing opportunities for employment generation, due to environmental protection. As an example, tourism employment in Neringa region of Lithuania can not further expanded due to the protected status of the area.

[I] The Cyprus Ministry of Economic Affairs and Communication.

Finally, when looking at employment projections for the travel and tourism industries and economies in the Member States with a coastline on the basis of Tourism Satellite Accounting statistics, the following table has been put together to illustrate projected increases and decreases in employment between 2006 and 2016. Although the statistics include tourism employment in the countries as a whole, rather than in coastal regions only, the statistics give a good indication also on projected trends in coastal tourism employment as it was found as a part of this study that coastal tourism employment constitutes a substantial share of total tourism employment in all Member States with a coastline, apart from Germany, Poland, Lithuania and Belgium.

These calculations reveal that only two countries, Denmark and the UK, are expected to witness reductions in employment over the next decade. Nevertheless, national stakeholders and national studies contradicted with this forecast trend of decline and projected further increases in employment.

The table also illustrates that Malta, Spain and Portugal are estimated to experience the strongest growths in travel and tourism industry employment over the upcoming decade (+16.6% to +17.9%).

Table 14.3 Projected trends in employment, 2006-2016

Country	Travel & tourism economy jobs (projected growth %)	Travel and tourism industry (projected growth %)
Belgium	63,000 (13.8%)	9,000 (6.3%)
Cyprus	10,000 (8.8%)	6, 000 (10.5%)
Denmark	-23,000 (-10%)	-7,000 (8.4%)
Estonia	10, 000 (10.3%)	3, 000 (13.6%)
Finland	22, 000 (9.4%)	4, 000 (5.1%)
Germany	637,000 (16.1%)	62,000 (5.3%)
Greece	110, 000 (15.7%)	27, 000 (9.2%)
Ireland	24, 000 (16.8%)	4, 000 (8.3%)
Italy	205, 000 (7.6%)	92, 000 (8.3%)
Latvia	3, 000 (5.9%)	1, 000 (8.3%)
Lithuania	13, 000 (11.6%)	3, 000 (14.3%)
Malta	8, 000 (16.7%)	5, 000 (17.9%)
Netherlands	16, 000 (2.8%)	4, 000 (1.8%)
Poland	57, 000 (5.1%)	16, 000 (6.2%)
Portugal	143, 000 (15.8%)	62, 000 (16.6%)
Slovenia	8, 000 (5.7%)	1, 000 (2.6%)
Spain	1, 365, 000 (36.5%)	250, 000 (17.0%)

United Kingdom	-28,000 (-1%)	-61,000 (-6.2%)

Source: ECOTEC calculations on the basis of WTTC data

13.6 Cruise tourism

Cruise tourism is one of the growth sectors in the maritime cluster but it is not analysed as a sector of its own due the duplication of statistics with tourism and shipping sector statistics. This section however looks into the employment in the cruise tourism sector in more detail.

A CLOSER ANALYSIS ON EMPLOYMENT IN THE CRUISE TOURISM SECTOR

The cruise industry in Europe has undergone significant expansion over the last 15 years – with an annual growth rate of over 10% since 2001. Due to being one of the core sea related growth industries, it was decided to outline the economic and employment impact of the industry in more detail. However, employment data relating to the cruise tourism industry partly duplicates employment data from shipbuilding and shipping sectors. This must be taken into consideration when reading this section.

In Western Europe, the UK remains the largest market with more than a third of all Western European passengers. Other core markets in the cruise industry, in order of significance, are Germany, Italy, Spain and France. Together these five countries account for approximately 90 percent of total cruise bookings.

Although, at present, there is no definitive research in Europe on the economic impact of the operations of the cruise industry it is possible to provide some estimates for the region by drawing from the ICCL/BREA's existing North American analysis. In this study direct spending in 2004 by the cruise lines and passengers on goods and services were calculated at €1,445 per passenger. If this is replicated in Europe the total economic benefit of the operations of the cruise industry was €8.36 billion in 2004. This figure amounts to a total of €17.1 billion if shipbuilding related to cruise tourism is also included. Direct spending on goods and services (related to the operations of the cruise industry) is estimated at €4.10 billion. It should be noted that these figures should be treated as guidance only as there are significant structural difference between the North American and Western European market which will necessarily have an effect on the sector's impact on the economy.

Employment trends

Using the same methods as above for the economic impact, it is estimated that the Western European cruise industry (excluding cruise shipbuilding) directly employed some 110,000 (110,005) in 2004. According to the data from the European Cruise Council the European shipyards building cruise ships provided 26,910 jobs directly and further 80,730 jobs indirectly in marine equipment and service sectors.

According to this data if indirect and direct employment related to the construction of cruise ships is also taken into consideration, the study of the ECC estimates that this total increases up to 217,600. Given that the number of passengers has increased on average 10% annually since 2001, it can be assumed that employment related to the operation of cruise ships has also increased in recent years.

Employment related to the building of cruise ships

As mentioned above nearly all of the world's new cruise ships are being built in European shipyards, or more precisely in four European shipyards in Italy, France, Germany and Finland. Together it is estimated that the cruise industry accounted for the employment of 26,910 individuals at these shipyards in 2004. In addition the shipyards contributed to the employment of 80,730 people in the maritime equipment and service sector, bringing the total to at least 107,640. If the indirect jobs created through the 9,000 sub-

contractors employed by the shipbuilding industry in the service sector are also included this figure would increase significantly. Significantly, the vast majority of maritime equipment and services used for cruise ships is sourced from Europe. For example, at the family controlled Meyer Werft in Germany a recently completed ship's prefabricated cabins were made in Germany, the wall panels in Norway, carpets in Denmark, galleys in Finland, and other products were manufactured in France and Italy. The turnkey outfitting in public areas was completed by a variety of German companies. Mathias Munchau, director of Germany's maritime industry and marine equipment suppliers VSM, suggests that 1,000 to 2,000 businesses lie behind the building of a cruise-ship in Germany.

In Italy and France, the sourcing of equipment and products outside the individual country is less significant, as there is such extensive local manufacturing capability. In France, for example, between one-third and a half of equipment is supplied by French manufacturers.

Employment projections

In 2004 the total number of passengers in the Western Europe cruise market grew by 5%. However, market growth was not consistent in all countries and the market actually contracted in countries such as Greece, Sweden, the Netherlands and Spain. However, in the future, cruise ship operations are expected to continue to expand through an increase in cruise ships and investment which will increase the capacity of the Western European market. This suggests that there are prospects for further employment and economic benefits to be generated from the cruise industry in the future. A demographic trend of an ageing population is expected to further reinforce this trend.

14.0 Navy

In 9 out of 25 EU Member States the naval divisions of the armed forces generated over 191,000 jobs in 2004/2005.

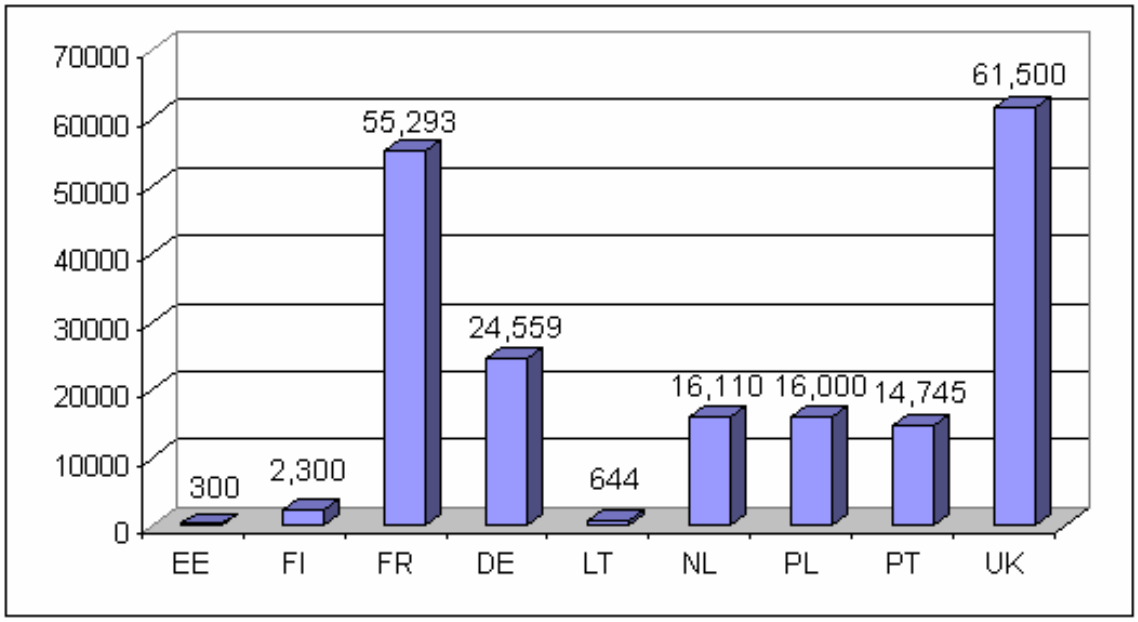
Table 14.1 Employment in navy

Country	Employment
EE	300
FI	2,300
FR	55,293
DE	24,559
LT	644
NL	16,110
PL	16,000
PT	14,745
UK	61,500
Total	**191,451**

Source: ECOTEC Research & Consulting. 2006

The British and French armed forces have the largest navies. The British navy employs 61,500 officers and the French navy just over 55,000. The German navy provides nearly 25,000 jobs and the Polish navy and Dutch navy employ approximately 16,000 soldiers each.

Figure 14.1 Employment in European armed forces, navy



Source: ECOTEC Research & Consulting. 2006

15.0 Fisheries

The fisheries sector covers employment generated by fisheries, seafood processing and aquaculture. As this sector has not come within the scope of this study, no data has been collected at national level for this sector. Instead, it has been covered by the European Commission with its own dedicated study during winter/spring 2006. Although various data sources exist for the fisheries sector, this study directly quotes some of the key findings of the study *'Employment in the fisheries sector: current situation'* that was prepared by LEI BV and Framian BV. The figures in this report are based on Eurostat data.

15.1 Current levels of employment

In 2002/2003, total employment in the fisheries sector amounted to approximately 421,000[I] persons, of whom 405,000 were active in the coastal regions of the EU and 16,600 in the inland areas and the French Drom. It is estimated that one third of this figure are women, who are mostly employed in the fish processing industry.

Table 15.1 EU Overview - employment by country and fisheries sub-sector, 2002-2003

Member State	Total fisheries sector	Fisheries sector as % of total employment	Fishing	Processing	Aquaculture
Austria a)	734	0.0	-	234	500
Belgium a)	1,743	0.0	666	993	84
Cyprus	1,175	0.4	926	122	127
Czech Rep.	2,267	0.0	-	100	2,167
Denmark	14,060	0.5	4,258	8,948	854
Estonia	6,700	0.0	2,500	4,100	100
Finland	2,740	0.5	900	1,339	501
France b)	64,712	0.3	21,436	21,676	21,600
Germany a)	16,409	0.1	1,972	11,404	3,033
Greece	37,701	0.9	30,196	3,360	4,145
Hungary a)	1,680	0.0	-	150	1,530
Ireland	10,584	0.6	5,147	3,439	1,998
Italy	47,957	0.2	38,157	6,708	3,092
Latvia a)	10,580	1.1	3,670	6,484	426
Lithuania	6,565	0.4	2,550	3,700	315

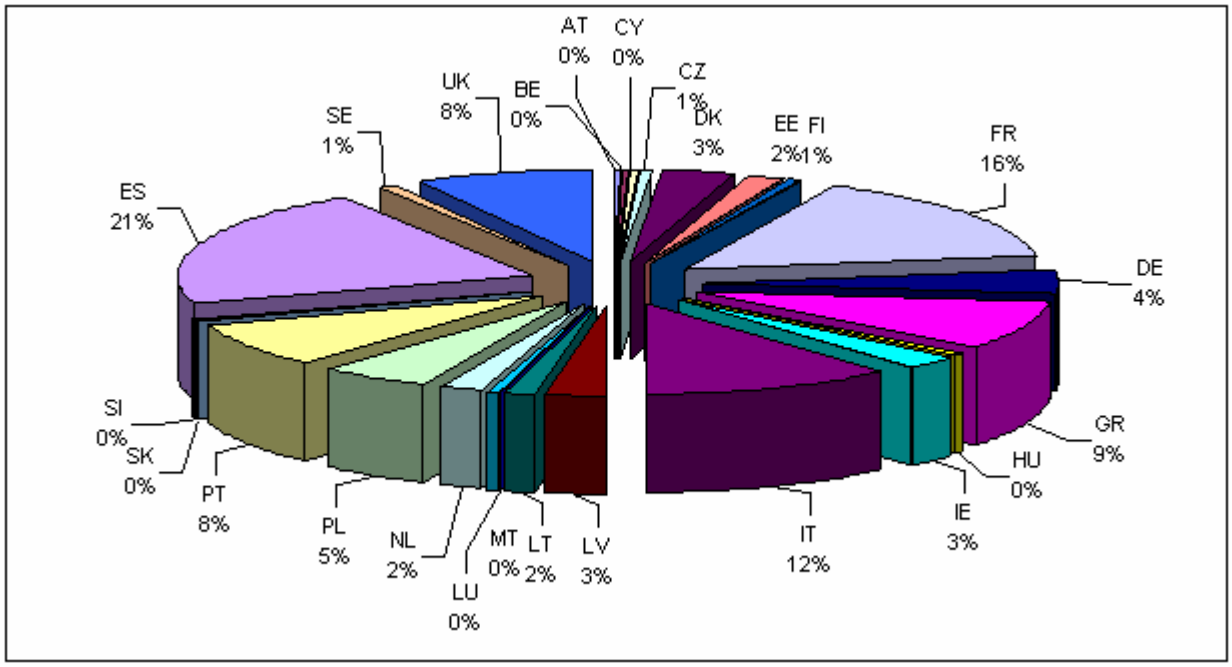
I This is sum of full time and part time, not full time equivalents.

Member State	Total fisheries sector	Fisheries sector as % of total employment	Fishing	Processing	Aquaculture
Luxemburg	-	-	-	-	-
Malta a)	1,441	1.0	1,303	33	105
Netherlands	9,049	0.1	2,547	6,382	120
Poland	19,923	0.1	4,500	13,423	2,000
Portugal	33,229	0.6	20,457	6,300	233
Slovak Rep.	1,180	0.1	-	947	254
Slovenia	623	0.1	132	237	11,928
Spain a)	87,310	0.5	53,849	27,000	200
Sweden a)	3,955	0.1	1,912	1,843	3,580
United Kingdom	33,534	0.1	11,774	18,180	65,365
Total	**421,318**	**-**	**208,852**	**147,102**	**44,978**
- male	310,152	-	200,231	64,944	20,386
- female	111,165	-	8,621	82,158	-

Source: LEI BV, Framian BV, 2006, p.17
a) 2004-2005; b) incl. Drom.

The fishing industry provides most jobs in Spain which makes up 16% of total fishing related employment in the EU. Spain is followed by France (16%) and other Mediterranean countries, Italy (12%) and Greece (9%).

Table 15.2 Share (%) of employment by country



Source: ECOTEC elaboration of data from LEI BV, Framian BV, 2006, p.17

The following table provides a breakdown of current level of employment for different sub-sectors of the fishery sector.

Table 15.3 Breakdown of current levels of employment by sub-sectors

Fishing
The employment on board fishing vessels in the EU-15 has decreased from about 240,000 in 1998 to about 190,000 in 2003, i.e. by 21%. Total employment in fishing in the EU-25 amounted in 2002/2003 to approximately 209,000 persons5. In view of this trend, it is estimated that approximately 190,000 fishermen were employed on board in 2005 (about 175,000 in EU-15). Within this figure, around 3,500 workers are employed in the French Drom. Some 99,000 fishermen work on board coastal vessels, while 110,000 fishermen are active on off-shore fleet. It is estimated that about 20% of the employment on board is part time, mainly in the coastal fisheries.
Fish processing
In 2002/2003 the EU fish processing industry employed 147,000 people of whom 35,000 in the North Sea area, 35,000 in the Baltic Sea area, 56,000 in the Atlantic area, and 16,300 in the Mediterranean area.
Aquaculture
In 2002/3 EU aquaculture produced 1.4 mln tonnes valued at 2.8-2.9 bln Euro. It employed some 65,400 people of which 12,000 in the Mediterranean area, 40,000 in the Atlantic area, 1,600 in the North Sea area, and 3,700 in the Baltic area. The principal aquaculture products of the EU are fish (trout, salmon, seabass, seabream), and mollusks (mussels, oysters and clams).

15.2 Employment trends and factors affecting employment

Employment in the fisheries sector is structurally decreasing and does not contribute more than 0.2% of the employment in the coastal NUTS-2 regions.

- Fishing

The number of fishermen has been decreasing since 1996/1997 by 4-5% per year. Therefore, the number of fishermen in the EU-25 (excl. Drom) can be estimated at about 190,000 -195,000 in 2005.

The demand for fishermen is determined by the size of the fleet, the labour intensity of the technology used and the economic performance (profitability) of the vessels. Between 1998 and 2005, the size of the fleet decreased by 24%. This was accompanied by a decline of the number of small fleet fishing of approximately 10-15%. Since the small scale fleet contributes very strongly to employment, this decrease translated into 40% decrease in employment among the fishermen.

In some areas owners of larger fishing vessels have contracted foreign crews from non-EU countries. Hiring foreign crews is not only driven by lack of local crews, but also by the need to reduce labour costs. It is, however, difficult to make a sound estimation of the

number of foreigners who have replaced EU crewmen. A very rough estimate would be approximately 5,000 -10,000.

- Fish processing

The trends in seafood processing differs depending on the region. In the regions that depended on local landings, employment in seafood processing dropped as a result of a move away from primary food processing. This trend is accompanied by the decreasing distinctiveness of the seafood processing and its greater integration in the general food processing industry, coupled with the development of new added value products (such as ready meals). Therefore, part of the employment in the sector is expected to disappear as a result of further consolidation of the industry. Additionally, competition with third countries, with low labour costs, has dramatically increased which has negative impact on prices. It is expected that a larger share of employment in fish processing will be transferred to low-wage countries.

- Aquaculture

The major issues of concern to the aquaculture sector are increasing competition from imports and technological progress. The former results in particular in great price decreases and the necessity to increase productivity, both of which result in reduction rather than the growth of employment. This is further aggravated by the relatively negative image of fish farming (environmental concerns) and the difficulty in attracting younger workers to the sector.

16.0 Sectoral policy discussion; recommendations and examples of good practice

This chapter discusses some of the key policy recommendations for individual sectors within the sea related sectors[I].

16.1 Shipbuilding

Firstly, as the study has identified, an increasingly intense global competition in the shipbuilding industry has put pressure on employment in the sector. Given the heavy dependency on these global trends, it is necessary to continue the present approach towards international trade policy and to ensure the full applicability of the WTO regime to the shipbuilding sector. It is also necessary to renegotiate the OECD shipbuilding agreement on the regulation of subsidies and injurous pricing practices. Since European shipyards are not well placed to compete on price, they increasingly suffer reductions in capacity, output and, consequently, employment if globally applicable trade rules are not implemented[II]. These difficulties were outlined by industry stakeholders and European Commission and national policy representatives in the forum leading to the LeaderSHIP 2015 recommendations.

Since the major competitive advantage of the European shipbuilding industry is its high RDI content, the industry and policy makers must co-operate to ensure the protection of intellectual property rights (IPR). Technological innovation also requires integration and coordination through the creation of technology platforms. The work presently undertaken by the Maritime Industries Forum is a good basis for such an approach.

The sector is also affected by the difficulties experienced in obtaining financial guarantees or credits. For example, Polish shipyards experience difficulties in obtaining commercial credits. On the other hand, the Netherlands have made a significant progress with the introduction of a financial guarantee fund for the shipbuilding industry aimed at pre-financing, which can potentially enable the industry to benefit from increased international demand for new ships. Indeed, the difficulties relating to shipbuilding financing could be eased up through an establishment of an EU-wide pre- and post-delivery financing systems.

[I] General cross-cutting policy considerations are presented at the end of the report.
[II] CESA Annual Report, 2004-2005, p.15

Improving research, development and innovation investment for the sector can also advance the sustainability of employment in the shipbuilding sector. Projects initiated under the 6th Framework Programme are good examples of fostering vertical integration, collaboration and innovation between shipyards and suppliers. A review of the current State aid regimes in the view of innovation aid has also been suggested. In actual fact several European countries, such as Germany, Spain and France have already successfully submitted applications for innovation subsidies to the European Commission. At present, the Dutch employers' organisation VNSI is urging the Dutch government to submit a similar application. With regards to naval shipbuilding, activities that can foster greater collaboration between naval shipyards across the borders in Europe are recommended, as well as a continuous exchange of expertise and information between merchant and military shipbuilders.

The sector faces a range of challenges in relation to employment which need to be addressed through innovative solutions negotiated between social partner and other key stakeholders. These challenges include the cyclical nature of employment, an ageing workforce and increasing skill shortages not only in relation to particular skills profiles but also in certain geographical locations affected by “brain drain” (e.g. from eastern to western Europe). An outdated image of the sector as being one of heavy manual work together with the perception of an industry in decline as a result of past layoffs and the cyclical nature of employment have impacted on the number of young people training for and seeking careers in the sector. As a result, work not only needs to be done to “update” the image of the sector as an innovative one with high technology content, but innovative solutions have to be found to emphasise and ensure security of employment rather than job security and flexible work organisation (a so-called flexicurity strategy). Some work in this area has already been accomplished by social partners, indicating that an exchange of good practice at the European level would be beneficial to share experiences. Examples of good practice include the following:

“Shipyard Week”, as well as Waterborne Technology Platform organised by the sectoral social dialogue committee is a good example of an initiative aimed at addressing the image of the sector. The Shipbuilding Social Dialogue Committee is also involved in a project with the European Foundation for the Improvement of Living and Working Conditions to look at instruments to manage cyclical changes in the industry and to build a portfolio of good practices. Challenges created by project orientation can be partly overcome by promoting exchange of workers. A recent German initiative, called Employment Pool, has done exactly this. It addressed the problem by securing access to qualified workforce through an agreement between companies to exchange workers and thus adjust more easily to cyclical demand in the global market.

Due to the ageing workforce in the sector, there are initiatives aimed at retaining older workers who possess considerable experience and knowledge. However, in spite of the high tech input in the shipbuilding industry, some of the tasks still require physical strength and thus older workers cannot perform them. In Germany, there is an initiative aimed at internal redeployment of older workers to retain them in the company[I]. In Finland, although the average retirement age is 59 the Aker Finnyard HR management is trying to raise it to 62 or 63 by re-engaging older workers mainly in the process of teaching the younger ones and passing on the culture of good working practices[II].

This review as well as a study carried out by Tholen and Ludwig (2006) indicate that many shipyards in Europe are experiencing skill and labour shortages. Skill shortages raise doubts as to the capacity of the European shipbuilding industry to effectively compete and to take advantage of the increased demand for new ships. Therefore, the industry has to ensure access to a skilled workforce through the identification of future skill needs. Sectoral social dialogue at European level can play an important role here. At the Member State level the Netherlands has already adopted a more systematic approach to identification of skill needs in the shipbuilding industry and designing appropriate training courses. VTL, a centre for expertise in vocational training and labour markets, has been working with employers, trade unions and training institutions in the development on competence-oriented vocational training for 58 skill profiles in the shipbuilding sector. The testing phase will last from 2005 to 2007 and first courses are scheduled to begin in 2008.

The quality of training can be an issue, but in many countries the sector is already working closely with colleges and universities to improve linkages between the sector and the research community. In Germany, shipyards offer placements to pupils in their final year of school as well as to engineering students in the hope of attracting them to the sector. Shipyards also work closely with universities to help develop the curriculum not only in engineering but also computer-assisted design and other IT functions.

In addition to making sure that qualifications are meeting the needs of the industry, these must be accompanied by lifelong learning programmes in order to ensure a culture of learning and the ongoing updating of skills. In Spain ESF funds have been used to help set

[I] See also: Bloem P., Human Resource Management as a way of Maintaining and Enhancing Productivity, Qualifications and Learning Aptitude, in Times of Demographic Change, in: Qualification and Training Forum, European Shipbuilding Social Dialogue Committee, 21 October 2005, Trieste, p.21

[II] Helin A., *The On-The-Job Training Experience at Aker Finnyards, Turku*, in: Qualification and Training Forum, European Shipbuilding Social Dialogue Committee, 21 October 2005, Trieste, p.23

up different training schemes to ease adaptation to new technologies and to ease transferability of workers to related sectors. These courses reached 20,000 people during 2004.

Furthermore, since training is usually regarded as a cost, there is a need to encourage training in the industry and increasingly highlight the benefits of training such as increased productivity and better quality[I]. In France, the focus on competence development and better career planning has been the focus of the Carrières 21+ project, which allowed workers to better position themselves within Chantiers de l'Atlantique through managing their own individual skills. The project also took account the employees' contributions and potential for advancement, as well as their opinion on their career progression. The project was preceded by an exercise in job and skills mapping. Since work in the shipbuilding sector is becoming increasingly project-oriented, one of the skills necessary is the shipbuilding-specific management and project-management. Currently the marine education and training market is estimated at 0.5% of the total market value of the marine sector[II]. It is therefore necessary to increase the promotion of the sector as a high technology industry and ensure incentive funding for companies to make training more attractive to them.

16.2 Marine equipment

As mentioned earlier, the marine equipment sector has historically speaking been lacking a clear definition and consequently systematic collection of data on employment. In fact, the fragmentation of the sector also makes the industry slightly less visible and its socio-economic impact is not as widely recognised in some Member States as it has traditionally been seen as 'indirect employment in shipbuilding'. However, this situation is changing with the industry today having 10 national level representative organisations and a European level representation. Furthermore, a definition for the sector has now been adopted by the European representative association for the sector (European Marine Equipment Council).

This report has also dealt with difficulties in accessing economic impact and employment data due to the marine equipment companies being active in many different sectors (not always entirely related to the maritime sector) and the commercial sensitivity of employment data. With these challenges in mind, the first step forward could be to establish the core business areas and closely monitor employment in those sectors, leaving estimates for the areas where data is less available. Employment data has already

[I] EMTA
[II] Marine Labour Market Observatory, EMTA

been systematically collected for the sector in Denmark and the Netherlands and there are lessons to be learnt from those studies and methodologies.

The shift from a congested land transportation system to a more environmentally sustainable waterborne traffic system strengthens the job generating position of the industry. The sector should therefore concentrate investment on growth areas, for example, equipment for shipping gas, LNG carriers, gas treatment technology and security-related solutions. The importance of automation is increasing too, and the export market has boosted the scale and size of some companies in the industry. Environmental regulations can also trigger the potential for employment growth in this segment of the marine equipment industry - if the regulations are properly enforced. Given the marine equipment sector's high interdependency with the core maritime cluster, shipbuilding in particular, again fostering inter-sectoral collaboration on research, innovation, employment, education and training is recommended. The future competitiveness of the industry is directly dependant on innovation and highly skilled employees. For example, a skills shortage of engineering operators, designers and technicians continues to act as a barrier to technology innovation in the UK. Thus education and training policies should aim to identify and then respond to the current and future needs of the sector. Moreover, as with the shipbuilding sector, it is also necessary for the marine equipment industry to promote its image as a sector with a high degree of high technology content in order to attract young people.

This study recognised that many companies in the sector do not yet sufficiently co-operate with universities and the latter are not sufficiently market-oriented. This results in problems in turning innovation into a product. Such co-operation should be improved. Indeed, one of the targets of the WATERBORNE Vision 2020[l] is to strengthen the cooperation between the universities and the industry and allow for a better transfer of know how and technology from other sectors. Some actions have already been taken at Member States level to advance this co-operation. For example, the Maritime competitiveness centres in France are clusters of companies, training centres, universities, ministries, local actors and public and private research centres involved in a partnership intended to create synergies around common innovative, high-technology maritime projects. It is also critical to ensure the industry and the academic sector in Europe can retain and maximise the usage of national scientific assets which impact on the sector.

Companies in the sector could do more to benefit from technological developments in non-maritime fields and apply them also to the marine equipment sector. Key industries for

[l] Waterborne TP was launched in January 2005 and is a forum where all sectoral stakeholders are working to agree to Vision 2020, to assess the key challenges to the maritime industry and waterborne transport and to formulate necessary R&D initiatives (under Waterborne Strategic Research Agenda).

collaboration include capital intensive construction, automotive, rail and aerospace. But as already indicated, investment generation in long term R&D continues to be difficult due to the high number of SMEs operating in the sector. Horizontal networking between companies, in addition to vertical co-operation with other industries, can assist this process. A recent example of action on this front is the establishment of a R&D working group by the European Marine Equipment Council.

As in the case for the shipbuilding industry, the European marine equipment industry is also calling for a better enforcement of legislative frameworks that protect intellectual property rights. This is to protect European knowledge and know-how and particular that of SMEs, which can contribute towards sustaining employment in Europe. The European Marine Equipment Council is also calling for consideration to be given to the expansion of the Marine Equipment Directive to include harmonisation of classification rules and allow mutual recognition of certificates and - last but not least - facilitate competition between classification services.

16.3 Seaports and related services

Firstly, more accurate and reliable information on the levels of employment is needed as an essential tool for policy development for the industry and to assess the wider economic importance of European seaports to the European economy.

The port liberalisation programmes, increases in the need for ports as wider transport logistic centres and a growth in container traffic have been the traditional factors affecting employment in the port sector. Global port activity is set for long-term growth. Therefore overall European transport policy plays an important role in determining employment levels in European seaports, for example through investments in port capacity and tackling growing land transportation congestions. Some Member States are already trying to tackle this through considerable investments to expand port capacity and to improve maritime access and hinterland infrastructure as a way of avoiding congestion. For instance, annual investment in ports in Sweden has increased from 200m SEK in 1993 to an average of 1 billion SEK per year since 2000. Investment in Swedish ports will continue in the next few years, with 6 billion SEK already allocated for investments between 2005 and 2009. Similarly, Spain has announced a plan to spend €23bn on the maritime and port sector over the next 15 years (to 2020) – the proposal particularly aims to boost short-sea shipping[I].

[I] Marine Industries Global Market Analysis (2006) Douglas-Westwood

Promotion of and subsidies for short sea shipping was forecast to have the potential to create employment in more peripheral economies and coastal regions of Europe[CLXXIII]. Indeed, FONASBA/ECASBA actively promotes and supports the development of short sea shipping as this would increase employment in ship brokerage and agency in smaller ports that currently do not benefit as much as the larger ports. However, the trade unions have claimed that short sea shipping has not succeeded in creating employment for EU seafarers, or even for dock workers, to its full potential.

Local and national policy responses dealing with a growth in the cruise tourism market have also the potential to generate employment opportunities in the sector.

A proposed Directive on market access to ports services[CLXXIV] was rejected by the European Parliament in January 2006 and has subsequently been withdrawn by the European Commission. The so-called Ports Package II was intended to increase competition in the ports sector and would have liberalised port services by permitting firms to appoint independent contractors to load and unload ships. It also would have ended terminal operators' monopolies on cargo handling. There was widespread industry opposition to the proposal, with trade unions fearing the destruction of dock workers' employment and social dumping practices, whereas in the eyes of some employers' organisations the liberalising provisions of the proposed Directive did not go far enough to open up the market for services.

In respect of maritime pilotage, reports have shown that many European countries are facing growing difficulties in finding qualified applicants for pilot services. This is largely linked to fact that there are decreasing numbers of experienced officers and masters. However, a number of intensive recruitment campaigns have been able to reduce the labour shortage to some extent, but it remains difficult to replace pilots who take retirement or to account for the increased traffic[CLXXV].

A number of countries have also expressed their concern over wider skill shortages in the seaport sector. For that reason, this section will look into two examples of the way in which skill (and labour shortages) in the port sector have been addressed in two European countries – before having a more general discussion on lessons learnt on training in the port sector.

The first case study explains how the Spanish sectoral social partners have been able to improve the level of training and employment in the ports sector through the development of new competence management tool. The second case study looks into the port of

[CLXXIII] Marine Industries Global Market Analysis (2006) Douglas-Westwood
[CLXXIV] COM (2004) 654 final
[CLXXV] EMPA

Antwerp where, as early as 1980, employers set to an education centre (OCHA) to ensure that all employees in the port of Antwerp have received initial training and approval by the institute.

Case study 1 – the Spanish collective competence management model for the port sector

Due to the legal changes introduced during the nineties, the Spanish Ports of General Interest began to play a more important role as economic agents with autonomous decision power in a market that was increasingly less regulated. These legal changes in conjunction with a period of economic expansion and the growth of marine traffic have affected the Port system's composition and organisation.

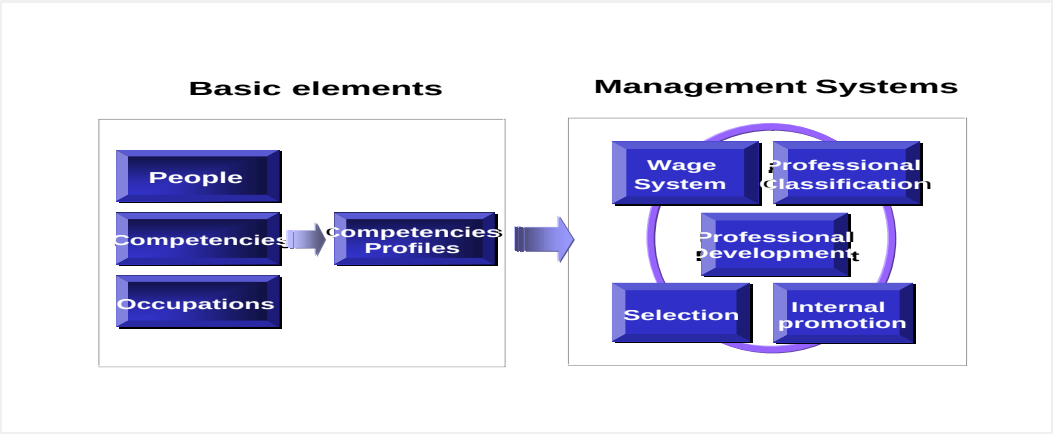
Nowadays port management demands a trained workforce to respond to the challenges of modernisation. However, until now, the demand for labour in the Spanish port authorities has not been matched by appropriate training supply as the average training of the workforce has been relatively low. Furthermore, the sector is currently experiencing labour shortages. The root of the problem was the existence of a "fragmented" and "out of date" professional classification that did not reflect the real situation and needs of the Ports. As a consequence, some activities had to be sub-contracted to third parties. The Local Collective Agreements also contributed to a situation where the same occupation was paid differently depending on the port authority. Salary progression could only be achieved through a change of jobs. This generated a lack of motivation and acted as a barrier to progression for the workforce.

The First National Collective Agreement for State Ports and Port Authorities dealt with continuing training but not in great depth. The training provided did not respond to a clear objective and structure. The consequence in practice was different treatment of workers and companies depending on the location and their capacity for autonomous planning and action with regard to training and wages.

As a response to this situation, the Second National Collective Agreement for the State Ports and Port Authorities (2004-2009) included a new system of training called 'competence management'[CLXXVI]. The Collective Agreement was signed by the social partners in 2004 but it took another year to get the Agreement approved by the Spanish Government. The delay was due to financial considerations and the fact that it was a completely new system.

The Port System has been facing the challenges of combining growth, competition and productivity. The social partners recognised the need for the modernisation of the job classification, competence development and career progression system. The model applied was developed by a consultancy called Soluziona and is based on the identification and definition of "competencies profiles" in terms of both occupations and organisational needs and defines a framework for handling the processes. The model provides a classification by occupational group and an evaluation of the competencies required. The management and planning processes are optimised by addressing the tension between the demand and the supply of specific competencies. The use of profiles and competence assessment also optimises the activities.

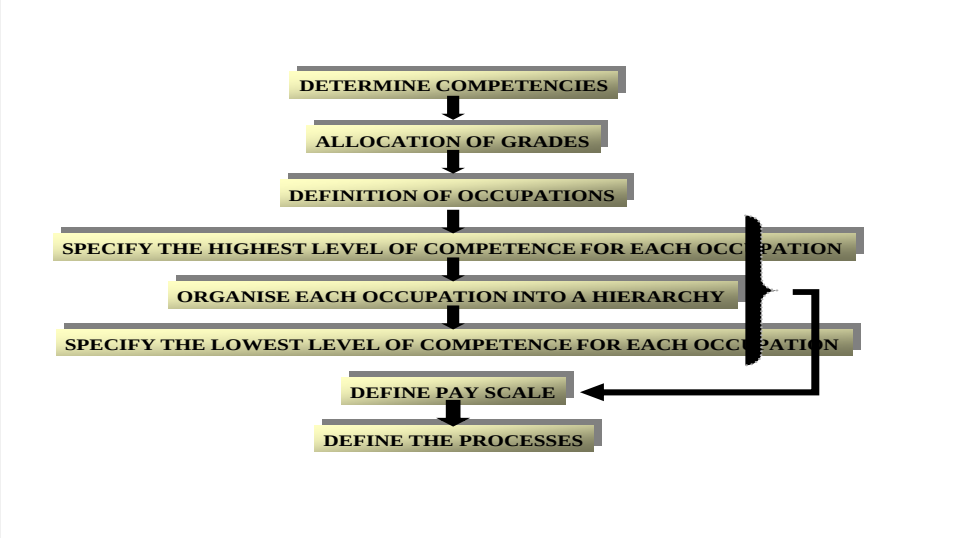
Competence model



Source: CC.OO Presentation, Application of the Competence Management Model, Sept. 05

The initial study was carried out by Soluziona identified the different competencies needed in each port authority, defined the occupations and the level of competence for each one. The social partners then agreed the definitions, hierarchy, pay scale and processes. The diagram below illustrates the process followed to develop the model.

Development of the model



Source: CC.OO, Application of the Competence Management Model, Sept. 05

The "Directory of Competencies" contains and organises the 30 technical competencies and 6 generic skills identified and defined for the State-owned Port System. The "Catalogue of Occupations" contains all the occupations/jobs existent in the Spanish ports. The occupations are then categorised into Professional Groups

[CLXXVII] CC.OO, Valoración representación social a nivel local y estatal.
[CLXXVIII] Interview with Mr. Antonio Escobar, General Secretary of the Trade Union Section Intercentres of the Spanish state-owned Ports and Port Authorities, CC.OO.

(skills, qualifications and general cover). Each group is also divided into Occupational Bands. The model also defines very detailed and separated processes for the promotion by levels, internal and external promotion and professional development.

This model is not "static", it evolves over time to reflect changes in the competencies required for each occupation and the organisational needs of the companies. Any changes will be reviewed, in the first instance, by the State Commission for Competencies (Comisión Estatal de Competencias). When the change is agreed and signed, it will then be considered by the Local Commissions in each Port where the social partners are also represented.

With regard to the provision of training, the State Commission will approve each year the general guidelines for training and priority groups and then make some specific recommendations. Each Local Commission will then decide how to allocate the resources based on the needs identified by the companies and the port authorities. This model allows flexibility to respond to the needs of each port in order to balance local supply and demand.

This continuing training programmes will be co-financed by the national fund for vocational training and companies, with the latter paying a proportion of the total costs of the training according to their size. The training is delivered by social partners and companies.

The initiative has recently come into effect and the Trade Union Confederation of Workers' Commissions (Comisiones Obreras, CC.OO) has already highlighted some expected benefits that can obtained through the correct implementation of the model[CLXXVII]:

- Movement towards a more inclusive and participative management style
- Workers better trained, multi-tasked and motivated
- Major profitability of labour costs (workers are seen as an asset for the company not a cost)
- Simplification of processes and time
- Better adaptability and flexibility of the workforce to the organisational needs
- Increased internal promotion
- Promotion of personal development
- Reduced sub-contracting costs
- Clear improvement on the motivation of the workforce and their involvement in the company objectives.

This system does not imply a change in the way of working; it basically stimulates the professional development of the worker and improves the possibility of career progression, matching their professional profile to the job through training and pay awards. The model allows an assessment of existing competencies and competence gaps for each employee which can then be addressed with structured training and professional and personal development.

This new system also recognises the value of continuing training for personal development and career progression. The re-classification has had a positive impact on an estimated 50% of the workforce that has seen their salaries increased. For the remaining 50%, the chances of professional development have been vastly improved. In this respect, during the first year of implementation, the State Commission has prioritised the training needs of those who have not experienced the re-classification of their jobs[CLXXVIII].

CC.OO has already expressed a general satisfaction with all the developments. However, in hindsight, they would have liked to see a greater involvement of social partners (trade unions and people responsible for

human resources) in the initial stages of the study carried out by Soluziona. This would have avoided some issues that cropped up during the negotiation such as the exclusion of trade unionists and some technical categories.

With this agreement, social partners and the public administration are pursuing an increased involvement of trade unions and employers' organisations in the development and implementation of a more effective training system for workers and companies and a clear identification of professional categories to reinforce and improved the social dialogue in the sector. Provision of such model as a result of collective bargaining has been seen as a positive outcome to help offset the problems created by the current skill and labour shortages in the sector.

Moreover, this is the first collective agreement in the sector that addressed the exclusion from training previously faced by trade unionists. This refers to specific training for trade union representatives to fulfil their tasks as union representatives. This obviously had an effect on their professional career and possibilities of promotion. It is the first time that, "employers acknowledge trade unions as part of the company and recognise their contribution"[III]. The competence management model includes and recognises the "trade union representative" as an occupation with specific competencies and training needs.

Case study 2: Addressing skill shortages in the port sector in Belgium

The four Flemish seaports are of great economic importance to the country, with a total added value of €11.5 billion. The port of Antwerp is the largest port ranking third in Europe and eleventh in the world – followed by the ports of Ghent, Zeebrugge and Oostende. The supply of skilled labour for the sector is therefore not only important for these seaport cities, but to the overall maritime cluster and indeed, the economy of the country. In order to ensure a sufficient supply of skilled labour, as early as 1980, employers set to an education centre (OCHA) to ensure that all employees in the port of Antwerp have received initial and ongoing training and approval by the institute.

In this way not only the needs of employers would be addressed in the best possible way, but also the risk of accidents would be minimised. This case study looks more closely at the training provided by OCHA as well as the collective agreement from 1988 that ensures extra funding for training in the seaport sector.

In 1980, the OCHA training centre was set up by - and continues to be jointly managed by the social partners in the Belgian port of Antwerp: the employer organisation CEPA (Centre of employers of the port of Antwerp) and the labour unions active in the transport sector ACV, ABBV and ACLVB[I]. In the joint management board, the chairman is from the employer organisation and 6 mandates are given to the labour unions and 6 mandates to the employer organisation. Other Belgian ports have other arrangements. For example, the port of Zeebrugge does not have a training centre, but has an agreement with other education institutes to provide employees working in the port of Zeebrugge with practice-oriented training.

The initiative to set up the training centre was taken during joint discussions on how to tackle accidents at work in the port sector. Social partners decided to start by offering basic health and safety training for dock workers to reduce the risk of accidents. The OCHA Training centre started with 2 teachers, but has since then expanded greatly and currently employs 34 teachers and 5 administrative staff. The administrative staff are

[I] This section is based on a interview with the director of OCHA and the website www.cepa.be.

recruited by the employer organisation, the teachers are ex-port workers and in most cases are put forward by the unions.

Currently, the training centre offers professional training to employees and job seekers to qualify as port worker[CLXXXI] and offers specific vocational training to port workers[CLXXXII]. All employees working at the port must be qualified by the institute and training is organised to ensure the supply of qualified personnel and to reduce accidents at work.

The OCHA Training Centre is 95% funded by the port employers and 5% by the Flemish Employment Service (VDAB-Flemish Community). This means that the port sector employers clearly exceed their legal requirement to fund education within their sector (sectoral development funds, CAOs)[CLXXXIII].

When looking at outcomes of the training centre, in total it is estimated that around 25,000 persons have been trained since 1980 (25 years in total) [CLXXXIV]. At the start in 1980, the annual number of employees receiving training was low, but it has been increasing rapidly. Last year, 2400 persons received training (this includes training of 3 to 4 weeks and 1-day training courses). The graph below gives an overview of the number of persons who received the basic training from 1980 to 2002.

Annual number of persons receiving basic training for port workers at the OCHA Training Centre

[CLXXXI] In Belgium, all port workers need to have a qualification to work in the port. They fall under a special statute of "port workers".

[CLXXXII] It is important to note here that the employees and jobseekers need to be a member of one of the labour unions in order to subscribe for training.

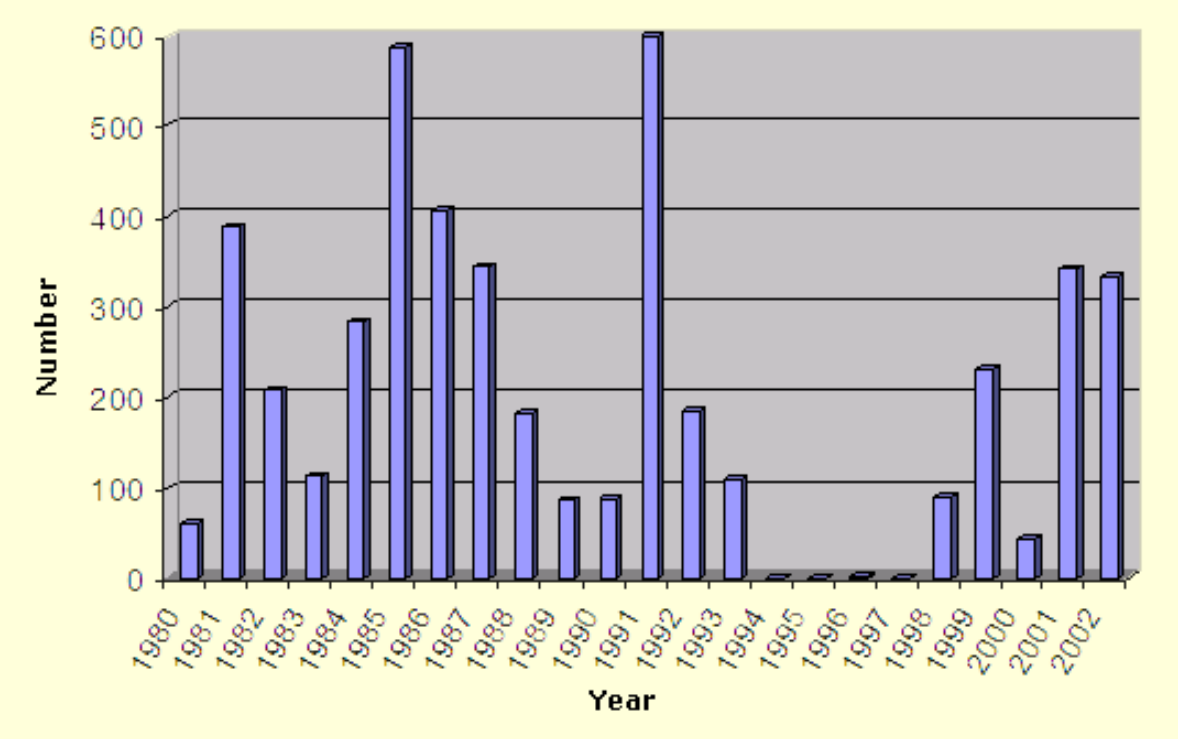
[CLXXXIII] Sectoral development funds in Belgium promote education and training in different business sectors with the aim of addressing the most acute skill shortages. This education is often – but not exclusively - organised through the set up of sectoral development institutes (vormingsinstituten).

The sectoral development funds are funded through collective labour agreements (CAO). The Inter-sectoral Agreement of 18 November 1988 can be seen as the catalyst for the expansion of the sectoral development funds and institutes in Belgium. In this Agreement it was decided that employers within a specific sector should yearly contribute a certain percentage of their total spending on salaries to a sectoral development fund, used for the employment and education of groups at risk (unless the employer already organises other initiatives on sector or company level to integrate/employ risk groups like ethnic minorities, elderly, young people, etc.). Since that date, in 80% of the business sectors joint agreements have been developed with respect to the employment and education of groups at risk, which means in 10 years time (between 1988 and 1998) the set up of approximately 500 development CAO's . Today there are approximately 20 different sectoral development funds in existence in Belgium. In recent years, the sectoral development funds and institutes have evolved from orienting solely on training, to a more holistic approach by becoming think-tanks where sectoral know-how and expertise are increasingly bundled together to connect demand and supply in the sector-specific labour market. Belgium is together with the Netherlands (where these funds are called education and development Funds –O&O funds) and France, one of the only European countries in which these sectoral educational initiatives have been developed.

[CLXXXIV] This section is based on a interview with the director of Ocha, Guy vanKrunkelsven and the website www.cepa.be.

[CLXXXV] Collective labour agreement 13-06-2005, website http://meta.fgov.be/pdf/pk/30101/30101-2005-002825.pdf

[CLXXXVI] In the Port of Antwerp, a distinction is made between port workers and logistical port workers. Port workers receive a basic training of 3 weeks, while the logistics port workers only receive a course of 1 to 3 days.



Source: www.cepa.be

Training of the OCHA Training Centre includes the following:

- Basic training in port-related skills.
- Specialisation courses for specific categories
- Sector-specific education in terms of H&S (e.g. handling dangerous goods)
- Business management training
- Simulator training on how to handle cranes etc.

Training courses are permanently under evaluation and adjusted to the sector specific needs. In recent months, training has specifically focussed to the reintegration of particular target groups like young people and older port workers who have been experiencing placement difficulties. Also, attention is given to the increased technological expertise needed in the Belgian ports. Consequently, increased focus is given to educating lower skilled workers threatened to become long-term unemployed due to their skill gaps[CLXXXV]. One of the current weaknesses is the lack of specific training offered for logistical port workers[CLXXXVI]. Also, currently no training is offered for electricians & vehicle mechanics working in the port of Antwerp.

16.3.1 Lessons from case studies on training in the port sector

Skill shortages in the seaport sector are generally more difficult to describe and capture than for example in the shipbuilding industry. This relates to the significant variety of tasks and the skill levels required by different occupations related to this sector. In some areas skill shortages can be occupationally and geographically specific. However, there is a recognised European wide shortage of logistics personnel, largely due to the rapidly changing nature of this skills profile in this sector. There is therefore a particular need to

link business with workforce planning and ensuring, as indicated in the good practice examples above, a strong link between social partners and training providers to ensure training is regularly updated to meet the needs of the industry.

The case studies also highlighted a number of lessons in terms of training in the port sector:

- Policies aimed at tackling skills needs amongst workers in the ports need to take into account the importance of learning towards competence development and the integration of learning with work. They also need to show flexibility to take into account the organisational and contextual needs of each individual port. It can not be forgotten that the European seaports are very diverse.

- Workers need to be well informed and aware of learning opportunities offered by the Port Authorities and information on how to access them.

- Policies for promoting quality in training for the sector should be developed in consultation with social partners and integrate incentives to make employers and employees aware of the role of training for job performance and professional development.

- Policies should be based on new forms of recognition between the training world and the productive world in order to balance supply and demand and meet the organisational needs of companies and the challenges faced by ports.

- There needs to be a shared business vision and the strategic priorities and plans should be understood across the companies in order to face the challenges of growth, productivity and competition in the port industry.

- One of the main success factors of the Belgian system is the fact that they are able to use and fully exploit the know-how present within a specific sector for development and training. The OCHA Training Centre hires former port workers and experienced (port) engineers to teach.

- Training schemes must be easily adaptable to the changing needs of the industry.

16.4 Recreational boating

This study has clearly already found that in most of the EU member countries there are large gaps in the collection and analysis of employment or indeed economic impact data

for the recreational boating sector. This is partly because some countries have not realised the full economic potential of this sector. ICOMIA has responded to this by recently commissioning Michigan State University to undertake an economic benefit study. Specifically, this study will investigate how statistics in this industry are currently collected in its member countries and try to identify a common set of definitions for the industry to aid future data collection.

Similarly, the sector is fairly rarely seen as one 'policy area' by national public authorities. The industry is often viewed as a part of the recreation or manufacturing sectors. The Flemish authorities have become increasingly aware that water recreation is an important catalyst for economic growth and employment especially in the Flemish region. Consequently, the key actors in Flanders have recently collaborated in the development of a policy plan for water recreation and tourism (aimed at the waterway regions and coast of Flanders)[CLXXXVII]. This plan focuses mainly on sustainable recreation, and aims to increase the economic importance of the recreational boating and tourism industry.

The future competitiveness of the European recreational boating industry will depend on companies' abilities to reduce overheads and where possible not to rely solely on the national markets, but there is also an increasing need for governments to relax the regulative burden on companies and consumers; the multitude of regulations places a disproportionate burden on SMEs, which currently make up 98% of businesses in this industry. Given this high proportion of SMEs, there is also an immediate need for business support in terms of innovation and R&D.

One of the main threats to the European recreational boating industry is that manufacturing may be lost or outsourced to China, or other emerging economies in the Far East, where labour costs are significantly lower. Similar cost pressures are being faced from large US corporations which are buying up smaller companies in certain sectors. As a result it is essential for the sector to hold on to the high skill base of its employees in order to hold on to its competitive advantage, as is also the case with many other maritime industries. However, both the European industry representatives and national level interviews found that in many member states businesses in this industry face challenges in recruiting, training and retaining a quality, skilled workforce. Smaller businesses often also lack a corporate structure and experience in growing and marketing a business, particularly internationally.

[CLXXXVII] WES, CIBE, CDR (2003) *Development of a policy plan for water recreation and tourism on the waterways and coast of Flanders, final report, resource analysis*, study for the Ministry of the Flemish Community, Policy Division for Harbours, Waterways and Sea

As a response to these challenges the Irish Marine Federation recently started to run a programme called Flying Start that provides management training for employees in the recreational boating industry. This programme is operated with European support through INTERREG. Currently the first phase of the training is under way with 15 students taking the course leading to a certificate in marine leisure management. The course is focussed on equipping the participants with skills in operations management, marketing and e-business.

Likewise, as a consequence of the lack of commercial skills in the Finnish recreational boating industry, Finnboat, the representative organisation of the Finnish recreational boating industry, has, in collaboration with public education authorities and a private training institute developed an official management programme for the boating industry workers, which leads to a nationally recognised qualification. The course is based on competence-based examination system and intensive short training courses, with the aim of improving commercial management, business expansion, language, customer service, sales and marketing skills of employees and managers in the industry. The education includes 1-2 day blocks of training, which is tailored to the particular needs of each participant on the programme. Each student is also provided with an individual development programme with tasks that can be carried out in the workplace, and that supports both personal and organisational development needs.

Both of the above mentioned training programmes are currently being implemented, therefore it is not possible to make judgement about their success as such. However, they are good examples of industry representatives aiming to improve overall competitiveness of the businesses in the industry. It would be recommendable for the European level actors to follow-up implementation of these programmes and more widely disseminate results and successful elements of each programme to actors across Europe. The problem however remains in more technical skills that are often too specialised to be learnt in mainstream education programmes and heavily rely on 'on-the-job training'. The Irish Marine Federation co-operates with the British Marine Federation by 'buying' trainers from the UK market. Indeed, European level co-operation in this field is highly recommendable as the training requirements, apart from more general business skills, are so specialised. Many of the tasks in boatbuilding businesses are so specialised that no education or training provision exists even at national level.

16.5 Shipping

First and foremost, an efficient European maritime transport system is the backbone of the functionality and economic competitiveness of Europe. In order to ensure efficient maritime transport system within Europe and to safeguard employment in this sector, efforts must

be focussed on removing bottlenecks from the wider transportation system in Europe and on ensuring the efficient functioning of the port system. This should be regarded as a basis for any policy developments.

The second recommendation relates to the complexities of creating sustainable employment in the sector. Employment trends identified in this report clearly chart a decline in overall employment and particularly in the employment of European seafarers in the sector. This particularly applies to extra-community shipping operations. Similar to the shipbuilding sector, shipping therefore suffers from an image declining employment for EU nationals as well as image problems related to what are perceived to be poor working conditions relating to long absences away from home and difficulties in dealing with often different working conditions applied to multi-national crew. These complex factors have led to a decline in EU seafarers training for careers on board ships, high drop out rates from training and poor retention rates. It is important to address such emerging skill shortages not only to ensure the competitiveness of the European shipping industry but also of the wider maritime cluster, as it is widely acknowledged that the skills of former seafarers are highly valued for employment on-shore.

As in the shipbuilding industry, policy approaches to dealing with the shortage of EU seafarers and officers in particular must be multi-faceted in the full understanding of the above mentioned challenges. The situation in the shipping sector differs from that in the shipbuilding industry in that it is generally a sector where demand is likely to increase in future. On the other hand, there is a greater challenge from the recruitment of non-EU staff in this sector, an issue rendered more complex by the weak implementation and enforcement of existing rules and legislation (in global terms) relating to living and working conditions of seafarers of different nationalities on different flag carriers. This report did not address in detail the difficult question of working conditions on board vessels, but the research made clear the complexity of the debate with shipowners arguing against the application of EU working conditions on board vessels flagged to EU member states or the application of rules that make employment of European seafarers compulsory for fleets flying EU flags. Such regulations are considered to prove counterproductive for the promotion of employment among European seafarers as it is easy for shipowners to flag out. Instead shipowners are supportive of the enforcement of global regulations on employment and any initiatives to boost the attractiveness of employment on sea. They are also in favour of maritime cluster approach, which they have found particularly successful for example in the Netherlands, and that further promotes the idea of a long term career in the maritime cluster.

Trade unions on the other hand are concerned over the preference of shipowners to employ seafarers from third countries with the effect of loosing important maritime skills

from Europe and raise concerns over equality in employment terms and conditions between third country and EU nationals.

In this respect it is, essential to try to aim securing the ILO Consolidated Maritime Labour Standards as soon as possible and to ensure the full implementation of the standards by all parties.

As well as addressing the issue of payment terms and conditions of seafarers, it is also important for social partners to look at working conditions on board vessels which are considered to make the sector less attractive – including long absences away from home. While some of these are indeed inherent in the nature of the sector, new ways of addressing work organisation and work patterns may well contribute to improving working conditions and therefore raising the image of the sector.

An improvement of the image of the sector should be encouraged by promoting the positive aspects of the industry among school and college students, by giving out information about the high tech aspects of the industry in order to change the perception of the industry as an 'old-fashioned industry and by promoting the lifetime career progression route in the maritime cluster. The Council conclusions[l] on boosting employment prospects in the maritime sector (05/12/2005) contains an annex of examples of good practice in tackling the problems around unattractiveness of the seafarer profession as well as the image of the shipping sector. Some of the good practice examples are presented below.

A portrait of successful methods for improving attractiveness of the shipping industry

Public events such as festivals, job and education fairs

- Each year a Sea Festival takes a place in Klaipeda on the last week of July. The goal of the Sea Festival is to make the sea popular and to strengthen Lithuania's image as a sea faring nation.
- The Cypriot Shipping Council organised for the first time the "Day of the Sea " event in 2004 with the aim of increasing public awareness of the shipping Industry in general and at the same time to promote the image of maritime employment both onboard ship and on shore. More than 4,000 attended the event.
- The yearly "Sea fest", supported by local authorities, is celebrated by the people of sea towns and villages all over Latvia. The celebrations attract lots of Latvian and foreign tourists and are widely publicized by all Latvian media.
- In Denmark, during education fairs, the maritime education institutions are exposed to about 40,000 to 50,000 young people who are attending these fairs each year.

Promoting long term career prospects in the maritime sectors

- The European Commission runs a campaign promoting the wide variety of career opportunities in the maritime transport sector and their transferability to shored based maritime related industries http://ec.europa.eu/transport/maritime/careers/prospects_en.htm
- The Commission has also sponsored a research project on maritime education and training – both to promote & upgrade the quality of maritime education and training programmes, and to ease the transition of former seafarers to an employment within the maritime clusters ashore http://www.iamu-

[l] http://www.eu2005.gov.uk/Files/KFile/eu2005_CC_Transport_Maritime_05dec.pdf

A portrait of successful methods for improving attractiveness of the shipping industry
edu.org/generalassembly/aga6/s3-ketchum.php
Education curricula and vocational training programmes • The Greek government and the Union of Greek Shipowners have prepared a vocational education programme for secondary school students, including a specific book on the seafaring profession as well as specific electronic material. • Investigations by the German Shipowner's Association show that many young persons are interested in a maritime career, but are not alerted to opportunities to undertake it. Therefore, it runs a campaign in association with the organisation responsible for maritime initial vocational training (called Berufsbildungsstelle Seeschifffahrt – BBS), to inform young people. The Federal government and the governments of the five coastal Länder are members of the BBS. There is a full time staff member of the German Shipowners' Association dedicated to promoting seafaring jobs at schools and at job fairs.
Recruitment strategies • Maersk recently reassessed its recruitment strategies, and decided to ensure that anything it did to attract young people to consider Maersk needed to fall into the following three categories. ➢ Be open about what a job in Maersk entails ➢ Only use cadets or junior officers to talk to potential recruits ➢ Go where the potential cadets go
Competitions • School Challenge (UK) targeted schools by organising activities on a maritime theme in which the pupils were actively involved. The activities were integrated in the school curriculum. The aim was to encourage children aged between 5 and 18 to undertake a project – either independently or in groups – over the course of several weeks. This project had a specific maritime theme, and was fitted completely within the existing curriculum. Furthermore, the Schools' Challenge built links between schools and local businesses. Young people are put in touch with contacts within the maritime industry, and receive advice, help and mentoring by maritime business people.
Information and awareness raising campaigns • In conjunction with the Maritime Academy, dredging, tugging and fishing sectors and Promotie Binnenvaart Vlaanderen, the Belgian Shipowners' Association has come up with a promotional campaign, based around the website www.areyouwaterproof.be. The website gives links to all maritime sectors and all educational establishments in Belgium, and is constantly updated. This campaign has a single brand identity. • Since 2002, the Irish government, through the Irish Maritime Development Office has been carrying out a progressive 'Careers at Sea' programme to improve attractiveness of the sector. The target group of this programme has been schoolchildren and they have been communicated that a seafaring career is well paid, and they have also tried to promote the high-tech working environment of new vessels, etc.
Ambassadors • In Denmark, maritime students are trained and used as ambassadors for the industry, supporting the story line personifying an industry in growth and with a strong potential for a future career. The ambassadors are encouraged to participate in student counselling activities at their old high schools, giving lectures on their job, career etc. in primary school. More experienced seafarers join in these activities. There are about 330 lectures each year for pupils in primary schools in Denmark.
Financing skill supply • The Dutch Maritime Network aims to provide a mechanism whereby its members can pool resources they wish to devote to educational and recruitment activities – thereby saving money on duplicated activities. The Maritime Network is also investigating how to develop Training and Development funds in the maritime sectors where these are not yet present. • Most Spanish shore-side positions are filled by people with specialist training, rather than by ex-seafarers. Skills relevant to shore-side careers are taught at higher educational institutes. Professional organisations (e.g. Colegio Oficial de Ingenieros Navales) offer financial incentives to attract young people with brilliant results in the Secondary School to follow the relevant university studies.

A portrait of successful methods for improving attractiveness of the shipping industry
Taster sessions / open days • The training ship "Danmark" (built in 1933) has been used as a platform giving 9th graders (pupils from last year in primary school) from all over Denmark one week as ships officers. During this week the pupil were introduced the educations for ships officers and shipping traineeship – stressing that the maritime industry is also shore based.
Promotion re-entry of women, unemployed and other labour sources • In 2002/2003, the Dutch Ministry of Transport developed a refresher course for Dutch ex-seafarers who were considering returning to sea update their qualifications. The Dutch seafarers union (FWZ) obtained public and private funding to launch such a course. In total more then 800 former seafarers indicated that they were in principle interested in retuning to sea service. From this group more or less than 300 were selected to take up their former profession again.

These initiatives that have been identified as demonstrating 'good practice' and have used different channels of communication according to the target groups. The campaigns aimed at young people tended to be either 'traditional' campaigns in press and TV (mostly regional and local) as well as print materials, but the Internet is becoming increasingly important as a source of information and as a promotional tool. Also, some campaigns were using such channels as cinemas and outdoor advertising (billboards, posters). On the other hand some cases suggest that the most valuable techniques appear to be open days and careers fairs, since these allow young people to see what professional life has to offer. It is recommended to monitor the success of these above mentioned measures. In addition, best practice examples should be promoted by the European institutes, maritime sector working groups and the social partners.

Similarly, it is important to promote sustainability of employment in the shipping sector, and to provide information on career development in the sector. As an example of good practice, in order to ensure career development and increase sustainability of employment for Danish seafarers, a guarantee of 12 month employment (18 months in real terms, including holidays) was introduced for students who complete their junior officer training. This provides junior officers a job security, improves attractiveness of the sector in the eyes of young people, and it also improves their career prospects and the sustainability of employment in relation to competition from non-European seafarers. In recent years the number of young people in Denmark undertaking maritime education and training has increased, anecdotally implying the success of this measure.

A third recommendation, closely linked to the second, relates to training in the sector. As mentioned above, the forecast for the sector is a positive one with the level of seaborne trade on the increase. Even a modest future increase in the number of new ships in the EU will result in additional demand for seafarers; which can only be met by increased recruitment and training and severe shortages in some ranks and for certain specialist ships must be addressed in training plans. Technological advancements and growing

safety and efficiency concerns also had an impact on training requirements in the sector, which again is essential in ensuring high labour productivity and the high skill levels of European seafarers. Although there are sufficient land-based training facilities, on-board training places could be increased, for example by exploiting the provisions in the state aid guidelines. Indeed, the increased availability of the supplementary training would increase the employability of the European seafarers. Increased collaboration between the shipowners associations, social partners and public bodies provides better opportunities to match the emerging skills needs with appropriate training supply. Italy has experiences a problem in recruiting young people – due to a lack of publicly funded training for STCW training for seafarers. Co-operation once again is recommended to ensure affordable training supply as training in this sector is not only important from the point of view of employment, but also in terms of marine safety. International regulations, such as revised STCW Convention on training and the ISM Code have had an impact on the training provision in the industry through the establishment of minimum standards for education and training. However it must be highlighted that further qualifications to the STWC further enhance possibilities for a life time career, both at sea and on shore-side of the maritime cluster. The following table demonstrates three successful measures to improve training in the sector.

Successful methods for improving training in the sector
The UK stakeholders have developed a number of training initiatives aimed at the shipping sector, including the Officer Cadet Scholarship. The Scholarship aims to encourage young men and women to fulfil their ambition for a career at sea and to take advantage of the excellent maritime education available. On a gross basis it costs approximately £35,000 to train a cadet over a three and a half year course. Half of this is covered by SmarT - a government training grant. This covers everything from the cadet's uniform allowance to salary and college fees. In March 2000 the Scholarship gained the annual International Industry's "Salute to Youth Training" award. This was awarded to the best Maritime Youth training organisation from no less than 47 entries from 18 countries[I]. Besides the officer training in the UK, the Merchant Navy Training Board (MNTB) produced the Merchant Navy Foundation Degree (MNFD) framework in October 2005. The degree is a vocational qualification developed to provide a basis for further life-long study, including progression to an Honours level degree and the highest level of professional certificates of competency. The qualification combines college education with sea-going training and experience and incorporates aspects of the 'value-added' qualities that the industry is asking for with regard to management and leadership capability. The programme aims to attract larger numbers of high quality entrants to the Merchant Navy by satisfying the current expectation in school leavers and their parents that further education leads to a degree. Alternative training programmes will continue to be available for those sections of the industry where degree-level programmes are not appropriate. The scheme is partly funded by the monies received as Payments in Lieu of Training (PILOT) from companies choosing not to train cadets in their ships under the tonnage tax regime[II].
Belgium demonstrates an example of good practice in training and education provision and in the way in

[I] www.maritimelondon.co.uk

[II] Further information on http://www.mntb.org.uk/news/Documents/FD_SectFrame_MN.pdf

Successful methods for improving training in the sector
which it has managed to turn the trend of decline in employment around and to increase the number of seafarers of Belgian origin. Indeed, as a result of an intensive campaign to enhance the image of maritime studies and professions in the shipping sector, the number of students in Belgium shows an upward trend. For example, in comparison with the academic year 2003-2004, the number of students in the deck division increased by 8.6% in 2004-2005. However, the number of students in the mechanical division dropped slightly with 5%. As a result the Royal Belgian Ship Owners Association, together with the Higher Navigation School, wishes to develop a high-profile campaign to solve this problem and promote take-up of studies in the mechanical field.
Dual-purpose training officer training that was introduced in 1996 has been widely regarded as success in Denmark. This qualifies a ship's officer to work both as a navigator and as a 'machine master'. The aim of the training was, and still is, to give Danish officers a competitive advantage over foreign ship's officers in being able to master two occupations.
To counteract problems relating to the lack of publicly financed training in the shipping sector, a new Italian shipping academy - Accademia del mare (Sea academy) - was established in Genova in 2005. At the academy the cadets can study for 2 years, combining a year of service at sea and a mandatory STCW training course.

Last but not least Member States should fully explore and use the potential of the State Aid Guidelines, and not only in fiscal terms but also from the perspective social security and income taxation. ECSA also calls for a stable global regulative framework as frequent changes in regulations make it difficult to plan and optimise maritime transport; according to ECSA global rules for the shipping industry would ensure that European shipping can operate outside Europe on a level playing field. This is particularly important as a considerable share of the EU's shipping industry turnover comes from activities outside Europe. The global character of the industry has also been increasingly recognised by international bodies like the EU institutions and the OECD. As a result, most of the recent EU regulations on safety, environment and social matters are based on IMO and ILO Conventions.

The rest of the section focuses on a more detailed analysis of tonnage tax regimes with a discussion on their impact on sustaining employment. It also briefly reviews discussions on the introduction of a tonnage tax in Sweden. The chapter will conclude by discussing the concept of 'policy package' approach in sustaining employment in the shipping sector.

Tonnage tax - overview

Tonnage tax has been operating in Europe in different forms since the mid-1990s. Greece was the first country to introduce a tonnage tax in the mid 1990s, followed by the Netherlands and Norway, Germany in 1999, the UK in 2000, and Denmark, Spain, Ireland, Belgium, Italy, Finland and France in 2002.

Nearly universally across Europe the introduction of tonnage tax has led to an increase in the number of vessels registered under European flags and a decline in the average age of the Community flagged fleet. However, the extent to which it has managed to address the decline in the number of EU seafarers varies significantly from Member State to Member State. As a part of the national stakeholder consultation process for this study it was found that the tonnage tax schemes from Belgium, the Netherlands, Denmark and the UK were regarded as particularly successful from the point of view of employment creation. However, it must be noted that usually it is tonnage tax regime together with other measures that have made the most significant contribution for employment.

Experience from the UK

To rectify the problem around the decline of the UK-owned fleet, the British Government set up a Shipping Working Group in 1997 which, in 1998, recommended the introduction of a tonnage tax. A White paper *'British Shipping: Charting a New course'* was published in1998, which outlined the future of Transport in the UK and in 1999 the Chancellor of the Exchequer commissioned an independent enquiry into the case for a tonnage tax regime for shipping. The Finance Act 2000 contained the main points of the legislation, which were supplemented by the Tonnage Tax Regulations 2000, a Statement of Practice and Tonnage Tax (Training Requirements) Regulations 2000, and the most recent Finance Act 2005.

The main objectives of the tonnage tax were to reverse the decline in the UK shipping industry by increasing direct ownership of shipping by companies within the UK, and by increasing the UK's merchant marine workforce (Leggate and McConville, 2005). Addressing employment of seafarers in maritime industries ashore was also a key objective.

The UK Tonnage Tax largely follows the Dutch model, but also has some distinct elements. To qualify for inclusion in the regime, a ship must be seagoing and over 100 gross tons used for: the carriage by sea of passengers, or cargo; towage, salvage or other marine assistance carried out at sea; or transport by sea in connection with other services of a kind necessarily provided at sea (Moore Stephens). There is a 75% limit on chartered tonnage, i.e. not more than 75% of the net tonnage of the qualifying ships operated can be chartered in other than on 'bareboat charter terms', this does not apply to chartered members of the same UK group. The election is in force for 10 years unless the company or group ceases to qualify, the 75% limit on chartered tonnage is exceeded, or if a company is found guilty of tax avoidance.

An important feature of the UK tonnage tax is its associated minimum training requirement, which has been hailed as an important and unique feature of the UK tax. The training element requires that companies must recruit and train one UK cadet per year for every 15 officer posts entered on the Safe Manning Certificates/Safe Manning Documents for all vessels in the regime. Companies must also continue to train recruits from previous two years, so that once a company has been in tonnage tax for three years it will be training three UK cadets for every fifteen officer posts. The trainees must be UK or EEA nationals and resident in the UK. However, a company can also choose make a payment in lieu of training (PILOT), instead of training. In terms of ratings (crew members) companies must also review annually the feasibility

of adopting each of the ratings' employment and development options agreed by the tripartite Ratings Task Force. The training obligations applying to ratings need to be flexible.

The UK Tonnage Tax has had a number of positive results, mainly in terms of increases in the UK tonnage, numbers of vessels in the UK registry, earnings generated by the sector and sustained and even slightly increased employment. Anecdotal evidence also exists that the tax has had a positive impact on shore-based employment elsewhere in the maritime cluster. Although the employment and training impacts of the tax can be contested in a sense that the tax has failed to deliver increases in the UK officer employment, the impact of the tax overall is recognised as positive by the British shipping industry stakeholders.

When looking more closely at the impact and firstly, at the evolution of tonnage and the number of vessels registered and flagged in the UK (see the following table), the introduction of the tax has substantially increased the fleet registered in the UK. In the first year of the tax, the UK registry increased in tonnage terms by 20% and represented some 33% of the UK-owned fleet (Selkou and Roe, 2002). According the Department for Transport (DfT) the number of ships in the UK register is now over 1,400 and 76 company groups are now active in the scheme with 830 ships. However, the current tonnage tax has no guarantees that vessels will register under the UK flag, nor that they will remain, as the legislation allows tonnage tax election not based on registration but on vessels strategically and commercially managed in the UK. It is estimated that 57% of ships electing for tonnage tax are flagged in UK or another EU state (Leggate and McConville, 2005). Information provided by the Department for Transport differs slightly; it is stated that about half of the ships registered under the tax are UK flagged. The DfT indeed urges caution with regards to external studies about the tax as companies may choose not to report their registration under the tonnage tax, and therefore external research about employment may be incomplete.

Among the impact of the tax (a trend perhaps accelerated by the legislation) is also that foreign shipping companies have established strategic and commercial control of on-shore operation, which are often run by UK-based ship managers. However, legislation introduced in the UK from 1 April 2006 onwards means that when a ship operator in the regime adds a ship to its fleet it must be flagged as vessel of a member state.

Table 16.1 Vessels in UK Tonnage Tax

	No of Companies	No of Vessels	of which UK flag
2000-01	15	187	
2001-02	42	520	297
2002-03	62	724	340
2003-04	65	745	397
2004-05	71	764	426
2005-06	74	825	425

Source: Department for Transport 2005

The tax has also had a very positive impact on earnings of the shipping sector. The sector has, for the first time in 12 years, overtaken air transport as the third largest service sector for export earnings, now £7.1bn. According to the Department for Transport the shipping sector has also in 2005 generated £10.1bn turnover compared with £4.72 in 2002, with the British owned and managed fleet also more than doubling

in size.

Turning to assess the level of impact on employment, the tonnage tax appears to have had a positive impact on sustaining overall employment, especially if compared to the decline in overall seafarer employment in other European countries. Indeed over the last 4-5 years the employment of seafarers has gone up by 3%, thus reversing the decline in active UK seafarers (see table below).

Table 16.2 All UK seafarers active at sea

	2002	2003	2004	2005
Certified officers	12,440	13,100	13,150	13,240
Uncertified officers	2,750	3,750	3,260	2,910
Ratings	9,510	10,490	10,270	9,320
Officer Trainees	1,010	1,000	1,030	1,050
Total active at sea	**25,710**	**28,340**	**27,710**	**26,520**

Source: Department for Transport: UK Seafarers Analysis 2006

According to NUMAST growth has also been witnessed in shore-based employment due to the requirement for companies registered in the regime to have UK-based operations. This has led to the creation of jobs mainly in management, personnel, training and administration. However, no figures are available for the actual employment created, and the evidence is largely anecdotal.

Regardless of these developments, the tonnage tax has not fully created the impact on employment that was hoped for. There were 896 UK officers employed on tonnage tax boats when the tonnage tax started in 2000–01, and now there are 2,888. The number of ratings has increased from 449 to 1,460. However, it could be argued that these increases are due to the increases in the number of boats under the tonnage tax over that period (House of Commons Debate 2006). Some contest the regime's achievements in terms of employment of British seafarers: trade unions argue that the law has led to a sustained proportionate increase in employment of non-UK seafarers but to a proportionate decline in the number of UK seafarers (see the table below). Furthermore, it remains to be seen how sustainable this employment is, as transferring from one tonnage system to another is fairly easy, and many countries, such as India are now introducing their own tonnage tax systems. Nonetheless, the shipping sector stakeholders interviewed for this study argued that overall the tax has had a positive impact on employment. Furthermore, the industry representatives also pointed to a problem with the supply of potential seafarers, as the profession is not seen as an attractive career choice by young people. Therefore to a certain extent proportional increases in employment of non-UK seafarers were expected.

Table 16.3 Officers and ratings by nationality employed on tonnage tax ships

	OFFICERS				RATINGS			
	UK	**Other EEA**	**Other**	**TOTAL**	**UK**	**Other EEA**	**Other**	**TOTAL**
2000-01	896	40	187	**1,123**	449	19	455	**923**
2001-02	3,206	206	1,204	**4,616**	1,685	176	2,909	**4,770**
2002-03	2,931	536	1,606	**5,073**	1,993	655	3,724	**6,372**
2003-04	2,931	538	2,572	**6,041**	1,770	451	4,072	**6,293**

2004-05	2,933	770	2,751	**6,454**	1,667	652	4,504	**6,823**
2005-06	2,888	962	3,232	**7,082**	1,460	636	5,357	**7,453**

Source: Department for Transport 2005

The associated training requirement of the tonnage tax is described as a good practice by the stakeholders such as NUMAST, the trade union for seafarers. However, it is also argued that the tax has not quite delivered the 'unique feature' of increased training[l]. Although the numbers of cadets have somewhat increased, they have not quite reached the levels wished by the trade unions. The number of cadets has improved in terms of percentage growth; but the number still falls short of the sufficient numbers to maintain stability of officer numbers – around 1,000 per annum (Leggate and McConville, 2005). The cumulative training commitment for 2005/06 for shipping companies is 1,371 trainees in their first, second or third year of training. The average number of new starters in training prior to the launch of tonnage tax was under 500, the number of new starters since the launch of tonnage tax has been over 500 and in some years has been over 600, which clearly falls short of the cumulative training commitment (DfT). A survey conducted by McKinnon for NUMAST and British Shipowner's Association found that two thirds of respondents (66%) had officer cadets in training. A majority of the companies had British officer cadets in training, some also having both British and non-British officer cadets. However, out of the 1,298 officer cadets, 763 (59%) were British (Chamber of Shipping and NUMAST, 2006).

The reason for not reaching the training target is that the opt-out for training has been popular, allowing companies to make a payment in lieu of training into a training fund, PILOT fund (Leggate and McConville, 2005). Unions argue that unplanned payments to the PILOT fund are also argued to be high, with unplanned payments increasing from 16% to 23% in 2005. Some of the reasons offered for the increased payments into the PILOT fund are the inability of the shipping industry to cope with the increased numbers of junior officers. The reaction of shipping companies to reduce the level of training may thus be a reaction to the scarcity of junior officer posts at UK rates of pay for cadets at end of their training (House of Commons Transport Committee). There may be other causes of unplanned Payments In Lieu of Training, the main one is argued to be temporary additions to the fleet which temporarily increase a company's training commitment for a limited period (NUMAST).

However, the trade union NUMAST disputes the employers' claim that they cannot take on more cadets than there are jobs. They argued that the main barriers employers face to recruiting UK nationals are costs and the availability of cheaper labour. The tendency to employ foreign junior officers is reflected by findings of a survey carried out for NUMAST and the Chamber for Shipping. A third (32%) of the respondents surveyed expected a significant change in the nature of their company's need for junior officers over the next three years and also expected to recruit junior officers from different countries. Less than half (45%) of the recently qualified cadets that the companies expected to recruit in 2005-2007 were expected to be British.

Some stakeholders have also seen the culture of poaching as a barrier to training and employing junior officers. It is argued that the minority of the companies who do adhere to the tonnage tax training requirement are often undermined by other companies poaching cadets after they have been trained up. This can be a hard hit for companies who on average spend £10,000/year on training cadets for three years (NUMAST).

This case study has demonstrated a number of ways in which the tonnage tax has positively influenced employment in the sector. However, it has also shown some challenges that the sector is facing, particularly in relation to the implementation of the training initiative and recruitment of foreign seafarers. As

a response to these challenges, a link between eligibility for the tonnage tax and the actual employment and training of UK seafaring ratings has been proposed by trade unions in order to improve the impact on UK employment. According to the DfT and Inland Revenue, both the RMT and NUMAST, supported by the TGWU and the TUC, have submitted papers calling for a mandatory employment link in tonnage tax for cadets (NUMAST) and a training and employment link for ratings (RMT). The mandatory employment link would require employers to make a commitment to providing further employment for the cadets they have taken on as trainees. The ship-owners are firmly opposed to this, arguing that it would drive them away from the UK flag.

The proposals are currently being considered by a sub-group of the Shipping Task Force and the decision is due before the summer recess. NUMAST anticipates that it is unlikely that the mandatory employment elements of the proposal will be agreed. However, what may happen instead is that the value of aid to companies for training will be increased. This proposal is also supported by the Chamber of Shipping.

Experience from Sweden

The Swedish shipping industry has campaigned for a system of tonnage tax for Swedish shipping lines for the last 10 years. However, when the proposals for it emerged in Europe in the nineties, the Government had concerns about subsidising a particular sector, largely due to its experience with subsidising the textile sector. But the first development of its kind for the shipping sector was an introduction of shipping aid in 2001 to give the industry similar competitive terms to its closest rivals. The initial bill provided aid only for onboard employee payroll costs on freight vessels, but was later widened to include the ferry sector and extended to cover income tax and all payroll charges for seafarers working on Swedish-registered vessels. Before the introduction of shipping aid, there was a trend towards a significant reduction in the Swedish-controlled tonnage. However, since its implementation this trend has been reversed, and more companies are registering their ships under the Swedish flag. By 2002, 25 vessels had been registered under the Swedish flag. The increase in Swedish-controlled tonnage not only implies an increase in the number of seafarers, but also has an effect on employment in administration, servicing and other land-based services.

Since the introduction of shipping aid, an agreement has also been reached on temporary employment aid (TEA). Under the TEA agreement, a certain proportion of employees on board freight vessels in international traffic may be foreign citizens covered by special collective agreements. Shipowners argue that the agreement has contributed to reducing staffing costs to a competitive level. According to the Swedish Maritime Administration at the end of 2004, a total of 746 TEA employees were working on Swedish vessels.

During the year 2004, a tonnage tax regime was under discussion in several different forums and since then, notably a half a year ago, the mood changed. Those in favour of the tax built up a majority in parliament and widespread support for the tax exists with even the Green Party, who previously opposed the tax. The Minister of Finance decided to appoint a commission of inquiry to investigate and present a proposal for Swedish tonnage-based tax system for shipping on 25 November 2004 and in December that year a chair was appointed to lead the investigation. The Commission presented its report to the Ministry of Finance in February 2006.

The rationale for the tonnage tax is mainly about its contribution to the competitiveness of Sweden's shipping sector's competitiveness. Employment creation is another key objective of the Swedish proposal, both in terms of onboard and onshore jobs. The shipping employers' argument has been based on competitive neutrality vis-à-vis competing countries and the lower numbers of that vessel orders by

Swedish companies for many decades (Swedish Maritime Administration). Other Member States' tonnage tax regimes have also made it more difficult for Sweden to continue without one. Registering under the Swedish flag is also seen to have other positive consequences, namely in terms of better environmental and safety standards.

A committee of twelve representatives from the Ministry of Finance, University of Gothenburg, the Swedish Tax Agency and Business Organisations, such as the Swedish Ship-owners' Association, led the investigation into the tax. The committee was chaired by Goran Ekstrom, Director General for the Swedish Government Employers. During the development of the proposal, the committee also met with representatives from Finance departments of the Danish, Finnish and Norwegian Governments. The proposal has now been submitted to the Ministry of Finance, and is under consultation until late June 2006. The Ministry of Finance will then prepare the Bill for the government. A decision is likely to be taken in the first half of next year. The committee explored tonnage tax systems and their impacts in other member states, and has sought to replicate good elements of regimes from other countries. The Swedish tonnage tax largely follows the model of the UK, Danish or Dutch tax systems. The Finnish, English and Danish cases have been particularly investigated in detail.

The Swedish proposal mirrors many elements of the UK, Dutch and Danish tonnage tax regimes. The main elements of the Swedish proposal are: a company has to have a net tonnage of at least 100; the strategic and economic management of the company must be in Sweden; the net tonnage of rented/leased ships may not exceed 75% of the companies average net tonnage over the tax year; qualified activity is the transport of goods or passengers to sea with companies' own or leased vessel letting of ships without crews; and the period of adherence to the tax must be 10 years. There is no requirement for a Swedish ship to register under the Swedish flag, for tow boats a flag requirement is proposed in accordance with the European Commission guidelines.

In terms of learning from other countries with reference to employment, the UK experience of an increase in onshore jobs elsewhere in the maritime cluster following the introduction of a tonnage tax regime has been mentioned as encouraging for the Swedish context. The tonnage tax is anticipated to have effects on the whole Swedish maritime cluster and on-shore employment.

The Swedish proposal differs from the UK scheme as it lacks a training requirement. This was considered by employers to be unnecessary as there is already considered to be sufficient training provided in the system.

Another key element in the Swedish proposal, that differs from tonnage tax regimes in other Member States is that cabotage is under international competition, and therefore applicable for tonnage tax. Ships engaging in transport between two Swedish ports can register with the tonnage tax regime, which is in contrast to for example, to neighbouring Finland, where cabotage between two Finnish ports may not elect the tax. The justification for this element is that domestic transport competes more and more in the international market (through foreign companies operating on the domestic transport market), and should therefore be considered under international competition.

The consultation of other organisations during the investigation has been comprehensive, and the work of the committee has been described as consensual. According to the Committee Chair, ship-owners and trade unions are fully satisfied with the proposal. The main concerns of the Ministry of Finance is ship-owners may not be paying tax on funds after 10 years, as well as the issue of retro-activeness of the tax from year 2005, i.e. ship-owners being able to register ships bought in the year 2005 into the tax regime.

Growth both in onboard and onshore employment is an anticipated impact of the tax. The impact on land based employment is also underlined: calculations outline that for every employee onboard, employment is created for between 5-6 employees on land (Swedish Tonnage Tax Proposal). One of the impacts of the tax in Sweden may also be increasing numbers of Finnish ship-owners registering in Sweden. The experience of the Finnish tonnage tax system has not been positive, with only one company registering. The Committee has already received phone-calls from Finnish ship-owners registering their interest in the Swedish scheme. This has caused concern among the Finnish seafarers union about the future of employment in the Finnish shipping industry.

Many Member States have taken a 'policy package' approach to the challenges experienced by the sector in relation to employment in order to ensure sustainable policy framework that would address the issue of employment in the longer term future. For example, earlier on this decade the Belgian government was blamed for not following an integrated vision, and only implementing temporary measures. As a response to this criticism the Belgium government started to develop the following package of measures:

- the introduction of a tonnage tax;
- exemption of tax on surplus value of ship sales;
- exemption from company tax and social tax;
- facilitation of educational possibilities for the growing numbers of students interested in sea navigation;
- trying to establish synergies with other countries (particularly the Netherlands) in the field of education;
- bringing ship mortgaging down to the cost level of other countries (the Netherlands); and
- modernising maritime law.

A new Belgian sea navigation policy was introduced in 2004 with the impact that the number of Belgian ships registering under the Belgian flag increasing since 2004. A new dynamic in education has meant that the take-up of maritime education has increased by 50% since 2001. Direct employment in the Belgian shipping cluster (including maritime works) has increased since 1998 by 1% (2.8% for Belgians). This increase is not large, but in light of the expected drop which would have happened under the old regime, it is a good result. It is also worth mentioning that the number of Belgian seafarers recruited has grown, mainly thanks to the other measures (such as employment subsidies) working so well with the tonnage tax regime.

The Irish government has also taken a comprehensive approach to sustain and create employment in the shipping sector, including:

- Introduction of tonnage tax
- Establishment of the National Maritime College of Ireland (NMCI)
- The PRSI Refund Scheme
- Training of junior officers according to the STCW95 standards - Irish Seafarer Training Grants Scheme ISEA
  Campaign to promote "Careers at Sea"

16.6 Offshore oil and gas extraction

Europe is home to a third of all manufacturing of equipment related to offshore oil and gas extraction. This together with the fact that existing oil fields will have to improve their yield and in the future new fields will be much smaller than before and at the same time in deeper waters, and often in harsher climates –creates a market for new infrastructure but also poses financial challenges. In addition, all fields will have to meet more stringent environmental and ecological requirements.

Consequently, policies from European and national levels can play a role in supporting research and development in this sector. Organisations representing the industry are already working in this field with support from the European Framework Programmes for research. Eurogif, for example, has set up a Technology Master Plan with the aim of identifying a set of R&D priorities that will enable the European Service & Supply Industry in co-operation with the operators, universities and research institutes to develop the technology needed to find and produce fossil energy with a minimum discharge and emissions, whilst also develop ways to use fossil fuels more intelligently through decarbonisation and CO2 management. The Plan is based on the priorities developed in the thematic networks organised by Eurogif in the 5th Framework Programme (FP5).

It is also essential for the industry to aim at addressing the shortage of young people choosing the oil and gas industry as a career option. The shortage of skilled individuals has currently been reported to be 'acute'.

16.7 Maritime works

There is an urgent demand by the dredging industry to address the growing demand for labour with policy interventions. This is caused by the unattractiveness of the sector among young people, an ageing workforce, expansion of the dredging fleet and a shortage of education and training. This problem has expanded to the stage where individual dredging companies are organising their own training in the Far East and Eastern Europe in order to address the shortage of skilled labour. Some industry representatives have also developed their own programmes in Western Europe with the aim of addressing the poor

image of the sector. For example, in the Netherlands there is a network of education institutions that have committed themselves to promoting dredging technology as a part of their education curriculum. The Association of Dutch Dredging Companies (VBKO) is the sponsor and partner in this network with the main goal of this network to promote the dredging education and the industry as such.

Further data collection and research is also recommended, particularly in relation to employment, education provision in the sector, the age profile of the workforce and expectations of future fleet. Such information should be easily available to companies in the maritime works sector.

The dredging industry stakeholders also support the development of the industry as its own sector within the maritime cluster, due to its growing economic and employment impact. The industry is also calling for simpler European regulations and rule making to enhance transparency and to avoid different interpretations of the regulations by the Member States. This is particular relevant for the dredging industry in terms of the application of the Landfill directive. The dredging industry also calls for the endorsement of international (IMO and ILO) regulations rather than European wide regulations in order to avoid conflicting demands from the European Commission and international organisations. In particular they call for the endorsement of the International Safety Management Code in order to avoid unfair competition from dredging vessels from outside Europe that do not meet these regulations. They would like policy action to also to encourage ratification, implementation and enforcement of the International Labour Convention. Finally, the State Aid guidelines should also be implemented to ensure the competitiveness of the European seafarers in dredging fleet.

16.8 Offshore and coastal wind energy

As the main part of the report recognised, the wind energy market is particularly strong in Europe, with knowledge and related technology more developed than anywhere else in the world. There is still however room to improve technologies, particularly in the *offshore* wind energy market that currently remains as the most expensive and labour extensive segment of the wind energy market.

As a result of increasing globalisation and the ongoing turn towards a knowledge-driven economy it has become more difficult for peripheral European regions to promote regional growth and job creation. This is largely because knowledge based production and services require knowledge developing institutions and a highly skilled workforce - prerequisites peripheral areas often lack. Moreover, some European countries have seen a change in

regional policy favouring larger cities and regions that are already endowed with the requirements necessary to compete in a global and knowledge-driven economy.

The wind energy sector has the potential to induce both new job creation and/or counteract declines in traditional maritime sector employment, particularly in peripheral regions of Europe. This can be demonstrated by a story of a small city in the Danish periphery, Nakskov that in the last few years has reached a turning point in terms of job creation and regional economic growth. As it will be possible to see below this has largely been achieved through a new endogenous development strategy to boost economic and employment growth through investments in green energy industry and innovative development initiatives financed largely by local resources.

Nakskov – from shipbuilding to job creation in offshore and coastal wind energy sector

Nakskov is a town of about 15,000 inhabitants situated on the island Lolland in the southeast peripheral part of Denmark. The city is relatively isolated from commercial and industrial centres - Copenhagen is more than 2 hours away. Hence, Nakskov does not have the same potential in turning into a long-distance suburb like for example Nykoping-Falster, also situated in the same region, but about 50 km closer to Copenhagen.

Over the last couple of decades, Nakskov has had one of the worst images in Denmark, with high unemployment, social problems and population decline. The problems in Nakskov started in the 1970s when the oil crisis of 1973 and 1975 led to a global recession in the shipyard industry, leading to substantial job losses. The situation worsened in the late 1980s when the Copenhagen-based owner of the shipyard in Nakskov decided to close it down in 1986. The shipyard used to be the pillar of the regional economy by being the city's largest employer employing some 2,300 people at its peak. This recession and decline in the shipbuilding industry also had a detrimental effect on a number of other large manufacturing companies in the region, leading to even greater job losses.

As a result of these events unemployment rose to 35% among skilled workers and 40% among unskilled workers in 1988. Unemployment continued to rise and population continued to decline throughout the 1990s.

Several grant and financial support programmes/initiatives financed by the EU, and co-financed by the Danish government and local funds, were initiated to rectify the situation in Nakskov. Unfortunately, as a result of poor adaptation to local conditions and the short term nature of support, these initiatives largely failed to produce sustainable results.

Change of the development path – endogenous development strategy

In 1998, after more than a decade of suffering from high unemployment and population decline, as well as several failed local initiatives, the new mayor of the Socialist People's Party, who had come into office in 1997 ending 84 years of Social Democratic rule, decided that creative measures were needed in order to change course. More specifically, the new mayor decided that the town should 'invest themselves out of problems'. Thus, the city council decided upon a proactive, endogenous development strategy.

The new mayor realised Nakskov's limitations in developing a knowledge driven economy and therefore decided to stick with its traditional industry base with a focus on innovation and niche-markets. The ambition was to build an industrial base where energy, environment, recycling, and heavy industry all should influence the nature of future industrial development of the region. The political decision to focus on 'green industry' was based on the fact that this industry had the second largest growth potential after the IT

industry. Importantly, the new development strategy was unanimously decided by all political parties in the city council, with the exception of the Social Democratic Party.

In connection with the decision to focus future development on Nakskov's traditional industrial base, it was also decided by the city council that the Port of Nakskov should remain as an industrial port. Subsequently, the port and adjacent areas (later to become the Nakskov Industry and Environment Park) were identified as the focal points for development.

Putting the new strategy into action

Key players in moving this strategy from paper to action was a new chief executive and a development manager with a large network of private business leaders in Denmark and abroad. This 'dynamic duo' and the new mayor introduced a new more flexible management style and also set up a development section closely connected to the mayor's office. At the same time, a team of external advisors was connected to the development section to support the start-up process and later advising in technical questions.

In 1999, the 10-year master plan for Nakskov Industry and Environment Park was made, providing a new overall structure for the port of Nakskov and adjacent areas. Already during the preparation of the master plan, Danish windmill producer Vestas, who needed a new site to produce wings for windmills, showed interest. This interest had partly been stimulated by investigative work by a group from the municipality of Nakskov, who actively searched for enterprises in the need of adequate port capacity and which fitted into the concept of 'green industry'. Vestas, however, had some concerns about locating their production to a landfill site and the development group from Nakskov, therefore, decided to spend an extra 5 million DKK (€670,000) on top of the EU support (18 million DKK/€2.4 million) for preparing the production site for Vestas and the rest of the Industry and Environment Park. Specifically, the council offered to remove contaminated soil as well as old concrete. That extra offer and quick decision by the municipality convinced Vestas to establish its factory in Nakskov. The construction of the Vestas factory started in June 1999 and stretched over an area of 20,000m^2.

Whilst the site was prepared for Vestas, the local labour market council and the vocational training school established a temporary training school in Nakskov, in order to ensure that Vestas had access to local workers that were sufficiently trained to work in the plant. About 700 persons received training and when Vestas started production in December 1999 some hundred people were employed.

After the establishment of the Vestas factory, two more new establishments were realised – both related to the production of windmills – Poul Ree, a tower manufacturer, and Skagen Sanblasting, a sandblasting and painting company. This created synergy, 'clustering' effects and made a significant further contribution job creation in the 'green industry' in the region.

As part of the master plan, the municipality also decided to buy the entire former shipyard area in January 2000, in order to build a maritime logistics centre and hence create a better setting for industrial companies. To afford this, the municipality had to take a loan of 100 million DKK. Later Nakskov and the neighbouring three municipalities also bought the farm property next to the harbour area and the area expanded heavily. In total, Nakskov invested some 130 million DKK into the port and adjacent areas. Although the old shipyard area and the adjacent areas are currently owned by the municipality, the aim is sell buildings and sites to private companies. Ideally, only the deposit areas connected to the maritime logistic centre should be owned by the municipality in the future.

Wider outcomes

Since 1999 several companies, including Vestas, Skagen Sandblasting, Trifolium Seeds, RewAir and Remming & Co, have been attracted to Nakskov from other parts of Denmark and from abroad – not only to form ' a green energy industry cluster' but also create employment in other related sectors. Importantly, the development group has been very quick to respond to any interest and actively searched for companies that may benefit from locating in or near the Port of Nakskov, just as they did with Vestas.

Synergy effects strengthened with many local companies intensifying their commercial relations. In addition to Vestas and their subcontractors, synergy effects have also been created through the cooperation of the local power plant that uses waste products from a sugar producing plant, Danisco. Moreover, sections of the recycling site have been used by the Danish Technical University and private engineering companies to experiment for new methods to clean contaminated harbour soil. Thus, new 'green industry' knowledge flows have been inserted into the town.

Currently, representatives from the municipality's technical department are travelling throughout Eastern Europe hoping to sell the new acquired technical expertise through an initiative called Baltic Sea Solutions. Baltic Sea Solutions was launched by Nakskov in cooperation with the inter-municipal network in Lolland-Falster and is a cross-border network throughout the Baltic Sea Region with the goal of boosting sustainable growth and transnational cooperation between public administration systems. Importantly, it deals with globalisation and outsourcing as opportunities to be grasped, rather than as a problem. As part of this project, the Operational Knowledge Centre (OKC) has been created by the Lolland-Falster region to attract new businesses to the Baltic Sea area and encourage the establishment of similar centres throughout the region. Baltic Sea Solutions not only builds institutional capacity in the Baltic States; it is paramount for Nakskov's development opportunities as it strengthens Nakskov's position not only among neighbouring municipalities, but also throughout the Baltic Sea region. It also works internally as a platform for Nakskov's own programmes and brings an added dimension of credibility to the programmes and ideas that are 'exported' further.

The attraction of new companies to Nakskov has been a big boost not only for the city but also the seaport. The new companies that have located to the city (e.g. Vestas and Danisco) now export a significant share of their production via the Port of Nakskov. The increasing activity in and near the port is illustrated by the fact that the tonnage handled by the port increased from 370,000 tonnes to 550,000 tonnes between 2000 and 2003.

Impact on employment

In terms of employment, it is estimated that some 1,400 to 1,500 jobs have been created since 1999. This is significant given the fact that the population of Nakskov is only 15,000. A majority of the jobs have been created at the Vestas factory for wind energy turbines. Employment in the company has gone up from some hundred workers in 1999 to nearly 600 in 2006. Importantly, the Vestas factory uses a significant number of sub-contractors in the local area which has further contributed to the employment growth in the region. It is however difficult to establish whether all of these jobs have been created through the development strategy or if they would have been created anyway. After all Denmark as a whole has experienced an economic growth in recent years.

In relation to transferability of employment from the old shipyard to wind energy industry, some 10% of workers that lost their jobs in the shipbuilding industry have now found employment in the green energy cluster, most of them at Vestas. This is a fairly significant number as the shipyard has been closed for 20 years, thus many former employees have retired and/or left the area.

Access to skilled workers has always been a problem in Nakskov and this problem has further exaggerated in recent years. The lack of skilled labour is largely rooted in the fact that Nakskov lacks higher education institutions, thus a majority of the younger people are forced to leave the region and in many cases they do not end up returning to Nakskov. The extent of the problem is illustrated by a recent study that showed that Nakskov may lack more than 3,500 skilled workers in ten years time. However, in relation to a majority of the new jobs created, they have predominantly been developed at the lower end of the skill scale, manufacturing jobs. But considerable amount of private money has also gone into further training and education of the workers, and the municipality has been working to get tailored training courses to meet the demand of local companies. As an example, the wind turbine manufacturer Vestas has recently set up a 2-year training course to provide a qualification to work in the turbine manufacturing.

Lessons learnt

The key to the positive development in Nakskov in recent years has been the fact that they have succeeded in involving and mobilising all local actors, and fostering collaboration for common good. Moreover, in the face of an increasingly competitive environment, the local decision makers realised the importance of being proactive and making quick decisions (more importantly, having the capacity to make these decisions). Another key to success, as identified by the Director of the Municipality, has been the general belief by the local community that the situation could change.

The development of the green energy cluster has also required chances / investment risk by investing more than 100 million DKK in the area and on the one hand this has put Nakskov under increasing financial pressure. Indeed, local taxes have been raised and is today one of the highest in Denmark, though this is partly due to the social problems that prevail in Nakskov. Moreover, more loans had to be taken in order to repay the loan. Although Nakskov benefited from being in an Objective 2 area and hence received some €2.4 million in assistance, most of the investment has came from local sources. Thus, Nakskov relied on both endogenous and exogenous resources rather than on exogenous resources only, which should improve the transferability of the approach to other regions cities in Denmark and Europe. And the investments have created an interesting environment for businesses to locate in Nakskov. Importantly, the decision to invest this large sum of money has been taken according to a long-term strategy (10 years) that was outlined beforehand and the commune should benefit financially as well as in development/territorial regeneration terms as it sells the revitalised area off to businesses.

All the parties have also agreed that well functioning public/private partnership has been and continues to be at the core of the success. In addition, as mentioned above the coalition of most political parties has played an important role in the positive development of Nakskov and it is believed that a similar development would not have been achieved without this consensus. Thus, if a similar strategy were to be implemented in another peripheral city/region a political consensus would have to be reached.

Finally, this study has been able to present a fairly comprehensive picture of the European wind energy market, it is still the case that there are some significant gaps in data collection and analysis in many countries across the EU. Specifically, there are significant differences in the way individual countries collect employment data and define the industry. The EWEA is concerned about the fact that there are so many different methodologies in collecting data and would like to see a single methodology being used. In the publication 'Wind Energy - The Facts' the EWEA used national input-output tables together with EUROSTAT data.

16.9 Coastal tourism

This is the first European level study to explicitly include the coastal tourism sector in a European wide study of employment in the maritime cluster. This has its justification in the desire to assess the employment creation potential in all sectors related to the sea in order to assist in drawing up a holistic maritime policy. It is also important as it allows the consideration of the transferability of skills and capabilities between sea related sectors. However, the inclusion of this sector is not without its difficulties which include:

- lack of accurate comparable data;
- potential “data distortion” effect of the inclusion of this sector;

- potential for “double counting” of employment, particularly with sectors such as recreational boating;
- differences in skill sets related to the tourism and the “traditional sectors” of the maritime cluster;
- concerns over the quality and seasonality of employment in the coastal tourism sector; and potential policy impact of the inclusion of this sector in the cluster.

The general assessment of employment in the maritime sectors clearly indicates the significance of the share of tourism employment within the overall figures. On the whole, this share and the overall level of employment in coastal tourism have increased over the years (although a trend of continuous growth can by no means be established for all coastal regions, particularly in the context of the apparent increasing desire of European citizens to explore more far away destinations). This generally positive profile therefore appears to provide opportunities for employment and redeployment from sectors currently experiencing decline. While this may be the case it must be noted that the skills sets required and to some extent the quality and sustainability (particularly over whole year) of tourism employment must be taken into consideration. There was some concern among stakeholders that the inclusion of the tourism sector in this study could distort the picture of employment trends in the maritime cluster (which in many sectors are downward) and therefore reduce incentives for policy makers to address European competitiveness issues in more traditional sectors offering more highly skilled, high quality employment.

National and even regional employment data at Member State level currently does not enable us to develop an accurate picture of employment in this sector. Available data for tourism employment up to 50km from the coast are largely little more than estimates with the added difficulty of potential “double counting” with other sectors in the cluster such as recreational boating or cruise tourism. Until more precise methods of data gathering for this specific sector are available, any figures presented must be regarded with a serious degree of caution. The first recommendation must therefore relate to the generation of more reliable data sources to estimate the impact and development of this sector, which in itself includes a wide range of activities from the traditional hotel and catering provision, over cultural and other leisure activities to more specialised providers to the tourism industry.

While some attempts have been made to look at the transferability of skills between different maritime sectors, the reality and potential impact of the transfer of workforce from “traditional” maritime employment to growth sectors such as coastal tourism has not been explored in detail. This should go hand in hand with an assessment of the quality and sustainability of employment in the sector. The case study presented below provides one attempt at reducing the impact of seasonal effects experienced in the coastal tourism

sector. The exchange of policies and good practices between coastal regions is highlighted as an important element in the development of successful integrated strategies for the maritime sector.

The CULTOURMED project is an example of public intervention by the Palma de Mallorca Council to sustain employment and reduce the effects of seasonality on tourism employment on the island. The aim of the project, funded by the INTERREG IIIB MEDOCC programme, was to promote cultural tourism as an alternative to the dominating 'sun and sea holidays' in order to avoid the regions being solely advertised as a summer destination. The regions that signed up to the programme were Palma de Mallorca, Sardinia, Sicily, Campania and Crete.

The project offered an alternative in the medium and long term by promoting sustainable growth of "mature" tourist destinations, improving the competitiveness of the regions within the holiday market as well as the progressive abandonment of the phenomenon of the seasonal economy. Cultural tourism has a positive impact in terms of regeneration of cultural heritage since it leads to the restoration of key sites. Cultural tourism depends less on the climate/season, and can therefore open up opportunities to reduce significant seasonal peak and troughs with their detrimental impact on the sustainability of tourism employment. The project has also sought to improve the co-ordination and quality of the activities offered by the different tourist destinations, involving all the players of the tourism industry on the islands.

Impact

No evaluation of the project has so far been carried out as this is expected to require a longer term analysis, and the project has not been completed yet. However, the project has been expected to increase the tourist expenditure on the island by 15%, create 500 new jobs and better collaboration with regional actors in the tourism industry.

Lessons

The project experienced the normal difficulties of any transnational project regarding different ways of working and the application of different rules and regulations in the participating countries. However the synergy between the cities and the common problematic helped overcome the initial challenges. The project has shown the value of establishing international exchanges between "mature" tourist destinations. It has allowed the exchange of knowledge and expertise but also contributed to a better understanding of their different realities.

17.0 Future growth potential and relevant policy action

The traditional view of employment in the maritime industries is that of a sector in decline. This is partly due to the well documented falls in employment in the European shipbuilding and shipping industries. This study however has found that a number of maritime sectors and their sub-sectors demonstrate a fairly significant growth potential, both in economic and employment terms. Furthermore, whist the shipbuilding industry has witnessed a period of decline, the level of outsourcing has increased and hence increased employment in related sectors, marine equipment in particular.

17.1 Growth sectors

This study has identified five particularly strong growth sectors; offshore and coastal wind energy, cruise tourism, coastal tourism, recreational boating and maritime works. The European Wind Energy Association has estimated that the total employment relating to manufacturing, installation and operation and maintenance of wind turbines is expected to increase from 72,275 in 2002 to 196,900 by 2020. This represents more than a doubling of employment in the wind energy sector compared to 2002. This is partly explained by the projections of increases in offshore capacity (from current 2% of total capacity to 40% by 2020).

The recreational boating sector is expected to grow by 5-6% annually in the short and medium term future. The projected growth can partly be attributed to the fact that the "baby boomer" generation is reaching retirement age, there is increasing wealth among people in their middle age and more importantly there is huge potential in the emerging economies.

In 2004 the total number of passengers in the Western Europe cruise market grew by 5% in comparison to 2003. In the future, cruise ship operations are expected to continue to expand through an increase in cruise ships and investment into the capacity of the Western European market. The demographic trend of an ageing population is expected to further reinforce this trend.

Coastal tourism is still seen as a growth sector even though some regions are expected to reach their optimum level of development in the upcoming years. The WTO has forecast a long-term trend of 3% growth to apply to the European tourism sector until 2020 and the calculations of the WTTC expected increases of up to 17.9% in employment by 2016[II].

The industry representatives of the dredging industry have forecast an overall increase in dredging activity - with a growth rate of 10% to 15% for the upcoming decade. The impact on employment is likely to be a slightly less limited (a growth rate of 5% has been

predicted). An increasing turn-over (worldwide), diversification, a growing number of environmental and coastal protection projects and the need to develop coastal tourism and port infrastructure generate demand for new jobs.

Five further sectors / sub-sectors are estimated to see a moderate growth in employment, at least in the medium term future. The marine equipment sector is expected to increase with an annual rate of 1% until 2009. Environmental systems, cruise ships, gas shipping, LNG carriers and gas treatment technologies are seen as particularly promising sub-sectors.

The maritime R&D sector is one of the two maritime service sectors with a particularly strong growth potential. This is explained by the need for R&D investment as a way of maintaining the competitiveness of the European maritime industries. A particular strong sub-segment of the R&D sector is the R&D activity in the field of new tools for installation and extraction of oil in deep waters; there is potential to increase employment in the manufacturing side if it is sufficiently supported by a high level research and development. Furthermore, employment in the French maritime and transport related insurance industry has demonstrated a clear growth in recent years as is the case of shipbrokerage in the UK (due to the major developments in international shipping that come from soaring freight rates and the boom in shipbuilding orders that create greater demand for ship finance). Short sea shipping is also expected to increase employment in ship brokerage and agency work in smaller ports in peripheral regions.

Table 17.1 Projected employment trends

Moderate growth	Strong growth
• Marine equipment (in particular environmental systems, cruise ships, gas shipping, LNG carriers and gas treatment technologies) +1% →2009 • Port sector employment in peripheral regions • Offshore supply; manufacturing of tools for installation and extraction. • Maritime R&D • Ship brokerage	• Coastal and, in particular, offshore wind energy • Cruise tourism (20%) • Maritime works (dredging and environmental protection in particular) • Coastal tourism • Recreational boating (5-6%)

One of the sub-maritime sectors of which employment is currently marginal (mainly in the field of R&D) but display growth potential is ocean energy. Portugal, UK and Ireland are in particularly strong position to develop tidal and wave energy industries. Ocean energy is a very significant resource in global terms and could potentially be a large market and

employment generating sector in some European countries. The Irish stakeholders have for example identified that ocean energy sectors could have a desirable regional effect in the sense that these energy sources could induce employment development in the more peripheral regions of the country. They have also identified that the technology to build functional wave converters is developing rapidly but the opportunity for Europe to gain a lead remains - as no one proven formula for this sector has been found yet. Ireland is, academically, well represented at the cutting edge of wave and tidal technology due to the technical competence of several universities and their participation in projects with other international participants. Furthermore, because of the direction of prevailing winds and the size of the Atlantic Ocean, North Western Europe, including Ireland, has one of the largest wave energy resources in the world.

Countries with a strong background in the development of technology for coastal and offshore wind energy could also potentially be in a strong position to develop this sector as, for example, the installation skills broadly similar to those needed in the offshore wind energy industry.

17.2 Policy action

The diversity of the factors affecting the many sea related sectors means that policy actions utilise their economic and employment growth potential need to be manifold and interlinked in order to be successful. Policy recommendations regarding specific sectors are included in the sectoral chapters of this report and will not be reiterated here. The main aim of this section is to focus on policy recommendations which are largely valid for several or all the sectors covered by this study. They relate to maritime, transport, energy, R&D, employment and competition policy.

- **Transport policy**

Transport policy has a critical role to play in the future of sea related transport and associated sectors. It is widely recognised by policy makers and stakeholders that the globalisation of manufacturing and trade, as well as increasing congestion on European road networks and the desire to reduce emissions from road transport are all combining to require improvements in the ports infrastructure and its transport interlinkages. Existing bottlenecks in ports and inland shipping routes, as well as the inadequate connection of many ports with other transport links must be addressed in order to exploit the economic potential of the shipping and ports sector and its associated industries.

- **Energy policy**

The development of energy technologies linked to the sea depends to a significant extent, on EU energy policy. EU legislation aimed at liberalising gas and electricity markets, as

well as other relevant legislation including that on the promotion of renewables and the limitation of CO2 emissions has an impact on investments and the utilisation of different forms of electricity generation and gas exploitation. In particular, it is seen to have boosted the development and utilisation – and therefore associated employment in - renewable technology including wind energy. Although wind turbines can be located anywhere, much of the capacity is located in coastal areas and offshore. It is the latter technology which has seen a particular growth in recent years. The future of coastal and off-shore energy production is also strongly links to investment and co-operation in the field of research and development.

- **R&D policy**

The review of the Lisbon strategy emphasised the need to invest more in research and development, as well as encouraging European and international co-operation in this field. This applies to private and as well as public sector investment. Despite the difficulties associated with competitor status among many private companies in Europe on the technology intensive sea related sectors (shipbuilding, maritime equipment, maritime R&D among others) co-operation in the area of research and development has increased in recent years, not least because of the increasing globalisation of ownership structures in this sector. The role of the EU is to boost such public and private sector co-operation and the interlinkages between academic and private sector research through its systems of R&D grants. The 7th EU Framework programme for Research and Technological Development (FP7) declares that special attention will be paid to priority scientific areas which cut across themes, including marine related sciences. However, FP7 is only a small part of investment in R&D in this area and it is therefore important for national efforts to become more co-ordinated to avoid duplication and create synergies. Examples of effective co-operation already exist, for example in WATERBORNE. Experience from such programmes should be exploited to work towards establishing a European marine research network for the regular exchange and co-operation on relevant R&D projects.

In relation to investment in R&D the importance of legislating for – and the observance of European intellectual property rights is highly significant if Europe's competitive position on the global market is to be bolstered and expanded.

- **Regional policy**

Regional policy and the emphasis on territorial cohesion play an important role in the exploitation of the growth potential of sea related sectors. Experience shows that many European coastal areas have traditionally been heavily reliant on one or the other sea related sector (e.g. either mostly tourism or mostly shipbuilding and ports), while possible links between the different sectors have not historically been exploited. This means that a downturn in one sector can have a significant and overwhelming effect on a particular

locality (as demonstrated in the case study of Nakskov in the full report). European structural funds combined with national, regional and local measures have an important role to play in seeking to revive and diversity areas affected by the decline in certain maritime industries.

- **Employment policy**

Across all economic sectors and countries there is an increasing recognition that security in employment is less and less related to job security, but that instead more emphasis needs to be placed on employment security. The approach to "flexicurity" being developed by the European Commission recognises the need to link appropriate employment protection with measures to encourage employability and adaptability through an emphasis on core and transferable skills and lifelong learning[III]. The social partners as well as national policy makers are called upon in devising employment regulation, training, active labour market policy and social protection services which encourage this form of employability and adaptability, as well as ensuring that working conditions are sufficiently attractive and flexible to meet both the needs of employers and employees. Although this is clearly a difficult balancing act which must take into account national and sectoral specificities and requirements, it is clear that in many of the sea related sectors, a better accommodation in this area is yet to be achieved to ensure adequate recruitment and retention while being adaptable to the challenges facing the sectors. A significant amount of good practice is already available in this area which needs to be evaluated and disseminated more systematically.

In order to encourage recruitment and retention in sectors which have suffered from poor image, it is important to promote a career for life approach in the maritime cluster, emphasising skill links between sectors and transferable skills. Training curricula therefore have to be revised. The role of the social partners in this area as crucial as they should inform the content of training on the basis of the latest requirements of the sector. Some efforts have already been made to map skill requirements and career paths – particularly for former seafarers, but this should be expanded to cover all sectors. Links between such activities and the proposals for a European Qualifications Framework should be established to ensure not only sectoral but also geographical mobility.

At the same time, poor image must also be addressed through the provision of adequate living and working conditions, particularly for seafarers. Ratification of the Consolidated Maritime Labour Convention, adopted by the ILO in February 2006 is crucial in this respect. The Commission intends to present a Communication on minimum maritime labour standards addressing the implementation of the ILO consolidated Convention within the framework of community law. The social partners in the sector have an important role to play in this process.

- **Competition policy as well as the application of international rules**

European Union as well as international (e.g. WTO) competition policies are, at least nominally, based on the desire to create a level playing field for intra-EU and international trade. This principle also underlies more recent policy approaches in relation to the availability and application of state aid regimes. While these approaches have led to a phasing out of state aids for sectors such as shipbuilding, these is significant criticism over the perceived lack of application of such rules by a number of global competitors, which is seen to act to the disadvantage of European companies. For examples, concerns about state subsidies to Korean shipyards have been brought to the attention of the WTO but so far remain unresolved. Even more complex are the difficulties posed by the application of different rules to different flag carriers and individuals from different nationalities employed in the shipping industry. Efforts by the European Commission to seek to address this issue (at least in relation to a sub-section of the sector) incorporated in the 1998 Manning Directive[IV] failed to find approval in Council and the Directive was eventually withdrawn in 2004. The social partners were equally unable to reach agreement on a measure aimed at setting minimum standards for personnel working on board intra-EU ferries, with employers fearing retaliatory protectionist measures and a further flagging out of the European fleet. At the same time International Labour Standards applying to work on board ship are insufficient and not universally implemented.

The lack of comprehensive regulation and force behind the implementation of international agreements in relation to competition and labour standards is having an undeniable impact on the economic viability of a number of European sea related sectors and affect employment opportunities for European seafarers contributing to the poor image of a number of sectors and associated recruitment difficulties (see also above) and skill shortages in the wider sea related sectors relying on the availability of these skills.

- **Maritime policy**

While it might rightly be considered that a consideration of maritime policy should come first in an assessment of policy actions necessary to boost the growth potential of the sea related sectors, this is deliberately placed last here, as it will be argued that it is a holistic maritime policy which is best placed to assemble all the different policy strands outlined above and to combine them in a policy mix suitable to benefit employment in the relevant sectors.

This is indeed the approach taken by the European Commission in its recent Green Paper on Maritime Policy. The role of the EU in this area should be to set policy holistic integrated policy guidelines which can be monitored on a regulation and can lead to the collection and active exchange of good practice or existing integrated or indeed particularly relevant or transferable sectoral approaches.

18.0 Conclusions

This study has demonstrated that maritime and sea related sectors are crucial to the economic prosperity of the European Union and provide employment for a total of 5 million individuals. Employment in traditional maritime sectors[V] in the EU-25 amounts to 1.9 million. The exploitation of the growth potential of these sectors is therefore critical to the success of the Lisbon strategy. A holistic policy approach, strategically combining maritime, employment, regional R&D, energy, environment and transport policies is required to fully exploit this economic and employment creation potential in a sustainable way. This section outlines some of the key conclusions:

Data availability

This study has shown that the EU countries are currently lacking a systematic and on-going methodology for data collection, and the definitions of different maritime sectors in the EU are not uniform. Indeed, the definitions vary from source to source, from country to country, even from region to region and often the definitions are not available. These lead into differences in the way in which different countries define direct employment and it also results in difficulties in comparing and collating data for a European level analysis.

The situation is made worse by the overall lack of comparable data as the statistics gathered by the national statistical offices are only available for the fisheries sector, with data largely lacking for other maritime sectors. Industry data, from sector representative organisations, is therefore often regarded as the most reliable information. However, this approach relies on voluntary contributions from these organisations. Also some trade organisations are much more systematic in gathering information on the number of jobs than others. Furthermore, some consider this data to be commercially sensitive and do not wish to disclose workforce data. In order to improve our knowledge and monitoring of employment developments in the sectors, the availability of comparable employment data must be improved in discussions between Eurostat and the national statistical offices.

With reference to statistics, this study also found that the range of definitions for indirect employment of different sea related sectors is even greater than for direct employment. Furthermore, indirect employment of an individual maritime sector often encompasses most other sea related sectors. Consequently an assessment of indirect employment in the maritime cluster was not seen to be appropriate due to the potential of 'double counting'.

Promotion of maritime cluster approach

The maritime cluster approach, which is particularly advanced in the Netherlands and promoted further through the Maritime Industries Forum, should be taken further both at European and Member State levels as it has the potential to give more political impetus to important questions concerning the maritime industries, and such approach also has the potential to help in maintaining maritime networks. Networks between different industries in the maritime sector can be a vital asset for the whole cluster by helping to facilitate co-operation for the sake of the wider cluster in Europe. Co-operation can take place, for example, on joint research projects, marketing and procurement activities and training courses or establishments.

The cluster approach can also give the sea related cluster a better defined concept and scale and therefore the promotion of this concept also has the potential of improving employment data collection in this cluster. Such activity also fosters collaboration and networking between companies in the core maritime sectors and helps them to recognise their shared maritime interests.

Endorsement of global regulations

The maritime sectors, maybe more than any others, clearly operate in an international environment facing global competitive forces. It is therefore particularly important to foster an international level playing field in areas such as competition policy and employment conditions. There is a need to ensure that existing legal and policy frameworks are respected and enforced to avoid unfair competition from low wage countries. This involves the development, ratification, implementation and policing of WTO, ILO and other rules for example in relation to state aids and working conditions of seafarers.

Human resources

The availability of skilled human resources is at the very core of economic growth and employment in the maritime cluster – more and more of the maritime activities have become "knowledge dependant". Therefore, access to high quality maritime education and training should be high on national and local agendas. European level co-operation is also advisable, particularly in niche sectors. There is also a need to encourage industry and maritime cluster organisations to develop functioning partnerships with training and education institutes in order to create maritime education system that is reflective and adaptable to new emerging skill needs.

Indeed, as already mentioned, the maritime and sea related sectors can only be sustainable with a constant supply of EU workers training and skilled in the related

occupational profiles, and in particular seafarers. It is widely acknowledged that recruitment and retention in shipping as well as in shipbuilding is detrimentally affected by the image of the sectors as being in decline and suffering from poor working conditions. As well as initiating campaigns to improve the image of these sectors it is therefore crucial to address regulatory issues, working conditions, work organisation, and training.

For example, it must be explored whether the exclusion of the maritime sector from European labour and social legislation is still appropriate. This is a complex area, made more difficult for example by the differential application of rules regarding working conditions to different categories of workers. And the question whether to apply flag state, home or residence conditions to the employment of seafarers needs to be addressed in the context of sustaining a competitive European shipping fleet. The ratification of the 2006 ILO Consolidated Maritime Convention and the planned Commission communication on the employment conditions of seafarers should contribute to the resolution of these issues.

In addition, a new approach should be promoted to training in the maritime sector which on one hand ensures the close involvement of social partners to ensure that curricula are up to date with the requirements of modern workplaces but also to create routes to a "maritime career path" ensuring internal as well as external mobility for workers in the sector: for example it is widely recognised that the expertise and experience of seafarers is vital for many shore based maritime sectors. The social partners have an important role to play in this debate and existing efforts should be built upon and good practice exchanged.

With reference to cyclical industries like shipbuilding, employment pool schemes can function as a solution to the problems caused by fluctuations in employment. There is also a need to give consideration to establishing training frameworks in the maritime sectors, which emphasise transferable skills as well as sector specific skills. This work could begin by conducting a study to cover commonalities in skill requirements and potential overlap/transferability. A good example of this approach is the study on “Mapping career paths in the maritime industries” commissioned by ECSA and ETF sought to make a contribution to providing career maps, with particular reference to seafarers.

Learning from the best

There is a need to “learn from the best” by studying the business practices of European companies successfully competing on the world market (particularly SMEs). This can contribute to the development of sector specific business tools. Our study has shown that companies successful in developing a market beyond their national borders are more likely be sustainable in the long term. The exchange of business know-how, as well as R&D and innovation development and networking can make a significant contribution to the sustainability of EU level employment.

Exploitation of existing financing opportunities

Member States are also encouraged to make best possible use of financing opportunities offered by the European Commission regimes and funding programmes. This refers, for example, to the use of State Aid Guidelines on employment, education and training in the shipping sector and to the opportunities offered by Leonardo da Vinci programme on education and training.

Importance of traditional maritime industries

There is a need to recognise the importance of the coastal tourism sector and its relevance in relation to revenue generation and labour market potential, but at the same time must not loose sight of the challenges and requirements facing the "traditional" maritime sectors as there is a national and European interest in retaining a strong presence in these areas to underpin standards and ensure investment in innovation and environmentally friendly technologies.

Partnership for policy

For the management of change in maritime industries and wider policy planning for the maritime industries the involvement of the social partners and other key stakeholders in decision making is crucial. This serves to exploit the information and experience of each organisation, as well as enabling the creation of maximum buy-in to suggested policy solutions.

Role of EU

Policy actions must be taken at the appropriate level and should involve all key stakeholders in consultation as well as their implementation. The role of the EU could be fourfold:

- to act where desired outcomes cannot be achieved by member states acting independently (i.e. in terms of regulation or policy co-ordination)
- to encourage the involvement of all stakeholders
- to provide strategic funding to support key priorities
- to set strategic guidelines for holistic maritime policy and to monitor their implementation, as well as encouraging the exchange of good practice.

Furthermore, on the whole, awareness should be raised of the importance of sea related sectors in terms of employment and the possibility of a career in the relevant sectors. The EU also has an important role to play in providing and encouraging greater investment in marine R&D in order to ensure Europe remains competitive in high value added and

innovative maritime sectors. The 7th Framework Research Programme provides funding opportunities in this area, but greater efforts must also be made to co-ordinate national research efforts to avoid duplication and encourage synergies. The setting up of a European network of marine research should therefore be considered. Greater investments in R&D must go hand in hand with efforts to protect European intellectual property rights. It is also essential to ensure longer-term commitment on financing of research and development institutions in the maritime cluster in order to ensure constant, high quality developments.

An integrated transport policy is required to realise the potential for expansion in long and short sea shipping. This relates to investments in port capacity as well as interlinkages with the inland waterway, road and rail network. Investment in this area will act as a catalyst for growth in the shipbuilding, marine equipment and other sectors.

The possibility of regional policy and existing European regional funding must be fully utilised to ensure the diversification of coastal areas, making them less dependent on a single maritime sector. The exchange of good practice in local employment creation in these areas should be more actively encouraged.

Finally, energy policy, environmental policy and R&D policy must be interlinked to ensure that the growth potential of renewable energy linked to the sea and coastal areas can be fully exploited.