

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

Summary



European Commission
DG Fisheries and Maritime Affairs

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

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

C3135 / July 2006

ECOTEC Research & Consulting

Dr Tina Weber and Anne-Mari Nevala

► Priestley House
12-26 Albert Street
Birmingham
B4 7UD
United Kingdom

T +44 (0)121 616 3600
F +44 (0)121 616 3699
www.ecotec.com

CONTENTS

PAGE

1.0	INTRODUCTION	1
2.0	POLICY CONTEXT	1
3.0	EUROPEAN OVERVIEW OF CURRENT EMPLOYMENT	2
4.0	EMPLOYMENT TRENDS.....	7
4.1	Shipbuilding	7
4.2	Marine equipment.....	9
4.3	Seaports and related services.....	10
4.4	Recreational boating	12
4.5	Maritime transport - shipping	13
4.6	Offshore oil and gas extraction	15
4.7	Maritime services	16
4.8	Maritime works	17
4.9	Offshore and coastal wind energy	18
4.10	Marine aggregates.....	19
4.11	Navy	19
4.12	Coastal tourism	20
4.13	Fisheries.....	21
5.0	GROWTH POTENTIAL AND SUPPORTING POLICY ACTIONS	22
5.1	Growth potential of the sea related sectors	22
5.2	Policy actions	25
6.0	CONCLUSIONS	29

1.0 Introduction

This study was commissioned to provide a better and more holistic picture about employment and employment trends in maritime sectors at European and Member States levels. The key objectives of this research were:

- To analyse current level of employment in all sea related sectors^I, trends in employment from the past decade and forecasts for the coming ten years at Member State and European (EU-25) levels.
- To 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.
- To provide an assessment of the strengths and weaknesses of the activities related to the sea or that use sea resources.
- To formulate policy recommendation to the areas where public intervention can play a role in facilitating the exploitation of opportunities or in taking action to counter threats which can have a positive effect on sustainable job creation.

The scope of this research has been to assemble and analyse existing data^{II} from previous studies rather than to gather primary data^{III}.

2.0 Policy context

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^{IV}.

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

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

^{II} Rather than collect new employment data.

^{III} Although in some sectors where data was missing altogether, primary data was gathered through interviews with key stakeholders, which cannot, however, always be regarded as fully representative, but give an indication of sector size and broad trends.

^{IV} European Commission, DG Fisheries and Maritime Affairs.

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 therefore needs to be seen in the context of the drafting and discussion on the 2006 Green Paper on Maritime Policy^I.

3.0 European overview of current employment

All sea related sectors generated approximately 5 million jobs in 2004/2005^{II}. 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%)^{III}, 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^{IV}, the current level of employment has also been calculated for the

^I COM (2006) 275 final “Towards a future maritime policy for the European Union: A European vision for the oceans and seas” <http://ec.europa.eu/maritimeaffairs/>

^{II} 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.

^{III} 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.

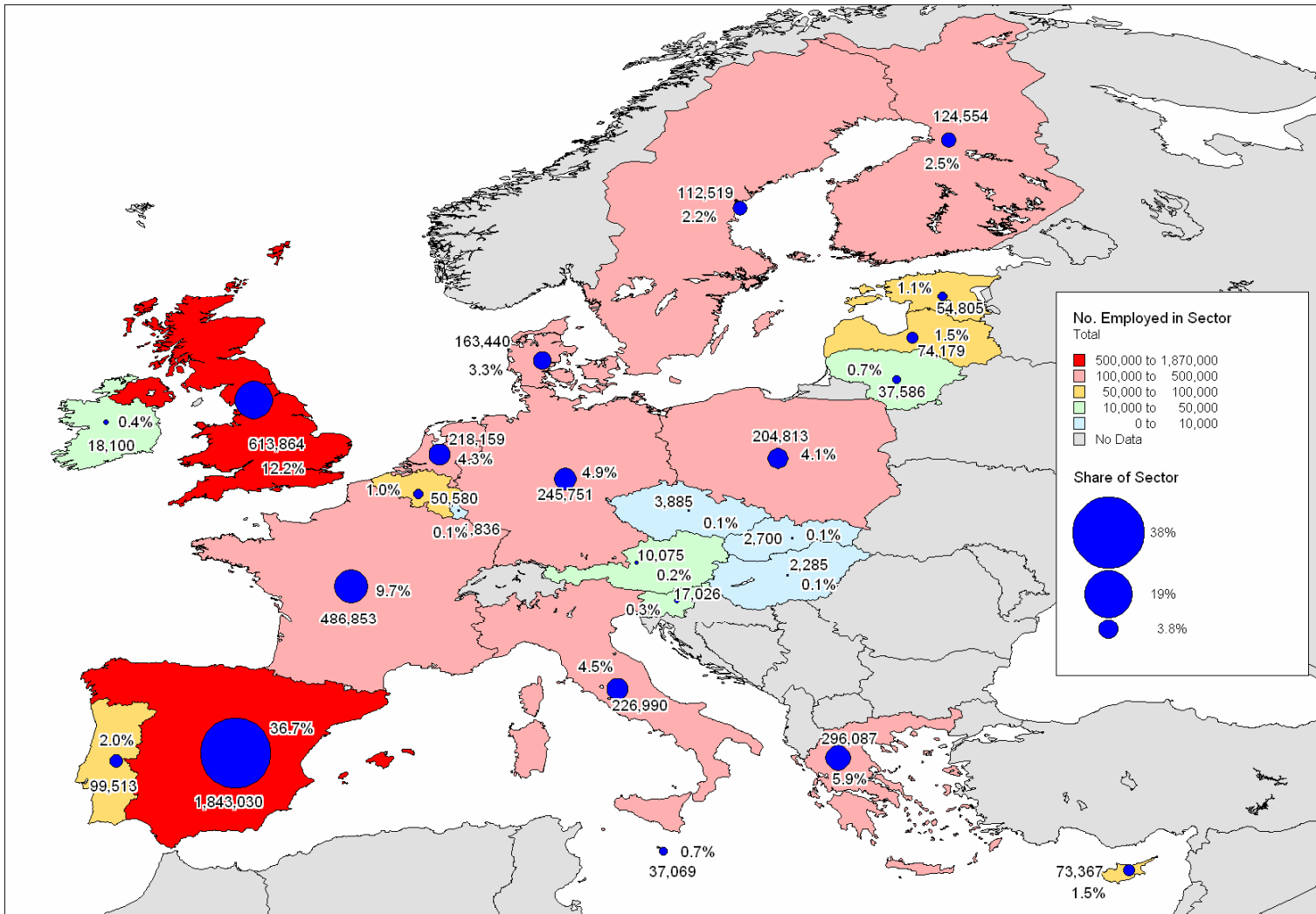
^{IV} Coastal tourism related employment has only been studied in France as a part of their maritime cluster. Thus current figures for coastal tourism, apart from France, must be regarded with a degree of caution - as most are likely to be over-estimates of actual coastal tourism employment (tourism related employment within 50km from the sea).

more traditional maritime industries alone. Employment in these maritime sectors¹ 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 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.

¹ 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 and therefore the total figures are likely to differ from one and another. Sectoral analyses for recreational boating and offshore and coastal wind energy are based on previous sectoral studies – rather than on data from national experts.

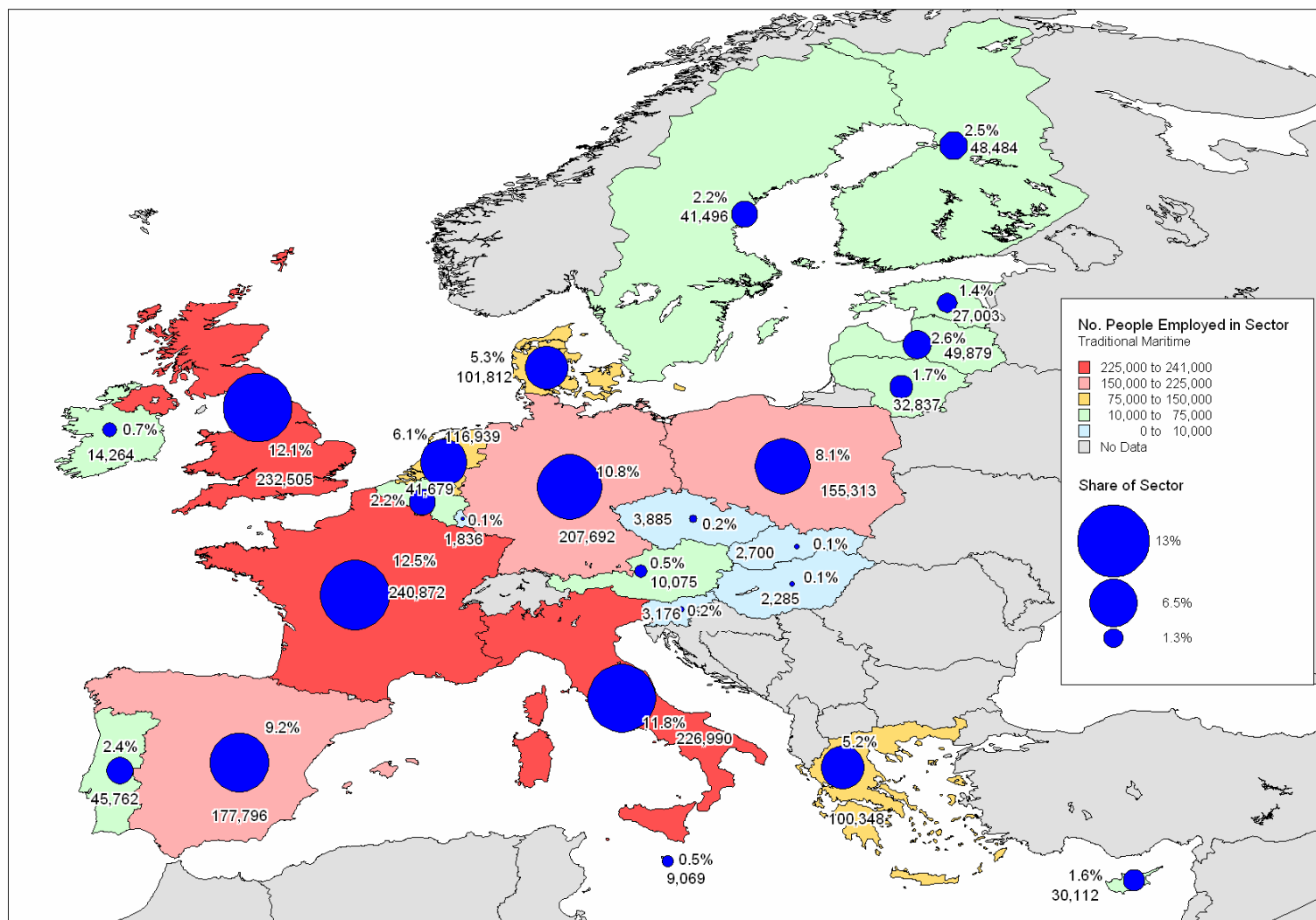
Map 3.1 Employment in all sea related sectors, 2004/2005¹



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

¹ 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 (which has not been possible in the scope of this study).

Map 3.2 Employment in traditional maritime sectors - EU-25, 2004/2005¹



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

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 information on this sector is limitedⁱⁱ and data from many countries present an over-estimate of coastal tourism related employmentⁱⁱⁱ. Further data collection for this sector is

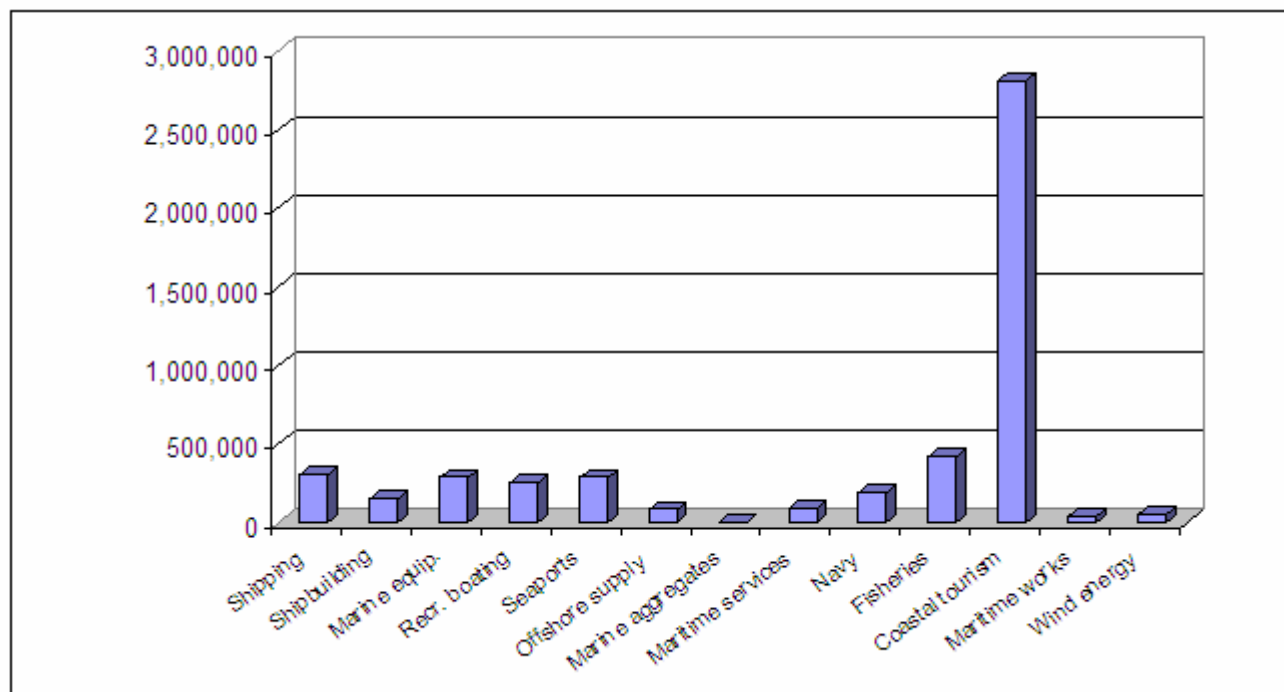
ⁱ These figures include Shipping, Shipbuilding, Marine equipment, Recreational boating, Seaports and related services, Offshore supply, Marine aggregates, Maritime services, Fisheries, Maritime works and Coastal & offshore wind energy.

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

ⁱⁱⁱ 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

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 3.1 Share of different maritime sectors, 2004/2005¹



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

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 303,000 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.

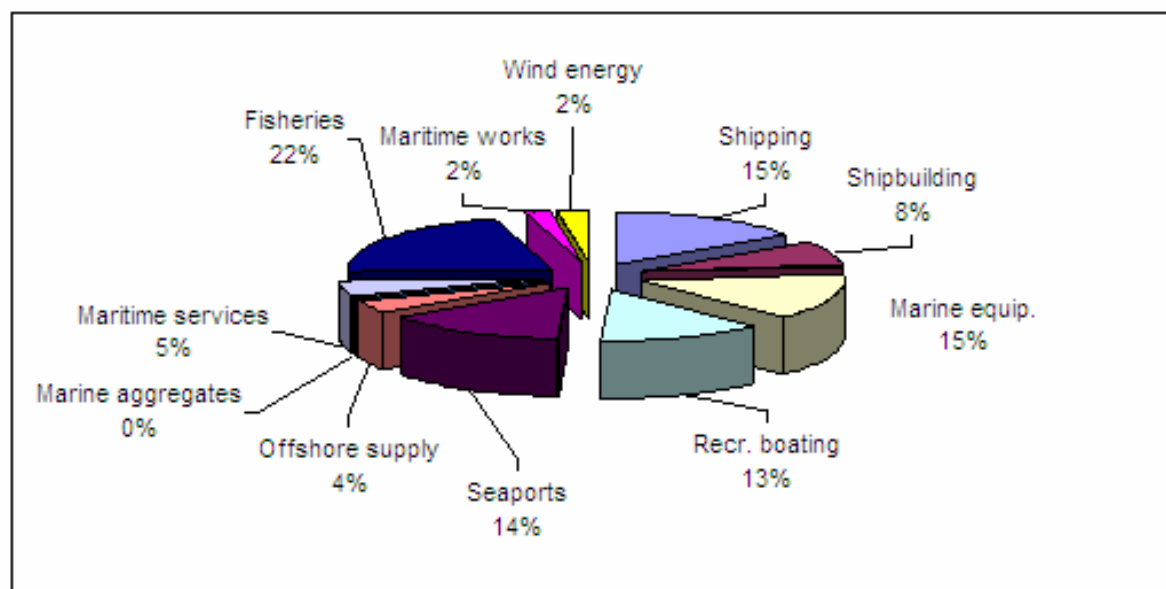
Maritime services sector is one of the most marginal sectors in terms of employment (88,000 employees), although this is also partly due to the lack of systematic data collection. The same applies to offshore and coastal wind energy; however it is a sector with a strong regional economic impact and displays a particularly strong growth potential.

majority of countries in this study present an over-estimation of total coastal tourism (as defined, tourism employment within 50km from the sea).

¹ Statistics for offshore and coastal wind energy mainly refer to the year 2002; Recreation boating 2003 Shipbuilding, 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 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^I.

Figure 3.2 Share (%) of employment, excluding coastal tourism and navy



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

4.0 Employment trends

This section provides a summary of current level of employment in the EU countries, key trends from the past decade and a brief elaboration of key factors affecting employment for each of the study sectors.

4.1 Shipbuilding^{II}

Direct employment in the shipbuilding sector in Europe stood at 153,000 persons in 2004^{III}. During the same year the CESA member yards alone employed 85,000 individuals. The UK, France and Germany are the largest countries in the EU in terms of employment in the shipbuilding sector, with each providing some 23,000-24,000 jobs and with each

^I EuDA, 2006

^{II} The sector constitutes of employment related to building and repair of sea-going vessels and vessels intended for travel on inland waterways and scrapping.

^{III} Includes 2002 figure for the Netherlands and Sweden, 2005 figure for Lithuania, 2003 figure for Belgium, Italy and Portugal.

representing 15-16% of total shipyard workforce in Europe. 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 with 113,000 employees.

Shipbuilding, 2004 ¹									
AT	832	EE	2,701	HU	255	LU	0	SK	950
BE	899	FI	4,823	IE	0	MT	1,765	SI	200
CY	100	FR	23,564	IT	12,727	NL	10,270	ES	5,419
CZ	303	DE	22,982	LV	2,542	PL	19,600	SW	2,635
DK	4,336	GR	3,174	LT	4,902	PT	4,336	UK	24,000

The vast majority of EU countries demonstrate a downward trend in employment. Some of the strongest levels of decline over the past decade have taken place in Denmark (57%), Malta (51.3%) and Spain (45%). The overall trend in Italy and Estonia is upward. In Italy the shipyard workforce increased by 18% between 1995 and 2004. The growth in Estonia has been more modest with an increase of 100 workers between 2000 and 2004.

The largest falls in the industry's workforce occurred between 1995 and 1997 and between 2001-2002 when the sector lost 27,000 employees and 12,000 employees respectively^{II}. Employment decline has been more severe in the ship repair than in the new build segment. According to CESA data the overall decline amounted to 41.7% in ship repair between 1995 and 2003 with the greatest reductions recorded by Poland (74.3%), Portugal (72.8%) and Finland (66.6%). In the new build category the overall CESA workforce decreased in the period from 1995 to 2003 by 25.5%. During this period Portugal increased its workforce by 24.5% and Italy by 8.25% in the new build category.

The sector has suffered great employment losses following the phasing out of subsidies and this situation was further aggravated by the undisputable existence of the illegal subsidies elsewhere in the world. Another important factor affecting employment in the European shipyards over the past decade has been outsourcing, where functions previously carried out by the shipyards directly are now being subcontracted to external suppliers (mainly operating in marine equipment sector) as a means of rationalising

^I Includes 2002 figure for the Netherlands and Sweden, 2005 figure for Lithuania, 2003 figure for Belgium, Italy and Portugal. 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.

^{II} On the basis of CESA data.

operations. The European shipbuilding sector has also been modernised and restructured. This trend has been even more pronounced in the new Member States than in the old EU.

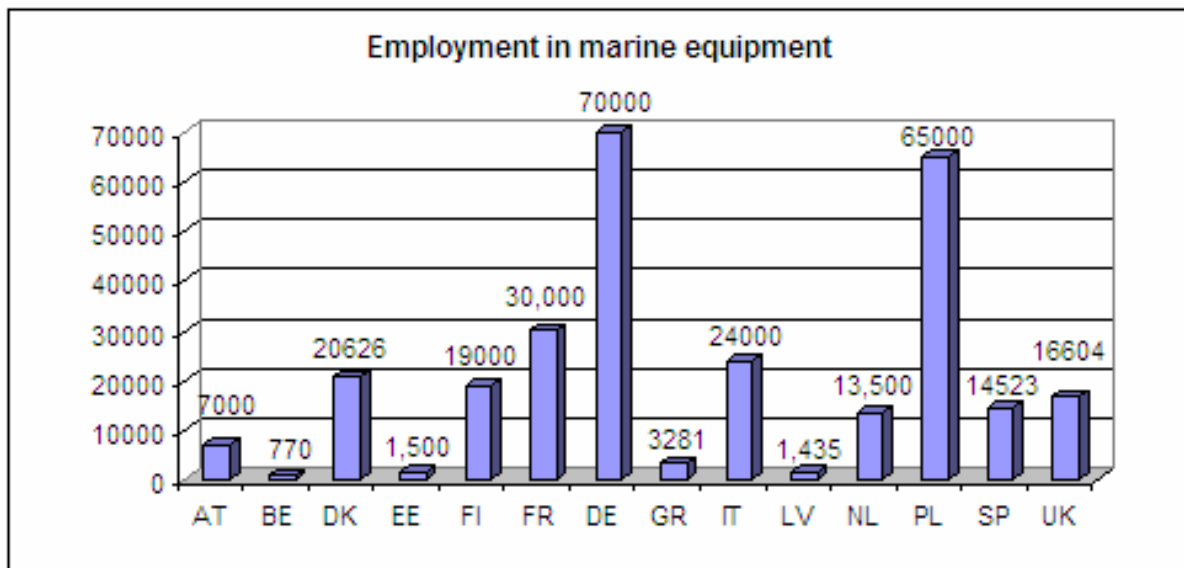
The perception of the sector has suffered as a result of a variety of factors including outdated perceptions of heavy manual work, the image of an industry in decline as a result of past layoffs and strong ongoing cyclical influences. In order to boost recruitment, work not only needs to be done to “update” 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). Another important trend that has exerted enormous influence on the sector’s workforce is ageing. Despite these challenges employment forecast for the shipbuilding industry is a positive one until 2008 as order books are strong and orders often take several years to complete.

4.2 Marine equipment

The marine equipment sector provided approximately 287,000 jobs in 2004/5¹ (estimates vary between 272,000 - 302,000). Employment trends vary from country to country. Overall, employment is likely to have seen a moderate growth due to the increase in exports and outsourcing from shipyards. Some countries however have experienced decline in activity and employment; but the decline has not usually been as severe as fall in employment in the shipbuilding sector.

In terms of share of employment in the EU-25, Germany is the biggest player by being home to every fourth job in Europe in this field (70,000 jobs). 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%). Spain was a key player in the industry up until 2004 but the sector has lost 64% of their workforce since 2002 (41,500 to 14,500 employees).

¹ 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.



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 equipmentⁱ. 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 shipyardsⁱⁱ.

The strongest marine equipment industries in Europe rely on exports rather than on internal demand only from the domestic shipyards. E.g. the German, Dutch and Danish companies operating in the marine equipment sector are increasingly export-oriented.

A moderate 1% growth in employment has been forecast up until 2009. The key factor for sustainable growth for the sector in Europe is innovation and investment in R&D, due to the increasing demand for specialised vessels and specialised solutions for the marine sector as a whole.

4.3 Seaports and related services

Seaports of the EU together with related services employing 284,000 individuals in 2005ⁱⁱⁱ. Overall employment has remained relatively static or even declined in most EU-25 countries. Employment has slightly declined over the past decade in Belgium, Finland,

ⁱ EMEC, Future Marine Policy for Europe, p.2

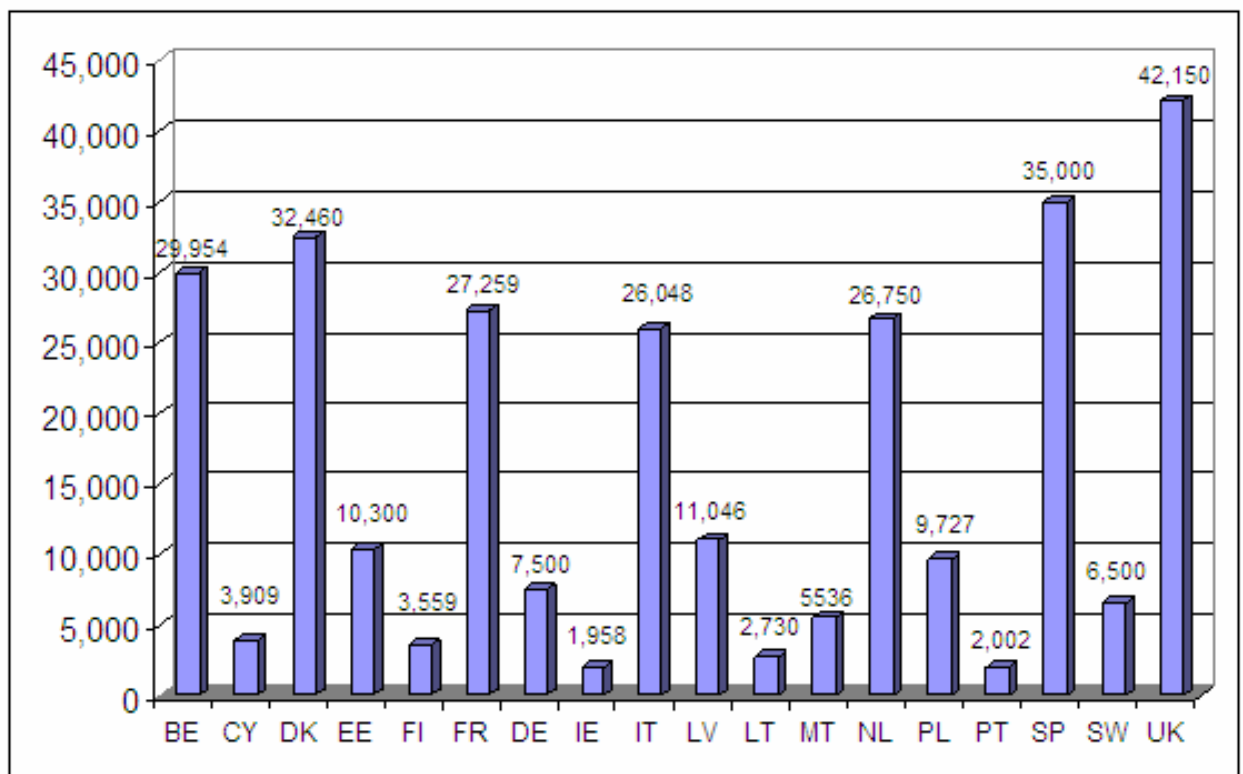
ⁱⁱ These countries include Poland, Spain, Greece, and, to a certain extent Italy.

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. No data was obtained on port sector employment in Greece.

France and Poland, but at the same time has seen considerable increases in countries like Estonia, Cyprus and Portugal.

The United Kingdom, Spain, Denmark¹, Belgium and France all hold 10% or more of total ports related employment in Europe and together constitute 59% of total European employment. In Italy and Netherlands the sector generates around 26,00-27,000 jobs, representing 9% of total employment in the sector each. In relation to the sizes of the countries, seaports are of great economic significance to the economies of Cyprus and Malta.

Figure 4.1 Employment in the EU's seaports and related services, 2004/2005



There has been a substantial fall in employment in maritime pilotage over the last ten years, despite a large increase in maritime traffic. This has partly been caused by:

- Recent reorganisations.
- Increased efficiency (better communication and logistics).
- Introduction of Pilot Exemption Certificates (PEC).
- Exemption from compulsory pilotage for small vessels.

In respect of cargo handling employment, some countries, particularly Cyprus, Estonia and Portugal, have witnessed a significant increase. However, the overall employment trend

¹ The figures for Denmark include the wider maritime service sector.

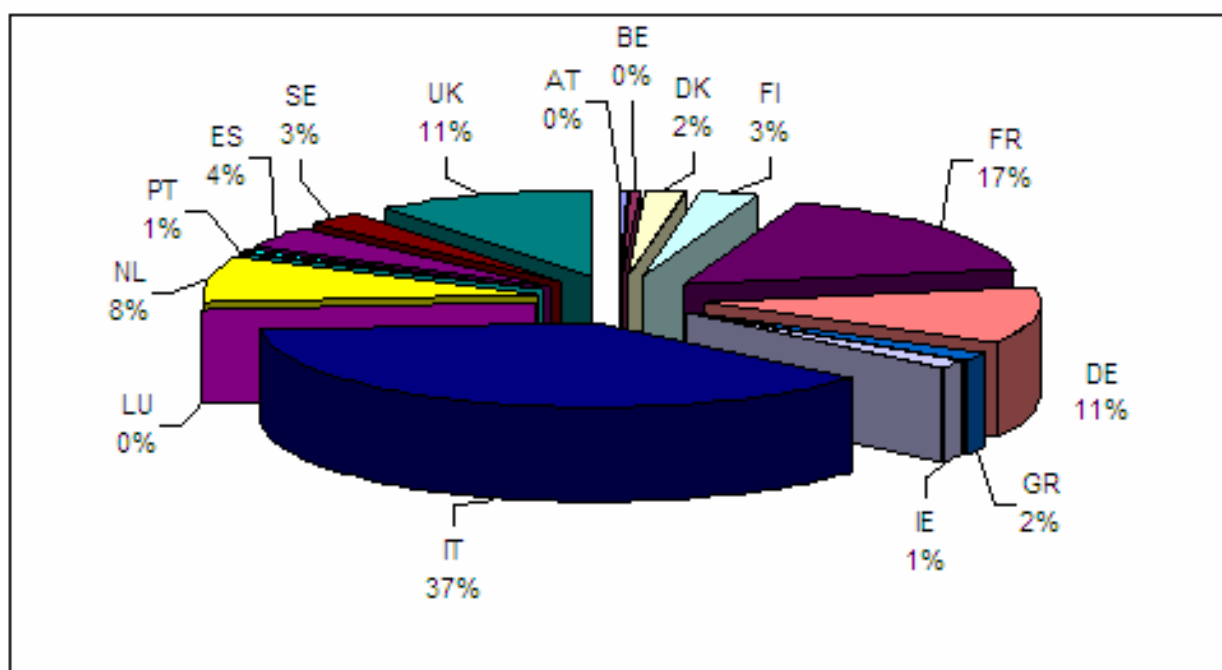
for cargo handling has been relatively static or showed signs of decline. In most countries, with the exception of the Netherlands, employment in port administration has declined slightly over the last ten years. This negative employment trend is likely to be a result of the reorganisation of ports and the redefinition of responsibilities.

Global port activity is set for long term growth, driven by increasing seaborne trade with the world's developing economies and the growth of cruise tourism and shortsea shipping. Despite this positive outlook it is projected that there will only be relatively small changes in sea port employment over the next few years. The reasons for this are:

- Privatisation of ports is likely to lead to operational efficiency savings.
- Investment in new technology (more modern ships and handling technology) by both seaports and shipping companies will reduce labour intensity.
- Growing trend towards greater concentration of activity around a number of logistics centres is likely to lead to significant efficiency gains through economies of scale.

4.4 Recreational boating

Recreational boating (boat building, engine and equipment manufacturing, building and operating of supporting infrastructure and related trade & services) generated just over 253,000 jobs in 2003¹. 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).



¹ European Overview 2004 – Leisure Marine Industry at Your Fingertips (2005) British Marine Federation

Looking at the share of different sub-sectors most jobs in this sector are in related trade and service fields which make up 58% of employment. Boat building takes a 17% share of total employment, followed by equipment manufacturing (15%) and engine manufacturing (10%).

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. Recreational boating is a clear growth sector that is expected to grow by 5-6% annually in the near future, although the sector is expected to face fierce competition from emerging economies and Asian countries in the longer term future.

4.5 Maritime transport - shipping

The maritime transport sector provided a total of 303,000 jobs for EU and non-EU nationals in 2004/2005^I under EU, EEA and third country flags. Poland, Greece and Italy 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.

Poland also has 35,000 jobs in this sector, 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^{II}. Other important maritime nations are the United Kingdom making up 9% of total workforce, followed by Cyprus (8%), the Netherlands (7%) and Latvia (6%). 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.

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

^{II} The Greek shipping companies employ further 11,000 individuals ashore.

Shipping, 2004/2005									
AT	1,056	EE	4,500	HU	250	LU	1,700	SK	505
CY	24,200	FI	11,295	IE	700	MT	137	SI	1,443
CZ	967	FR	13,632	IT	34480	NL	19,850	ES	8000
BE	3,600	DE	10,801	LV	18,842	PL	35,000	SE	14,000
DK	14,815	GR	30,920 (41,961)	LT	11,832	PT	3,206	UK	26,520

General trend in employment has been that of decline. 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 UK situation demonstrates a longer term steady decline, but since 2001 the sector has displayed a slight growth in employment, although at the same time the share of British seafarers out of total seafaring population has declined.

Employment in the shipping sector is affected by many different factors. European regulations and regimes, and the extent to which individual Member States respond to them, have had a strong influence on employment in the shipping sector. Member States have, to different extent, exploited European provisions dealing with ship-owners' fiscal needs and 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).

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. Social partners should attempt to find new solutions in regard to work patterns which can limit lengths of time away from home. This should also be linked to the creation of flexible maritime career paths.

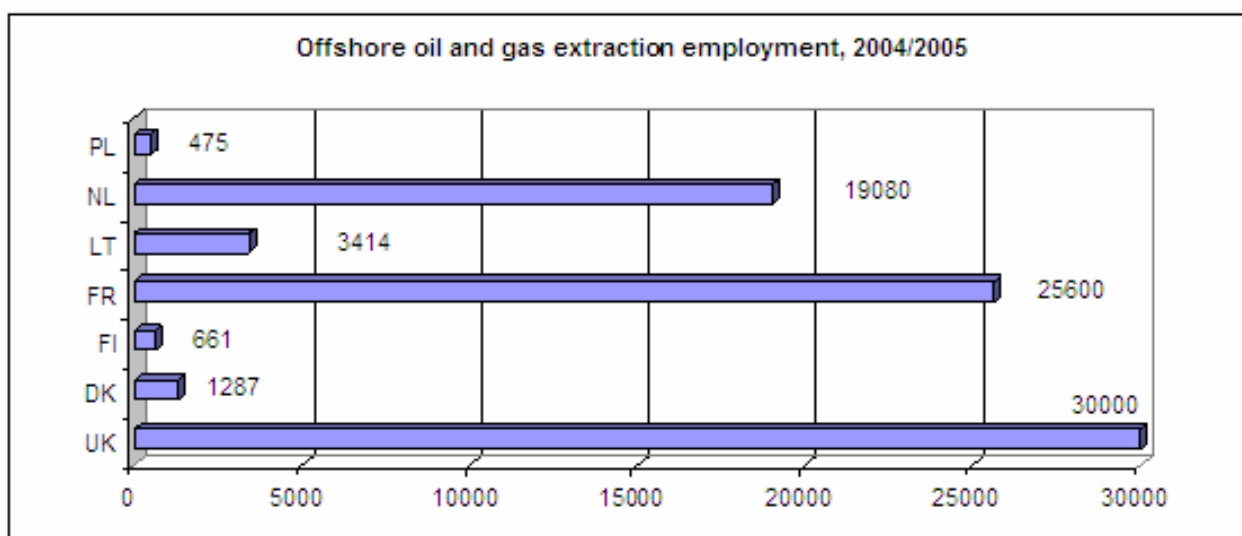
As well as initiating campaigns to improve the image of these sectors it is crucial to address regulatory issues, working conditions, work organisation, and training. For example, it must be explored whether the exclusion of the maritime sector from European labour and social legislation is still appropriate. This is a complex area, made more difficult by the fact that many ship owners fly the flag of a country other than the country of ownership and the differential application of rules regarding working conditions to different categories of workers. 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.

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. On the basis of ECSA 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%ⁱ.

4.6 Offshore oil and gas extraction

It has been estimated that the oil and gas service industries in the EU-25 employed some 200,000 workers directly and around 400,000 indirectly in 2005ⁱⁱ. It is difficult to determine how much of this employment is offshore or indeed coastal, however the findings of this study showed that direct offshore oil and gas sector employment amounted to nearly 81,000 in 2005.



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.

ⁱ On the basis of available statistics.

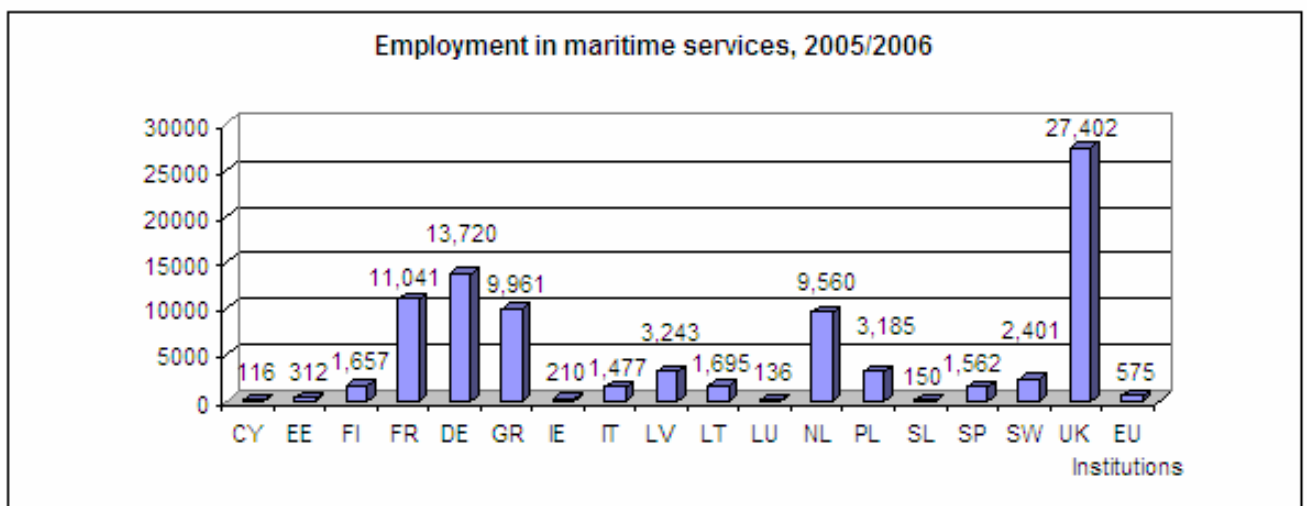
ⁱⁱ EUROGIF, 2006

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 although the 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. Consequently, there is potential to increase employment in the manufacturing side if it is sufficiently supported by high level research and development. On the other hand, an acute and severe shortage of skilled workers presents a major challenge for the sector.

4.7 Maritime services

Employment in maritime services amounted to 88,000 in 2004/2006¹. This is however likely to be an under-estimate of total employment in European maritime service activities as employment for this sector has only been researched in more detail in the UK, France and the Netherlands.

The UK, and London in particular, is the hub of the maritime service sector in Europe not only in terms of the range of services but also in terms of employment. Indeed, the UK hosts nearly a third of all maritime service related jobs in the EU (27,000). Germany comes second 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 Greece and the Netherlands with closer to 10,000 workers each (11%).



¹ Figures for Spain and Cyprus are from 2004; Poland from 2003; Netherlands from 2002 and France from 2001.

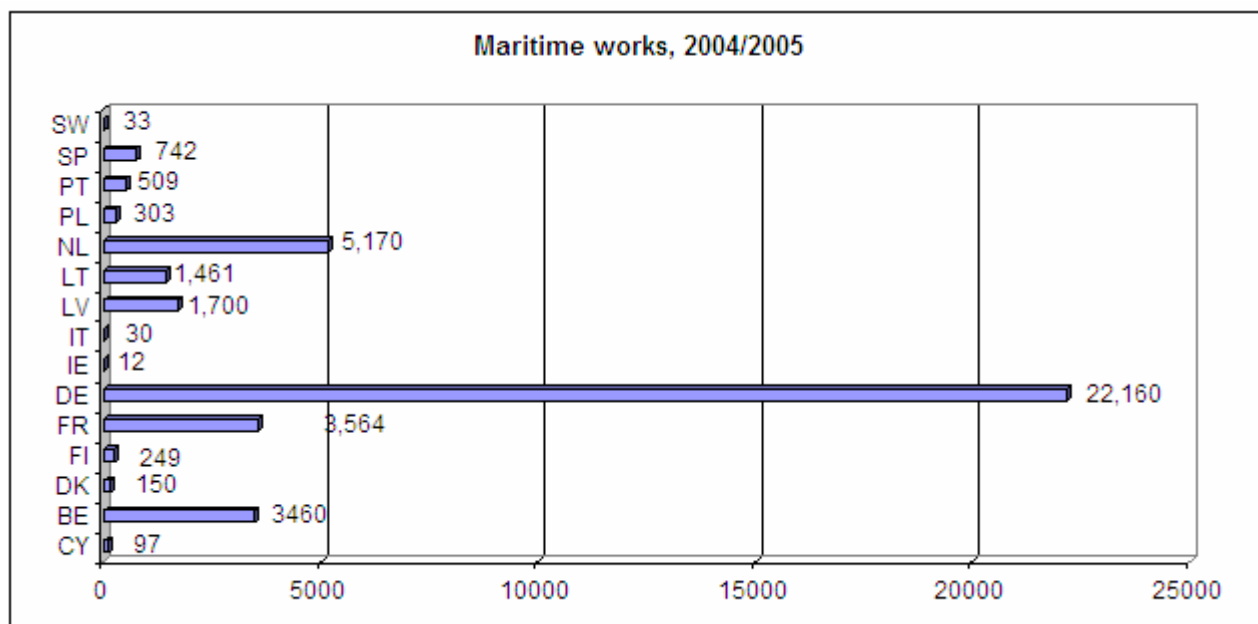
The maritime service sector is seen as a growth sector although in the UK the overall level of employment in the marine commerce segment of the industry marginally declined between 2000 and 2005. But this has been claimed to reflect an improved efficiency and expertise of many organisations, rather than a declining demand for maritime services.

Growth in world trade and the world fleet have expanded the market for maritime commercial services and the tightening of international regulations in shipbuilding has generated heavy demand for additional finance services in the UK for example.

4.8 Maritime works

Maritime works provided employment directly for nearly 40,000 individuals in 2004/2005¹. 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.

Dredging is by far the largest sub-segment of the maritime works sector. According to the European Dredging Association (EuDA) the dredging industry contributed to the creation of a total of 53,289 jobs in 2006 (17,763 directly and 35,526 indirectly). Belgium and the Netherlands are major players in the dredging industry in both European and global terms. 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).



¹ Data for Cyprus is from 2000, France from 2001, for the Netherlands from 2002, for Portugal and Poland from 2003.

Employment in the maritime works sector has increased in Belgium, France and the Netherlands over the past decade. Employment has remained stagnant in Sweden and Latvia, and declined in Finland, Cyprus and Poland, and has been particularly volatile in Portugal. The largest European dredging companies reported a stagnant period between 2002 and 2005 but a period of a strong growth since then. 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.

Some of the most important factors affecting employment positively over the past decade (particularly in favour of larger companies operating in the dredging sector) have been the deregulation of global trade, the opening of the closed markets, the rapid pace of infrastructural developments in the South East Asia and now increasingly also in the Middle East and India. Technological developments have been another key factor affecting the level of seagoing employment in the dredging sector, but negatively; technological advancements of recent years have led to efficiency gains and to a lower number of personnel per dredging vessel.

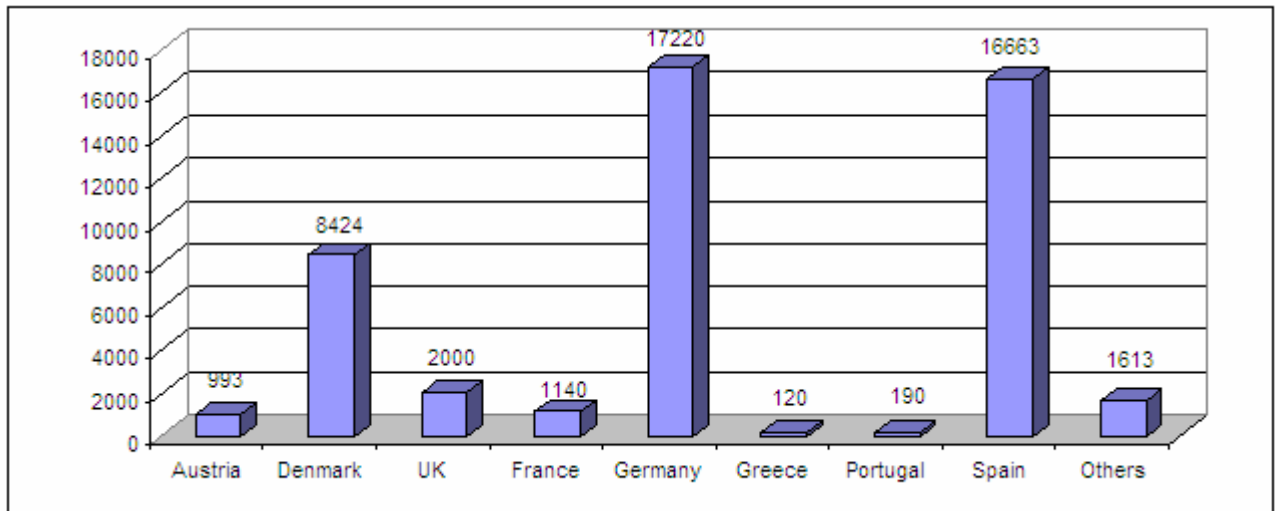
The availability of labour is another factor affecting employment in the dredging sector over the past years and during next 10 years to come; demand for qualified dredging sector personnel is growing, whilst the supply of young educated personnel is too limited in Europe at the moment and the average age of the workforce is rapidly increasing. An annual growth rate of 5% has been predicted for the dredging sector for the upcoming decade.

4.9 Offshore and coastal wind energy

The number of people employed in the European wind energy industry directly and indirectly has increased by some 188% since 1998, from 25,075 to 72,275 employees in 2002¹. The sector generated some 48,000 jobs directly in 2002². The great majority of employment is concentrated in Germany, Spain and Denmark.

¹ These figures do not 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.

² No studies have been carried out to look at the employment impact of offshore and coastal wind energy only but as most of the wind turbines are located by the sea or on the sea, plus the employment generating impact of offshore wind turbines is much greater than the impact of manufacturing, installation and maintenance of turbines located on land, these figures are likely to be a fairly good estimate of total employment in coastal and offshore wind energy sector.



Offshore and coastal wind energy is one of the biggest growth sectors in the maritime sector. For example in Denmark 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.

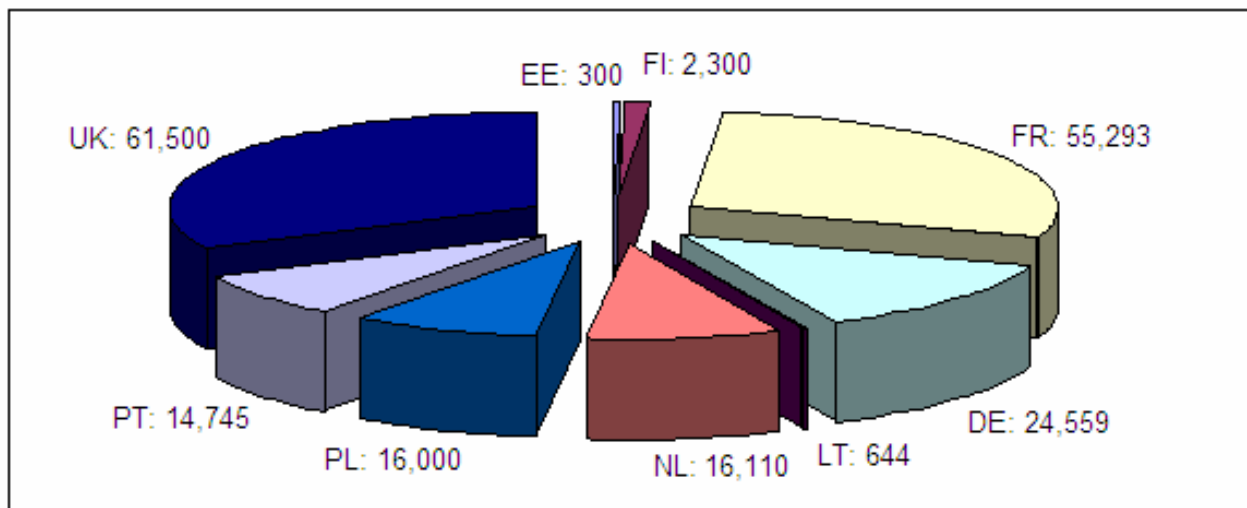
The majority of employment in the European wind energy sector is in the manufacturing of wind turbines – accounting for nearly two-thirds of total employment in 2002. More than 90% of this employment is located in Germany, Spain and Denmark.

4.10 Marine aggregates

The marine aggregates industry contributes to the creation of 2,800 in Europe. Some 2,500 jobs are on British-registered vessels and on land whilst total employment for the sector in France stands at around 300.

4.11 Navy

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



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.

4.12 Coastal tourism^I

Direct tourism employment in the coastal regions of Europe reached 2.8 million in 2004^{II}. If the latest possible figures are used from all the study countries, then the level of employment in this sector would rise to nearly three million with 2.9 employees. 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.

Coastal tourism, 2004									
CY	43,255	FI	73,770	IE	3836	NL	84,370	SP	1,576,377
BE	8,901	FR	190,688	LV	21,336	PL	33,500	SW	71,023
DK	61,628	DE	13,500	LT	4,105	PT	38,894	UK	319,859
EE	27,742	GR	195,739	MT	28,000	SL	13,850		

An analysis of trends in employment over the past decade is fairly straightforward in a 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. In global terms tourism growth slowed down after

^I Coastal tourism related employment has only been studied in France as a part of their maritime cluster. Thus current figures for coastal tourism, apart from France, must be regarded with a degree of caution.

^{II} Employment for Cyprus and Malta is from 2005/2006, 2003 for Ireland, 2002 for Belgium, Finland and Slovenia and 2001 for France. Employment figure for Italy is missing due to the lack of data from national stakeholders.

the 9/11, but this slowdown has not had a major impact on coastal tourism employment in Europe. In fact, employment in many countries showed considerable increases between 2001 and 2002. Employment in the coastal regions of the Baltic States has been particularly strong (with a growth of 123% in Estonia and 73% in Lithuania).

Coastal tourism plays a particularly important economic role in the Mediterranean countries. In Malta, 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 is located in the wider tourism industry (of which 80% is coastal tourism), and hotels and restaurants are the fifth largest group of employers. Coastal tourism is also the largest sector in the French maritime cluster in terms of turnover, added value and employment and the coastal zone of Portugal attracts 90% of foreign tourists visiting Portugal.

The lack of appropriate comparable data is one of the key issues affecting our ability to reliably indicate employment levels in coastal tourism, thus more systematic employment data collection for the sector is strongly recommended^{II}. 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.

4.13 Fisheries^{III}

In 2002/2003, total employment in the fisheries sector amounted to approximately 421,000^{IV} 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.

^I WTTC: Tourism Satellite Accounting, Malta

^{II} The scope of this study only allowed researchers to compare data from existing national studies; only France has a systematic data collection process in place for coastal tourism.

^{III} Fisheries related employment is taken from a study '*Employment in the fisheries sector: current situation*' by LEI BV and Framian BV (2006).

^{IV} This is a sum of full time and part time employment, not full time equivalents.

Employment in the fisheries, EU 2002-2003									
AT	734	EE	6,700	HU	1,680	LU	-	SV	1,180
BE	1,743	FI	2,740	IE	10,584	MT	1,441	SL	623
CY	1,175	FR	64,712	IT	47,957	NL	9,049	SP	87,310
CZ	2,267	DE	16,409	LV	10,580	PL	19,923	SW	3,955
DK	14,060	GR	37,701	LT	6,565	PT	33,229	UK	33,534

Source: LEI BV, Framian BV, 2006, p. 17

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%).

5.0 Growth potential and supporting policy actions

The traditional view of employment in the maritime industries is that of sectors 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. In addition, the economic outlook for a number of sectors which have in the past experienced decline in employment is positive, either at European level, globally or both. Furthermore, it needs to be borne in mind that whilst traditional maritime sectors such as shipbuilding have witnessed a significant period of decline in employment, data are somewhat skewed as the trend towards outsourcing has increased employment in related sectors, marine equipment in particular.

This section seeks to provide an analysis of economic and employment forecasts for the sea related sectors, followed by an overview of policy actions which have been recommended to exploit the growth potential of these sectors fully.

5.1 Growth potential of the sea related 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 the manufacturing, installation, 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 impending retirement of the comparatively wealthy "baby boomer" generation, which is seen to have sufficient disposable income to boost demand in this sector among others. In addition, there is considered to be significant growth potential in the emerging economies.

In 2004 the total number of passengers in the Western European cruise market grew by 5% in comparison to 2003. In 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. Demographic trends towards an ageing population are 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% (Malta) in employment by 2016.

Industry representatives in 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.

Moderate growth	Strong growth
<ul style="list-style-type: none"> • Marine equipment (in particular environmental systems, cruise ships, gas shipping, LNG carriers and gas treatment technologies) +1% →2009 • Shipping sector is likely to grow by 3-4% over the next decade • Port related employment • Maritime R&D, including manufacturing of tools for installation and extraction. • Ship brokerage 	<ul style="list-style-type: none"> • Coastal and, in particular, offshore wind energy • Cruise tourism (20%) • Maritime works (dredging and environmental protection in particular) • Coastal tourism • Recreational boating (5-6%)

Five further sectors / sub-sectors are estimated to see a moderate growth in employment, at least in the medium term:

- 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.
- Global seaborne trade has been predicted to grow steadily with an average annual growth of 3-4% over the next decade. This is a result not only of the overall increase in global trade requiring the transportation of goods, but is also related to increasing congestion on European roads which have led to greater demand for the exploitation of short-sea shipping routes. Port sector employment is also considered likely to increase as a result.
- 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 ship brokerage 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.

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 larger market and employment generating sector in some European countries in the longer term future.

Finally, a study by Douglas Westwood¹ rated the shipbuilding related sectors (civil and naval shipbuilding, repair and conversion as well as its suppliers) as the third largest growth market in the global maritime cluster between 2005 and 2010. However this trend

¹ Douglas Westwood for University of Kiel; World Marine Markets, 2005

is largely not reflected in direct employment figures in the sector in the EU. Global competition is strong in the sector and any positive forecasts also have to be seen against the background of significant overcapacity in world markets.

5.2 Policy actions

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 diversify 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 learning¹. 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 is 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, there 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

¹ The concept is also linked to the need for effective active labour market policy measures; social security measures designed to offer protection while “making work pay” which cannot be explored in more detail here.

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 Directive¹ 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.

¹ The draft Directive only related to employment in intra-EU passenger and goods transport.

6.0 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 sectors¹ 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

¹ 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.

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 lose 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.