



**Comprehensive sectoral  
analysis of emerging  
competences and  
economic activities in the  
European Union:**

***Building and Repairing of  
Ships and Boats sector***

***Final Executive Summary***  
(Version 3)

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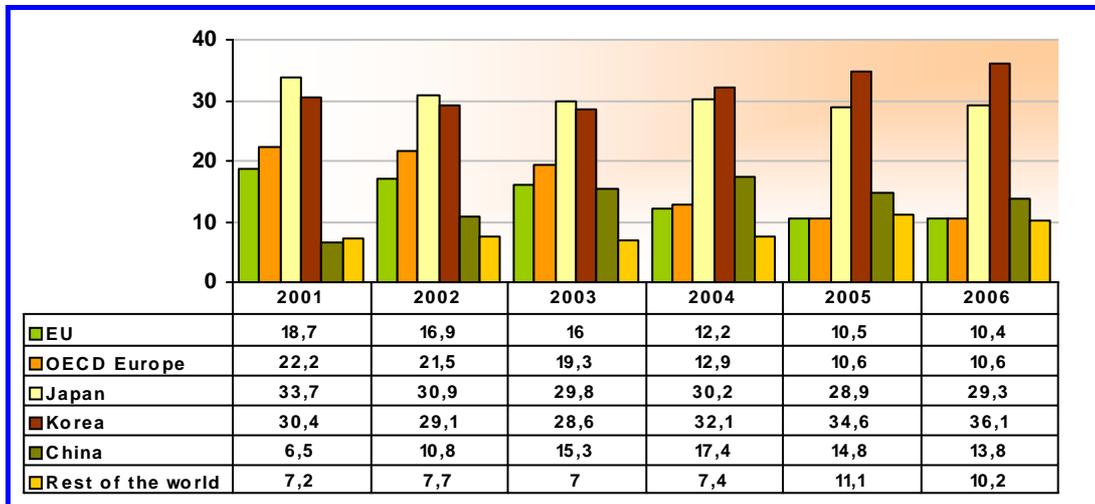
**EXECUTIVE SUMMARY**

**1. MAIN CHARACTERISTICS OF THE SECTOR AND PAST TRENDS IN TERMS OF EMPLOYMENT AND OCCUPATIONS**

***a) Evolution of production***

Approximately a 79.2% of the total world production is delivered by East Asian shipbuilders in China, Japan and South Korea, whereas the EU reached a 10.4% of the total world production. From a time perspective, the share of the East Asian shipbuilders in the total world production has grown up approximately ten percentage points since 2001, whereas the EU production has reduced its participation in more than eight percentage points in the same time period (see Graph 1).

**Graph 1. Distribution by world regions of completed tonnage (% CGT) (2001-2006)**



EU data refers to 12 countries up to 2003 and 14 countries since 2004 onwards.  
Sources: Gerencia del Sector Naval (taken from Lloyd’s Register), 2007 and CESA, 2008

From a country perspective, the most important Member States in terms of their contribution to the European total added value in EU ship and boat building sector in 2006 were Italy and France (17.7% and 17.2% of the total EU-27 sector value added, respectively), followed by Germany and the United Kingdom (14.5% and 14.05, also respectively). Other EU-27 countries relatively important correspond to Spain, The Netherlands, Poland and Finland (with respective participations of 8.5%, 7.3%, 4.7% and 4.1%).

Finally, it is worth stressing that the European industry is particularly specialised in the production and repair of specialised, complex and high tech vessels, both surface and submarine. As a consequence, EU shipyards are increasingly abandoning several low cost market segments such as bulk carriers and tankers (being taken over by the Asian yards, especially Korean and Chinese ones) and focusing on some high-value vessel types (such as cruise and passenger vessels, dredgers, off-shore supply vessels in oil-extracting activities, naval vessels, very specialised non-cargo ships, etc). This market for complex ships is characterised by limited demand in numbers of ships, the building of prototypes with very few sister ships, a tailored and knowledge-based production process, a considerable technical expenditure, and a high number of specialised subcontractors.



### **b) Evolution of employment**

The EU-27 building and repairing of ships and boats sector provided in 2006 employment to 296.0 thousand people. Total EU27 employment in the sector has experienced an upward trend since year 2001, going from 288.1 thousand people in that year to 296.0 thousand people in 2006. However, and from a long time dynamic perspective, the sector employment has experienced a dramatic downward trend, well reflecting the severe crisis that has experienced the European building of ships and boats sector in the last 25 years (specially the shipbuilding activity), as well as active outsourcing and subcontracting strategies.

**Table 1. Evolution of employment in the EU-27 building and repairing of ships and boats sector, 1996-2006 (estimated values)**

	EU15	NMS	EU27
<b>1996</b>	209,565	n.a.	n.a.
<b>1997</b>	206,261	n.a.	n.a.
<b>1998</b>	203,733	n.a.	n.a.
<b>1999</b>	203,062	n.a.	n.a.
<b>2000</b>	196,168	n.a.	n.a.
<b>2001</b>	204,007	84,113	288,120
<b>2002</b>	204,385	85,910	290,295
<b>2003</b>	211,426	81,600	293,026
<b>2004</b>	210,355	84,422	294,777
<b>2005</b>	207,768	87,030	294,798
<b>2006</b>	208,000	88,000	298,000

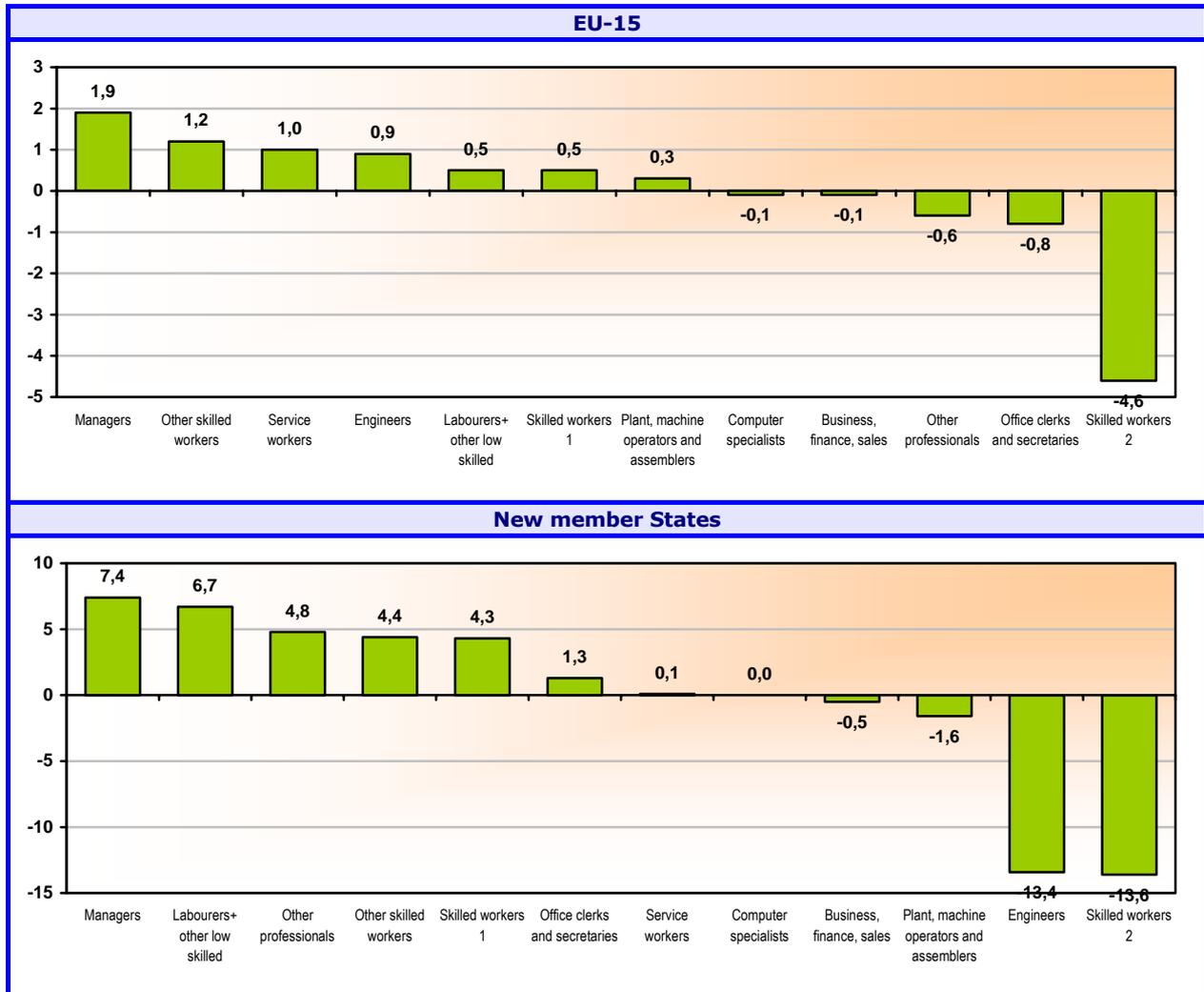
Source: Eurostat, Structural Business Statistics (SBS).  
Own elaboration

### **c) Evolution of occupations**

Skilled workers represent the bulk of the workforce in the European building and repairing of ships and boats sector. Up to 53.12% and 48.9% of the EU-15 and New Member States (NMS) sector employment corresponds to this category, well above the second group in importance, this is, Professional and technicians in the EU-15 (they represent a 20.1% of the sector employment) and Plant, machine operators and assemblers in the NMS, 15.5% of employment). There is also a higher presence of skilled workers in the building and repairing of ships and boats sector in comparison to the total manufacturing sector, as well as a lower presence of semi-skilled (plant, machine operators and assemblers) and low skilled personnel



**Graph 2. Percentage point change in the distribution of occupations EU-15 & NMS, 2001-2007**



Skilled workers 1 includes building frame and related trades workers, building finishers and related trades workers, painters, building structure cleaners and related trades workers

Skill workers 2 includes metal moulders, welders, sheet-metal workers, structural-metal preparers, and related trades workers; Blacksmiths, tool-makers and related trades workers; machinery mechanics and fitters; electrical and electronic equipment mechanics and fitters

Source: Eurostat, European Labour Force Survey

There is a general trend to increase the relative number of managers, engineers and some skilled workers in the EU-15, whereas in the NMS it is precisely the group of engineers that has experienced a very significant reduction in contrast with the increase in the presence of managers and other skilled workers. In general terms, the sector is currently experiencing a shift from blue-collar to white-collar employment and due to the growing demand for better educated personnel, enhanced competences and the development of a multi-skilled workforce as a result of the existing specialisation on high-tech products.



**d) SWOT Matrix of the European Building and Repairing of Ships and Boats sector**

**Table 2. SWOT Matrix of the European Building and Repairing of Ships and Boats sector**

<b>STRENGTHS</b>	<b>WEAKNESSES</b>
<ul style="list-style-type: none"> <li>• Strong historical tradition of the sector as a whole in Europe</li> <li>• Specialisation in high tech vessels and boats</li> <li>• High levels of R&amp;D investment</li> <li>• Presence of a highly consolidated network of suppliers, mostly of them SMEs.</li> <li>• Strong co-operation and integration with suppliers</li> <li>• Strong collaboration between public and private agents</li> <li>• Increasing levels of productivity</li> <li>• Presence of a highly skilled workforce</li> <li>• Fluent Social dialogue, especially as far as human resources and skills issues are concerned</li> <li>• Large network of training and education providers related to the sector</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient collaboration in the RDI domain</li> <li>• Difficulties in financing and guaranteeing schemes</li> <li>• Additional needs for restructuring of shipyards in some Eastern European countries</li> <li>• Lack of a European-wide Naval shipbuilding sector</li> <li>• Relatively high presence of SMEs in some concrete subsectors</li> <li>• Difficulties both in retaining the existing workforce and in recruiting new personnel</li> <li>• Existing gap between existing training supply and companies' skill needs</li> </ul>
<b>OPPORTUNITIES</b>	<b>THREATS</b>
<ul style="list-style-type: none"> <li>• Expected booming demand for maritime transport</li> <li>• Increased use of ocean and short sea shipping for the movement of cargo (sea motorways)</li> <li>• Increased demand for highly specialised vessels</li> <li>• Expected increase in the demand of recreational boats</li> <li>• Positive effects derived from new regulatory framework (safety, environment)</li> <li>• Opportunities derived from the introduction of new innovations in the sector</li> <li>• Increased R&amp;D collaboration with other non-maritime sectors and universities/research centres</li> <li>• Increased cooperation between the sector and other related stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Increased fierce competition from third countries</li> <li>• Unfair competition practices from some Asian countries</li> <li>• Persisting imbalance between supply and demand at world level</li> <li>• Negative economic prospects for the coming years</li> <li>• High volatility of prices related to shipbuilding materials</li> <li>• Negative effects derived from some EU regulations</li> <li>• Relocation of production to third countries</li> <li>• Loss of key sector knowledge</li> <li>• Decreasing and ageing European workforce</li> <li>• Need for a highly qualified, skilled, trained and educated workforce</li> </ul>



## 2. IDENTIFICATION OF DRIVERS OF CHANGE

**Table 3. Main drivers of change**

Economic Demand	Economic Supply	Technology Processes	Technology Products and services	Organisation Conceptual	Organisation executive	Others
<ul style="list-style-type: none"> <li>Influence of the economic cycle (short run, orderbooks full)</li> <li>Increase in world trade, but deteriorating perspectives</li> <li>Increased use of sea transport, both long and short distances</li> </ul>	<ul style="list-style-type: none"> <li>Competence from third countries (China)</li> <li>Large multinational groups</li> <li>Specialised suppliers</li> </ul>	<ul style="list-style-type: none"> <li>Short time design/shipbuilding processes</li> <li>Increased RDI investments</li> <li>ICTs</li> <li>Flexible production processes</li> </ul>	<ul style="list-style-type: none"> <li>Multimodal transport functionalities</li> <li>ICTs and autonomous ships</li> <li>Environmental friendly and energy efficient ships/boats</li> <li>Specialised high-tech, customised vessels and boats</li> </ul>	<ul style="list-style-type: none"> <li>Increased and more complex international/national outsourcing, both materials/equipment and modules</li> <li>Emphasis on basic and development engineering, project management</li> </ul>	<ul style="list-style-type: none"> <li>Growing demand of qualified personnel</li> <li>Shortages of skilled personnel</li> <li>Outsourcing practices, collaborative approaches with suppliers</li> <li>Internationalisation of suppliers</li> </ul>	<ul style="list-style-type: none"> <li>Growth of fuel and other raw materials costs</li> <li>Increasing safety and Environmental concerns</li> <li>Regulation on sea transports</li> <li>Strong public-private cooperation</li> </ul>

Source: Own elaboration

Regarding economic factors, the **evolution of world trade and sea transport** has a crucial importance on shipbuilding demand. There is a general trend towards world trade increase, even though an unfavourable evolution can be detected during last years which is being dramatically aggravated in the last months. Even if it is estimated that the orderbook guarantees activity for next 4 years, the mid-term impact on demand from the current **economic and financial crisis** seems difficult to evaluate. It must be kept in mind also that shipbuilding is a sector with high and complex financial needs and particularly exposed to the current financial constraints.

As regards to the growth of cost of fuel, this might have ambivalent effects. On the negative side, freight costs would increase, discouraging some demand. On the other hand, it would induce the merchant fleet to slow down to "economy speed", meaning that for the same volume of cargo, an increased number of ships would be needed in order to keep constant the overall ratio of cargo/distance/time unit. Additionally, a high price of petrol is making increasingly attractive (in economic terms) the exploration of new deposits, giving way to new demand for prospection ships, sea-platforms, etc.

In brief, depending on the impact of the economic and financial crisis, an increased use of sea transport can be expected, both for long distance, intercontinental commerce and for short sea (sea motorways), as a growing alternative to land transport severely affected by congestion problems.

To a great extent, demand for European specialised high-tech ships should go parallel to general demand for standard cargo ships, and the same can be said with respect to passenger ships (cruises, ferries, etc.), always subject to the evolution of economic cycle in the months to come.

Also on the demand side, the **strong influence of regulatory framework** can be underlined. Increasing **environmental rules** and requirements influence the type of ships needed with a positive impact on demand for the type of ships produced by the European industry. A reinforced EU Public private cooperation (i.e. LeaderShip initiative) and a fluent social dialogue should help to exploit the potential benefits of the regulatory framework.

Looking on the supply side, the panorama is marked by the **competence from third countries (particularly China and Korea)**, with an increasing installed production



capacity (public sector support) and lower production costs, both materials (steel,...) and labour (wages and social costs), often with unfair competition practices. This situation implies a medium term risk of overcapacity at world level, with falling prices, even in spite of growing demand.

In any case, the technological development in these countries (especially Korea) can be regarded as a major threat for the European industry, the term depending on the speed of the process. This question seems crucial, as **technology can be regarded as the main European competitive advantage**. The EU industry is specialised in high-tech ships with a number of traits that make it difficult for the Asian countries to produce:

- Energy efficient, low emissions and environmental friendly ships
- Low risk design and safety equipment
- Communication technologies (autonomous ship)
- Short sea operations and multimodal transport functionalities
- Short time design, flexible shipbuilding processes

This implies a need for increased RDI investments in order to maintain this technological advantage, requesting an improvement in cooperative policies and on intellectual and property rights safeguard (see Waterborne programme).

The organisation of production and sectoral value chain is characterised by the presence of **large multinational shipyard groups** and **increased outsourcing**, both of materials and equipment as of subcontracting of modules. Shipyards tend to keep only core activities, basic and development engineering and project management, which implies the need of collaborative approaches and strategies to integrate and upgrade ancillary industry.

Finally, the **shortage of skilled human resources** must be mentioned. The sector is thriving to improve its image, but nevertheless difficulties remain to attract and retain qualified personnel, in a context of ageing labour force. In addition, there is a strong demand of qualified personnel, all of which entails a need for specific recruiting and training strategies.

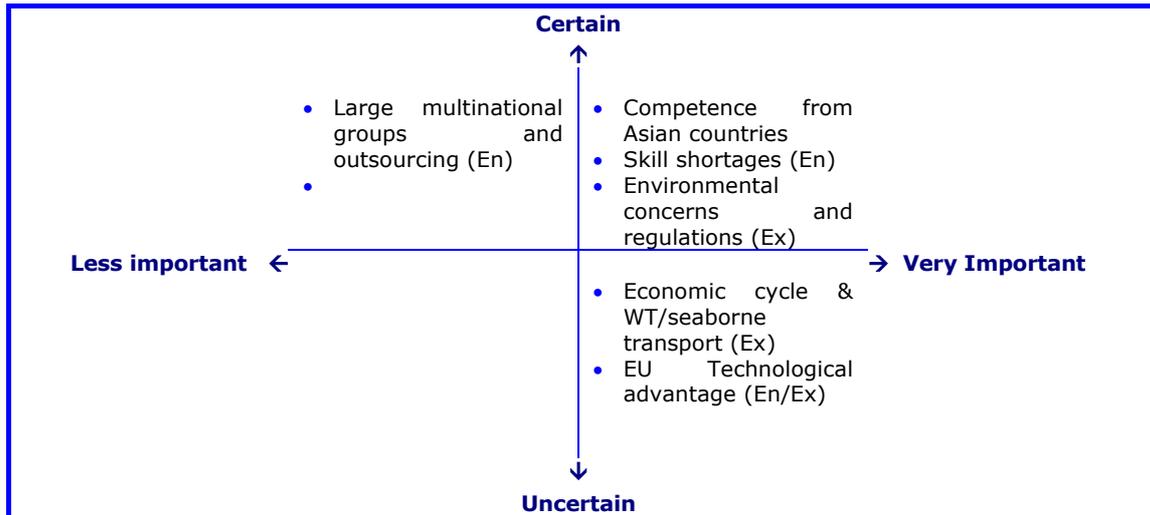


### 3. **SCENARIOS AND IMPLICATIONS FOR EMPLOYMENT TRENDS**

#### **a) Selection of key drivers of change for scenario building**

If the degree of certainty, the level of importance and the endogenous/exogenous character of the drivers of change are combined, it is possible to identify those regarded as crucial for the sector and thus the basis for the construction of scenarios.

**Table 4. Ranking of drivers of change**



Source: Own elaboration

As a result, the influence of the current adverse economic cycle on world trade/seaborne transport and thus on ship demand, together with the maintenance of the European technological advantage over the Asian competitor countries, emerge as the key factors which will shape the future of the sector in Europe.

#### **b) Hypotheses**

Two main variables have been selected in order to construct scenarios for the future European building and repairing of ships and boats sector. For each of them, two hypotheses (one favourable, one unfavourable) are made, thus defining 4 scenarios:

##### **1. Economic cycle and future evolution of world trade and sea transport:**

- Favourable hypothesis: small influence of economic cycle, with a rapid recovery of the world economy, growth of seaborne trade and high demand of ships and boats, particularly of specialised and high technology vessels
- Unfavourable hypothesis: the cycle has an important impact, generating a long term crisis (recession) that severely affects world trade. Demand of ships and boats is stagnant and the financial restriction affects particularly shipbuilding

##### **2. Preservation of the European technological advantage:**

- Favourable hypothesis: EU keeps technological competitive advantage against third countries, even if their capacity and production keeps on growing at high pace, though mainly of standard vessels
- Unfavourable hypothesis: Asian countries technological level progressively equals the European, together with the Capacity and production growth. European competitive advantage decreases rapidly



**c) Scenarios**

The combination of the former variables and hypotheses give place to the following scenarios.

**Table 5. Definition of future scenarios for the EU European building and repairing of ships and boats sector**

		COMPETENCE FROM THIRD COUNTRIES AND EU TECHNOLOGICAL ADVANTAGE	
		Favourable: EU keeps technological competitive advantage	Unfavourable: Asian technological level equals EU
ECONOMIC CYCLE AND WORLD SEABORNE TRADE	Favourable: Small influence of economic cycle	Scn1 ++	Scn2 +-
	Unfavourable: the cycle has an important impact	Scn3 -+	Scn4 --

Source: Own elaboration

- Scenario 1: Growing demand of ships and boats and preservation of EU technological advantage
- Scenario 2: Growing shipbuilding demand but loss of EU technological advantage
- Scenario 3: Stagnant shipbuilding demand but preservation of EU technological advantage
- Scenario 4: Stagnant shipbuilding demand and loss of EU technological advantage

**d) Implications for employment trends in the different scenarios**

The analysis distinguishes employment functions accordingly to their conceptual (i.e. marketing functions, R&D/design activities) or executive nature (i.e. production management, production/service activities, maintenance and repairing activities, quality and logistics activities). Also, the situation in the 'old' EU-15 Member States is differentiated from the new Member States (NMS), as the information shows a higher presence of personnel in executive activities in the NMS in comparison to the situation in the 'old' Member States (with a higher presence of people in conception-related functions and occupations).

**Table 6. Scenarios' implications for employment trends in the building and repairing of ships and boat industry**

	EU-15		NMS	
	Conception	Execution	Conception	Execution
Scenario 1: Growing demand of ships and boats and preservation of EU technological advantage	I	I	I	I
Scenario 2: Growing shipbuilding demand but loss of EU technological advantage	M	?	M	M
Scenario 3: Stagnant shipbuilding demand but preservation of EU technological advantage	M	D	?	D
Scenario 4: Stagnant shipbuilding demand and loss of EU technological advantage	D	D	D	D

'I': Increase the employment level  
'D': Decrease the employment level  
Source: Own elaboration

'M': Maintain the employment level  
'?': Uncertain trend

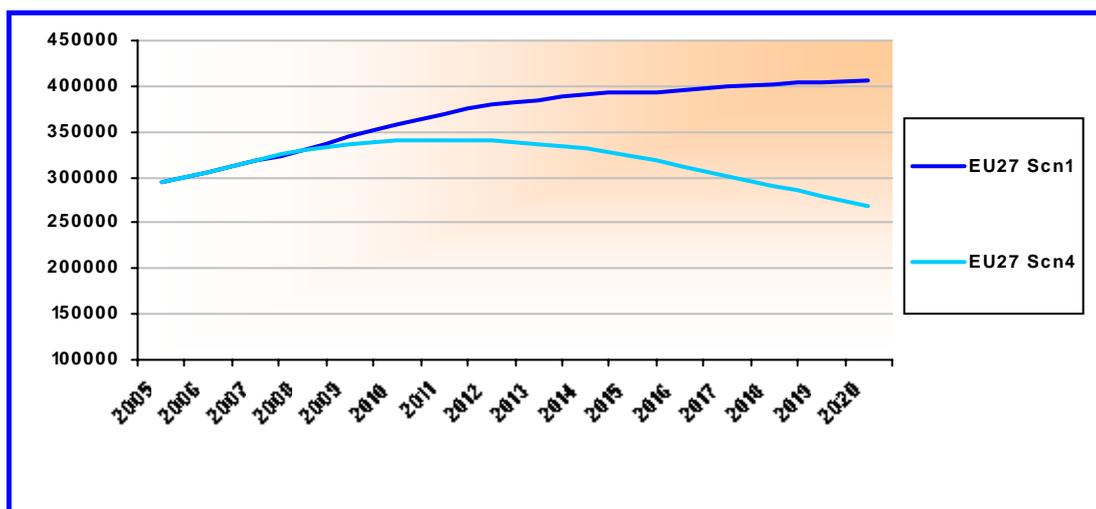


- ρ In Scenario 1, it can be expected an increase absolute terms in overall employment figures, both in the EU-15 and the NMS, together with an increase in the relative presence of conception-related jobs in Europe as a whole, specially important in the EU-15 Member States and relatively less important in the NMS (much more focused on manufacturing activities).
- ρ In Scenario 2, the world demand of high-tech ships and boats will not fully benefit the European sector, so that the absolute presence of both conception and execution-related employment would be maintained, both at EU-15 and NMS (in the EU-15 case, the absolute presence of execution-related jobs may be negatively affected by increasing subcontracting practices).
- ρ In Scenario 3, the stagnant demand combined with the need to continuously introduce new innovative solutions and products may result in the maintenance in absolute terms of conception-related employment levels, especially in the EU-15, whereas the situation in the NMS is less clear. Meanwhile, execution-related employment is expected to suffer from a decline for the whole of Europe.
- ρ Finally, Scenario 4 is expected to have very negative impact in terms of employment, both in the EU-15 and the NMS and for final assemblers and subcontractors, always in absolute terms, specially for execution jobs.

### e) Quantitative approach to employment evolution by scenarios

Scenarios 1 and 4 are considered, as they outline the more extreme situations for the sector evolution and its employment. Under scenario 1, the sectoral employment is supposed to grow at a cumulative yearly rate of 3.6% until 2012, according to shipyards previsions of high employment demand for the next years. However even in this positive scenario 1 (where the sector nearly is not affected by the current crisis), employment cannot grow indefinitely at the same rhythm as it is expected for these very good years and that the rate will slowdown progressively afterwards. As a result, in this scenario the sector might employ an overall figure of 380,000 persons by 2012 and of 400,000 persons by the end of the period, always at EU27 level.

**Graph 3. Employment forecast 2005-2020 for the EU-27 shipbuilding sector: Scenario 1 vs Scenario 4**



Source: Own elaboration. Based upon Eurostat, Structural Business Statistics (SBS); CESA Annual Report 2006-07; SSDC Report 2008

On the contrary, in scenario 4, employment evolution would not be as expansive even in the first period up to 2012, as a result of the economic and financial crisis and its consequences. Thus, it is assumed that employment would only grow slightly over a 1%



rate until 2012. This process, together with the increasing Asian competence and the progressive loss of the European technological advantage, would be accentuated afterwards, driving to a severe reduction of employment (yearly rate of about -3% until 2020). In overall figures, and in scenario 4, employment in the sector could still grow up to 340,000 people until 2012, but then would decrease down to 270,000 people in 2020, as a result of the very unfavourable market conditions assumed for the whole EU27.

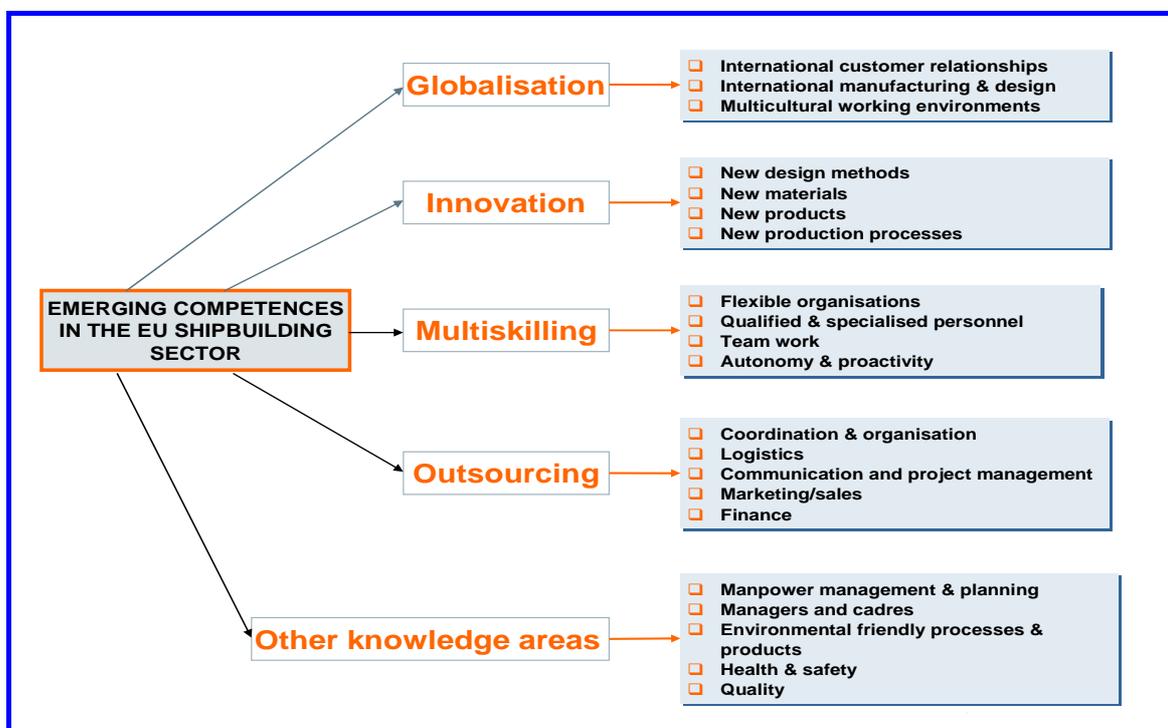


#### 4. IMPLICATIONS OF SCENARIOS FOR COMPETENCES AND OCCUPATION PROFILES

##### a) *Emerging competences in the shipbuilding sector*

The main drivers of change affecting the European building and repairing of ships and boat sector include, amongst others, a growing competence from third countries (which in turn requires an increasing internationalisation of the European sector), emphasis on RDI investments in new products/materials/manufacturing methods for maintaining the European competitive advantage, a growing demand of qualified and highly specialised personnel and, finally, increasing and more complex outsourcing practices (at international and/ or national level). All these drivers pose new expectations and possibilities for the sector, whereas in turn generate not only difficulties in recruitment (as already explained in a previous chapter) but also a change in the requested skill profiles and therefore a number of emerging competences.

**Graph 4. Emerging competences in the EU shipbuilding sector**



##### b) *Implications of the scenarios*

This section identifies, for the best and worst scenarios envisaged (Scenario 1 and Scenario 4, respectively), the implications for each occupational function in terms of jobs expanding, transforming or in decline.

##### ■ **Scenario 1: Growing demand of ships/boats and preservation of EU technological advantage**

The Scenario 1 is expected to have a positive impact in overall absolute employment figures. This positive impact can be expected particularly in some specific functions such as marketing and R&D/Design activities, together with production management functions, whereas in other functions (i.e. Financial and Administrative, Logistics, Quality, Production) the expected increases will be positive but probably less important.



**Table 7. Jobs in expansion, transformation or decline in two selected scenarios**

<b>Economic Demand</b>	<b>Existing jobs in expansion</b>	<b>Jobs in transformation</b>	<b>Jobs in decline</b>
Scenario 1: Growing demand of ships and boats and preservation of EU technological advantage	Particular expansion in Marketing, R&D/Design and Production management. Less relevant expansion in Finance and Administration, Logistics, Quality, Production. Production jobs particularly increases amongst suppliers and NMS. Conception-related functions (i.e. marketing functions, R&D/design activities) particularly increase amongst final assemblers and old EU Member States. Increase of the relative presence of conception-related functions.	All functions, specially amongst general management functions, R&D/Design functions and Production-related functions (including production-management functions)	Service-related functions (security guards, fire fighters, cleaners), due to external contracting practices:
Scenario 4: Stagnant shipbuilding demand and loss of EU technological advantage		All functions, especially as far as execution-related functions (i.e. production management, production/service activities, maintenance and repairing activities, quality and logistics activities). Decline of jobs in conception-related functions (i.e. marketing functions, R&D/design activities), although increase of relative presence in total employment.	All functions, particularly general management functions, R&D/Design functions, and Production-related functions (including production-management functions).

Source: Own elaboration.

Increases in employment figures for the productive function are expected to benefit to suppliers and NMS countries, whereas conception-related functions (i.e. marketing functions, R&D/design activities) might be expected to benefit especially final assemblers and old EU Member States. The relative presence of these conception-related functions is expected to increase, irrespectively where shipyards are located. Meanwhile, some service-related functions are expected to experience a decline due to external contracting practices to specialised suppliers, although this trend is already well established in the EU-15 Member States but yet to be accelerated in the NMS. Finally, general management functions are expected to maintain in time. Finally, existing jobs in all functions are expected to be affected by serious transformations in their nature and contents. In any case, some special functions will be particularly affected, such as general management functions, R&D/Design functions and Production-related functions (including production-management functions).

▪ **Scenario 4: Stagnant shipbuilding demand and loss of EU technological advantage**

The fourth scenario can be expected to have a very negative impact in terms of employment that is likely to affect all existing functions, specially as far as execution-related functions (i.e. production management, production/service activities, maintenance and repairing activities, quality and logistics activities). In any case, those conception-related functions might increase their relative presence in total employment, although this employment will be also affected by job losses. Finally, existing jobs in all functions will be affected by serious transformations in their nature and contents, irrespectively of market or competitive conditions. Some special functions will be particularly affected, such as general management functions, R&D/Design functions, and Production-related functions (including production-management functions).



## 5. **RECOMMENDATIONS**

### **a) Strategic choices of the European ship and boat building industry to meet labour and skill shortages**

The strategic options to be taken in the future by the European ship and boat building industry in order to address the future skills requirement, for the best and worst scenarios identified in previous sections) are presented next.

**Table 8. Strategic choices to meet skill needs**

Choices to meet Skills needs/ Scenarios	Changing work organisation	Training of employed workers	Recruiting unemployed workers	Recruiting young people	Recruiting workers from other Member States	Recruiting workers from abroad	Offshoring and outsourcing
Scenario 1: Growing demand of ships and boats and preservation of EU technological advantage	+	+	+	+	+	+	+
Scenario 4: Stagnant shipbuilding demand and loss of EU technological advantage	+	+	-	+	-	-	+

+: Relevant choice  
 -: Irrelevant choice  
 Source: Own elaboration

### **b) Strategic implications for education and training**

The main strategic implications obtained from the current research that can be derived for education and training institutions are summarised in next table.

**Table 9. Strategic implications for education and training institutions**

- Increased attention to training activities
- New skill requirement needs to be analysed and addressed, ideally through a sectoral social dialogue
- Streamlining the education/training supply with the training needs of enterprises through increased cooperation between relevant stakeholders
- Balanced regional distributions of education/training supply
- Importance of collaborative solutions within the sector
- Importance of specific public support for suppliers (specially SMEs) in their training activities
- Mutual recognition of professions
- Mutual recognition of educational and training systems and qualification standards in the sector
- Importance of recognising non-formal knowledge and skills acquired through practical experience
- Training-related counselling and advising activities for enterprises (specially SMEs)
- Importance of recognising and transmitting tacit knowledge from 'senior' to 'new' personnel'

Source: Own elaboration



**c) Recommendations for the different actors**

On the basis of all the previous steps and sections analysed in the current research, it is possible to identify a number of recommendations for the different actors of the sector in order to identify strategic choices to be made in order to meet the future skill requirements. In this sense, these recommendations are distinguished between different stakeholders, namely companies, workers, public authorities (EU, national and regional ones) and education and training institutions

**Table 10. Recommendations, distinguished for the different stakeholders**

Recomendations	Concerned stakeholders					
	Companies	Workers	EU authorities	National authorities	Regional authorities	Education and training institutions
Develop the European ship and boat building and repairing industry as a key and strategic activity for the European economy in the coming years	X	X	X	X	X	X
Develop activities that may help both retaining the existing sector workforce and recruiting new personnel	X	X	X	X	X	
Importance of incorporating women to the sector	X	X	X	X	X	
Importance of recruiting and maintaining foreign personnel	X		X	X	X	
Learning from and collaboration with other sectors	X					
Importance of co-operative strategies between the sector and other related stakeholders	X	X	X	X	X	X
Reinforcement of social dialogue practices in the sector	X	X				
Exchange of good practices at EU level	X	X	X	X	X	X
Increased attention to training activities	X	X	X	X	X	X
New skill requirement needs to be analysed and addressed, ideally through a sectoral social dialogue	X	X				
Streamlining the education/training supply with the training needs of enterprises through increased cooperation between relevant stakeholders	X			X	X	X
Balanced regional distributions of education/training supply				X	X	X
Importance of collaborative solutions within the sector	X					
Importance of specific public support for suppliers (specially SMEs) in their training activities			X	X	X	
Mutual recognition of professions	X	X	X			
Mutual recognition of educational and training systems and qualification standards in the sector			X	X		X
Importance of recognising non-formal knowledge and skills acquired through practical experience			X	X		X
Training-related counselling and advising activities for enterprises (specially SMEs)	X			X	X	X
Importance of recognising and transmitting tacit knowledge from 'senior' to 'new' personnel'	X	X				

Source: Own elaboration



***d) Concluding remarks***

This report has put forward the serious challenges that the European shipbuilding is facing in a difficult financial and economic context, where the increasing competence of emerging Asian countries is questioning the European position in the world market. The sector's technological advantage and its specialisation in high-tech products (cruisers and ferries, non-standard container vessels, specialised ships,...) seems the most valuable strength upon which foster the future of an important sector in the European economy.

In this sense, sectoral employment and training strategies must be oriented to secure a sufficient supply of highly qualified personnel, according to the innovation and R&D the sector has established (Waterborne). For this, it is of utmost importance to maintain the high level of social dialogue the sector has been able to achieve, and to design and develop employment and training actions agreed both by employers and workers representatives. Also, collaborative approaches involving the critical suppliers subsector need to be devised.