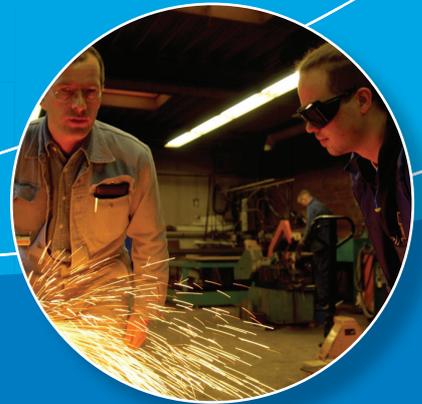




HR Research Study:

“Demographic Change & Skills Requirements in the European Shipbuilding & Ship Repair Industry”



Authors: Pieter 't Hart / Dick Schotte

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1. Foreword

We have the great pleasure to present the following study which is the third joint project developed by the European Metalworkers' Federation (EMF) and the Community of European Shipyards' Associations (CESA) in the context of the European Sectoral Social Dialogue Committee on Shipbuilding and Ship Repair (SSDC). This HR study outlines a picture of the development of demographic change and skills requirements in the European shipbuilding and ship repair sector on the basis of national surveys and interviews.

In this process, companies, trade unions, works' councils and national associations were consulted. This project is, therefore, an excellent example of the type of dialogue possible that should be intensified on national and international level in the future, if we want the issues described in this report become reality.

Sometimes dissents may occur between shipyard management and representatives of trade unions because of conflicting interests. However, both sides have the same basic interest in that a healthy sustainable European industry goes on in the future. For this, the European Shipbuilding Social Dialogue Committee is an important vehicle towards a more common understanding between shipyards and trade unions and should therefore intensify its work and provide a framework for the social dialogue on regional and local level.

The study recommends looking for solutions regarding education and training as well as shortage of personnel in the sector due to demographic change. This asks for constructive consideration, with the goal to create solutions in time, taking outsourcing and image upgrading into account. Wherever possible, the SSDC will fully support any initiative in this respect at European level, however, the effective implementation has to be realised at national and company level.

Within the European Union, workers and companies benefit from the freedom of movement. However, different social standards within the community can also cause frictions, which the social dialogue can help to solve. The European social partners therefore endeavour to address the question of basic principles related to social standards. Such a dialogue will also make a contribution to the positive public perception of the sector, which is essential for the recruitment efforts of the shipyards.

On 5 and 6 June 2008, the results of this study will be presented at the HR workshop in Koudekerke (NL), and based on this, best practice initiatives and programmes will be discussed. As a result, the SSDC and the social partners at national level should be provided with recommendations for building a framework for training and qualification policies in their future work that should be as definite as possible.

We hope that, with this HR study and the subsequent workshop, we can smoothen the path of HR policy for the European shipyards and social partners.

Henk van Beers
Chairman SSDC

Ruud Schouten
Vice-Chairman SSDC

Peter Scherrer
EMF General Secretary

Reinhard Lüken
CESA Secretary General

2. Aim of the study

The main aim of this project is to identify the problem relating to demographic change in the European shipbuilding and ship repair industry with regard to skills requirements over the next 5 years and to provide an outlook for the next 10 to 15 years.

This study provides an analysis of the present situation as well as the future changes in the European shipbuilding and ship repair sector in order to improve expertise in personnel management. By obtaining an in-depth understanding, it is possible to assess the present and future impact of demographic change and thus have a basis for eventually establishing a long-term strategy with possible solutions for skills requirement in the shipyard sector, i.e. support of adaptability of workers and lifelong learning strategies.

The project investigates the current HR structure in the European shipyards and ship repair yards with regard to ageing, qualifications and skills requirements in order to identify possible measures for (re-)training management and gives a 5-year-forecast and a long-term outlook on recruitment as well as skills shortage.

The social partners in the shipbuilding and ship repair industry have realised that the future of their sector depends on productivity and competitiveness as well as on the qualification of the workforce and developed this project which forms a core element of their work programme.

3. Description of the project

The project consists of two main steps:

- A research study leading to a report on the current situation, identifying the problems and giving in-depth understanding. This report will be translated and published before the European workshop.
- A European HR workshop - bringing together social partners of the shipbuilding and ship repair sector - to discuss the results of the study and exchange experience on existing initiatives and reflect on potential solutions for the future. A report will summarise the speeches and subsume the results of the workshop.

4. Methodology

The research study provides an aggregate age and qualification profile of the shipbuilding and ship repair sector at European level collecting data in 14 CESA and EMF member countries, namely Croatia, Denmark, Finland, France, Germany, Greece, Italy, Malta, The Netherlands, Poland, Portugal, Romania, Spain and the United Kingdom. In this report, these countries are referred to as the “EU-14 shipbuilding industry”. The study comprises the following steps:

- a. Definition of a limited number of major professions listed in a glossary in order to speak a common language and make the professions comparable
- b. HR data collection at national associations and shipyards in 14 CESA & EMF member countries
- c. Compilation and analysis of HR data for the next five years
- d. Integration of comments and amendments of the social partners
- e. Approval by the Shipbuilding Social Dialogue Committee
- f. Translation into German, French, Italian, Polish and Spanish.
- g. Finishing and publication of the study report

The aggregation of data available at national level for the research study was carried out by two HR experts with expertise of how shipyards are operated. The relevant data were collected by distributing a questionnaire via the national associations. Subsequently, the HR experts travelled to the countries involved and interviewed the social partners to obtain additional information on the basis of the aggregated data.

The HR Research Study was divided into 4 Work Packages:

Work package 1 (Dec.2007 – Jan. 2008)

The starting point for the study was the project preparation including the development of the HR survey comprising a questionnaire and a glossary of the major professions in shipbuilding, qualifications and skills profiles by a small working group, which consisted of the leading HR expert and representatives of the social partners at CESA and the EMF (see annex 1). Before sending out the questionnaire and starting the HR survey, the HR departments of some large shipyards in Germany, The Netherlands and France were asked to test and assess the draft questionnaire in advance.

Work Package 2 (Jan. 2008 – Mar. 2008)

The final questionnaire and a supporting glossary of terms were sent out to the national associations and several shipyards to accumulate quantitative data on the shipbuilding industry and gain insight in the requirements per country and per type of shipyard (see annex 2). In the same letter, the contact persons were informed about the planned interviews in the countries scheduled in March and April 2008 with the qualitative data from the questionnaires used as a basis for the discussions in the countries. It was suggested to activate national working groups for this purpose consisting of responsible (HR) representatives of the shipyards and also to invite a member of the social partners, since the study is a joint co-operation between CESA and the EMF.

Work Package 3 (Mar. 2008 – Apr. 2008)

Interviews were held with representatives of national associations, shipyards and trade unions of Croatia, Denmark, Finland, France, Germany, Italy, The Netherlands, Poland, Portugal, Romania and Spain. During the interviews, the results of the questionnaires were evaluated and trends and developments in HR in shipbuilding were extensively discussed. An overview of interviewed persons is provided in annex 3.

Work Package 4 (Apr. 2008 – May 2008)

The last phase of the HR study encompassed the analysis of the interviews and the writing of the report. The first draft report was distributed for evaluation and commenting by the working group and the social partners/SSDC members. The final report was ready by mid May 2008.

The HR research study was finalised before the HR workshop since it will form the basis and starting-point for the discussions at the conference which are expected to lead to the possibility of building a frame for training and qualification policies.

5. How to read the report

The first five chapters of the report provide the introduction to this study with its aim, description of work and working methodology. Chapter 6 provides an overview of the current situation in the European shipbuilding and ship repair industry with regard to Human Resource developments. Chapter 7 gives insight in the future developments in Human Resources based on the results of the questionnaires as well as the interviews with representatives of the various European shipbuilding countries. Finally, Chapter 8 gives an overview of the conclusions of the results of the questionnaires and interviews as well as some recommendations for future actions.

The blue graphs in the report are derived from Eurostat data, orange graphs indicate the present status of the EU-14 shipbuilding industry, purple graphs provide an overview of the expected need in shipbuilding and finally the red graphs give information on finances.

In the report, some paragraphs are written in italics. These paragraphs are quotations from other publications and interviews held with representatives of national associations, member shipyards, works' councils and/or trade unions.

6. Current size and structure of the European Shipbuilding Industry

The European shipbuilding industry is very diverse in company size and structure. The company workforces range from tenths to thousands of employees. Some shipyards focus on new building of ships, others on repair and maintenance. Some shipyards focus on specific innovative ship types, others focus on process innovation, building a variety of ship types. Some shipyards build for commercial clients, others for consumers or governments. Although there is an enormous variety in companies and their workforces, they are all engaged in the shipbuilding industry.

The shipbuilding industry is internationally oriented and cyclic in nature. At present, more than three hundred European shipyards are experiencing the biggest shipbuilding boom over the last 40 years, with an accompanying boom in maintenance, repair and conversion work on the existing fleet. The image of shipbuilding is good and still improving.

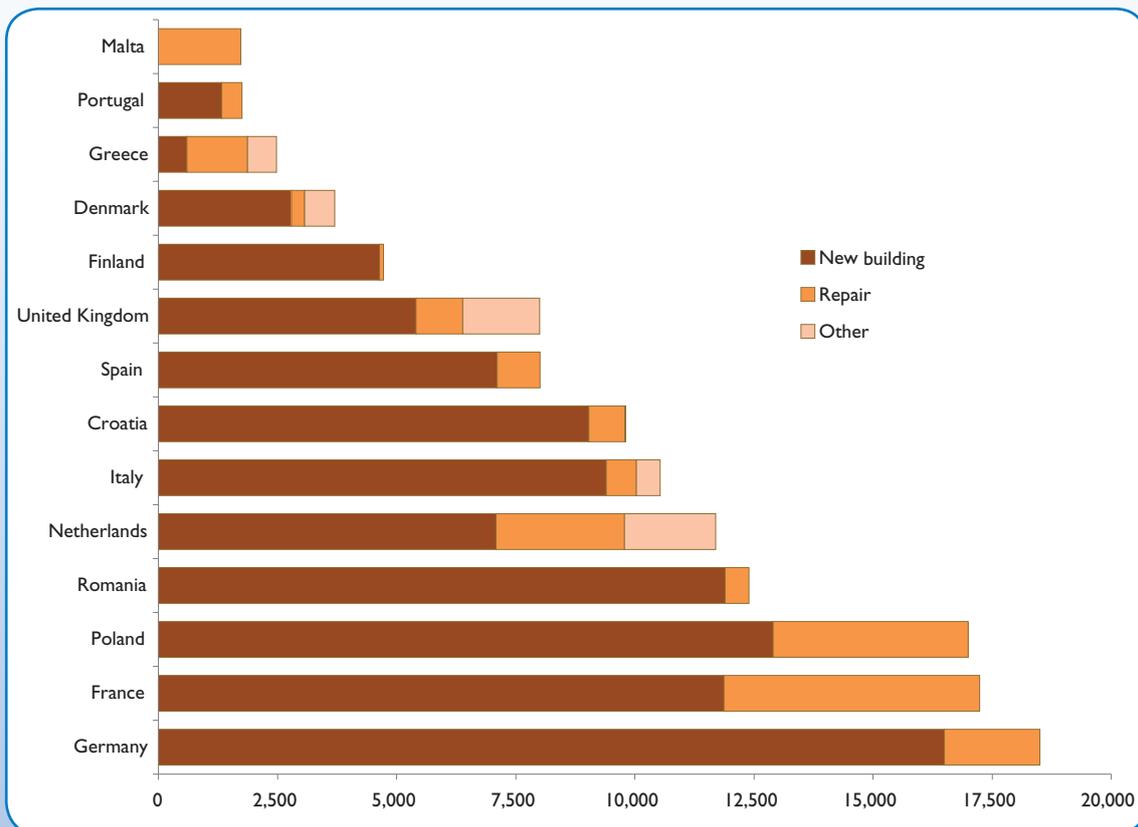


Figure 1: EU-14 Shipbuilding total workforce

The European shipbuilding industry is a high-tech industry providing direct employment for more than 150,000 people in Europe. Subcontractors, indirect employment and temporary personnel are not included in this figure. Fig. 1 provides an overview of the total number of shipbuilding employees per country subdivided into new building, repair and other activities.

Based on the results of the questionnaires, the total workforce in the 14 countries participating in the HR research study (EU-14 shipbuilding industry) is about 127,500 people. About 100,000 people are active in new building, 22,000 people work in ship repair and maintenance services and 5,500 people work in other activities such as specialised shipbuilding carpentry or marine mechanical and/or electrical engineering. Of these 127,500 people working in the EU-14 shipbuilding industry 103,000 people are defined as technical employees (81%) working in technical sales, after sales, design, engineering, work preparation and production.

Since the shipbuilding industry as original equipment manufacturer has a strong focus on subcontracting, it is estimated that at least 600,000 people are employed directly and indirectly in the European industry sector.

“The Spanish Shipbuilding industry is presently healthier than ever. Although the pay-roll employment amounts to about 8,000 workers, the number of subcontractor employees directly involved in the shipbuilding is high and growing rapidly. The total number of pay-roll employees plus subcontractor employees reaches the figure of 15,000 to 17,000 persons. So about 100% of the workforce is also employed in the industry through subcontracting.” (Source: Interview Uninave April 2008)

6.1 Demographic situation and forecast for the European workforce

The ageing workforce in Europe provides an enormous challenge. Although the total population of the EU-25 will only fall slightly by 2050, Eurostat projections, which form the basis for Fig. 2, show that the age structure will change dramatically.



Figure 2: EU-25 demographics 2000 /2025 / 2050

“By 2050, the EU will have lost 48 million people of working age (15- to 64-year-olds) and will have gained 58 million pensioners (65 and over). This means that fewer workers will pay for more pensions. From four people of working age supporting one pensioner in 2004, this ratio will drop to two to one by 2050.” (Source: European Economy News January 2006).

6.2 Demographic situation in the EU-14 shipbuilding industry

A comparison of the present results of the age distribution in the EU-14 shipbuilding industry with the entire European workforce based on the available Eurostat data (2004) shows that the EU-14 shipbuilding industry has a slightly older workforce than the European totals.

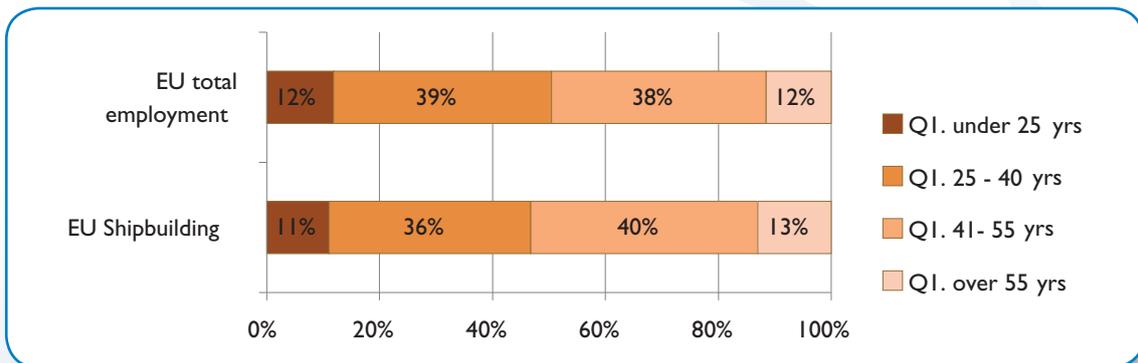


Figure 3: EU-25 total workforce versus EU-14 Shipbuilding workforce.

Fig. 3 indicates that the European shipbuilding industry is not facing a more severe problem with regard to ageing than the entire European workforce. When looking at the national figures in more detail, there are quite some deviations to be noted. These figures are shown in Fig. 4 and sorted by age group up to 40 years.

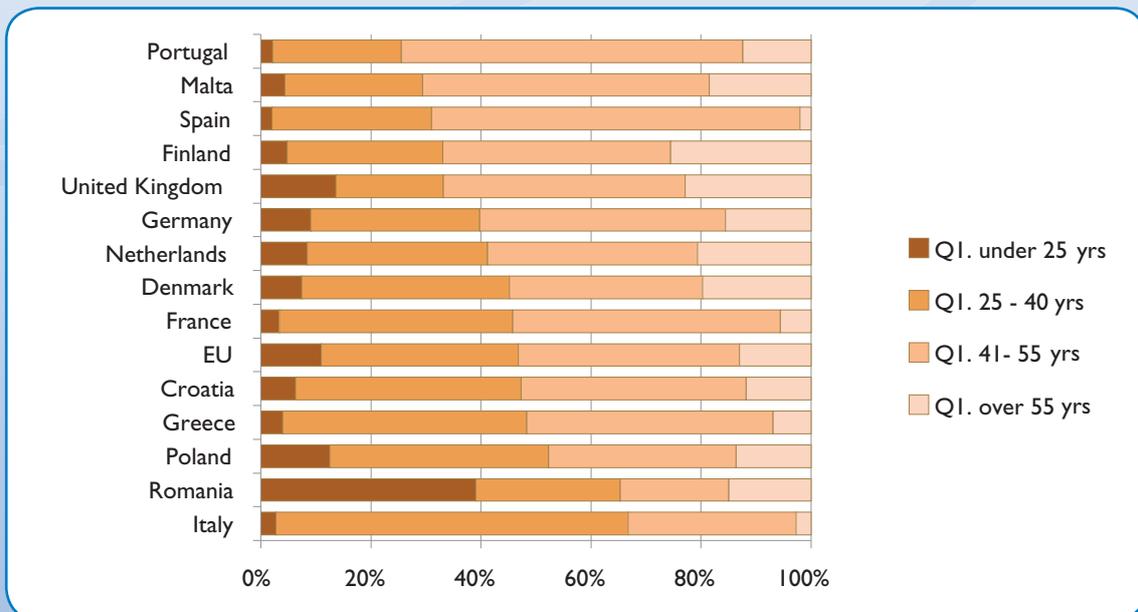


Figure 4: EU-14 Shipbuilding technical workforce - age distribution under 40 years old

The average age distribution per country of the EU-14 shipbuilding industry is separately indicated. Generally speaking (with the exception of Malta), the South-East European countries have a relatively young workforce while the North-West European countries have a relatively older workforce.

The Italian shipbuilding industry has the largest technical workforce below 40 years of age (67%). There are many skilled workers between the ages of 25 to 40 with only 3% of the employees older than 55 or younger than 25. The Portuguese shipbuilding industry has the oldest workforce with almost 75% of the employees over 40 years of age. This situation has developed due to the fact that during the 1970s Portuguese shipyards had to make contract agreements that are hampering the recruiting of new employees until today.

Only three countries have a shipbuilding workforce under 25 years that matches the average European figures above (Romania, Poland and United Kingdom). Especially Romania has a large workforce under 25 years of age (39%), which strongly contributes to the average age of people working in the EU-14 shipbuilding industry under 25 years (11%).

Romania is one of the European countries where shipbuilding has a very good image. According to the Romanian shipbuilding association Anconav, the need for skilled workers in Western Europe and the United States of America as well as higher wages have led to a substantial demographic move of shipbuilders towards these countries.

In 2006 and 2007, Romania lost about two thousand skilled workers per year due to this trend. The high percentage of young people in Romania is therefore considered with some reservation, since it usually takes about five years of working experience in order to become a skilled worker.

6.3 Outlook on shipbuilding workforce in the next ten to fifteen years

The age distribution of the EU-14 shipbuilding workforce also provides an outlook on the next 10 to 15 years with regard to the shortage of personnel. Fig. 5 gives an overview of the age distribution per country, sorted by the age group over 55 years. About 13% of the European shipbuilding technical workforce is older than 55 years. Roughly speaking, this means that on an annual basis about 1% of the European shipbuilding workforce will retire within the next ten to fifteen years.

Looking at their national figures, countries like Finland, United Kingdom, The Netherlands and Denmark should consider serious investments in securing shipbuilding knowledge and skills, since they are about to lose over 20% of their employees in the next ten to fifteen years due to retirement alone.

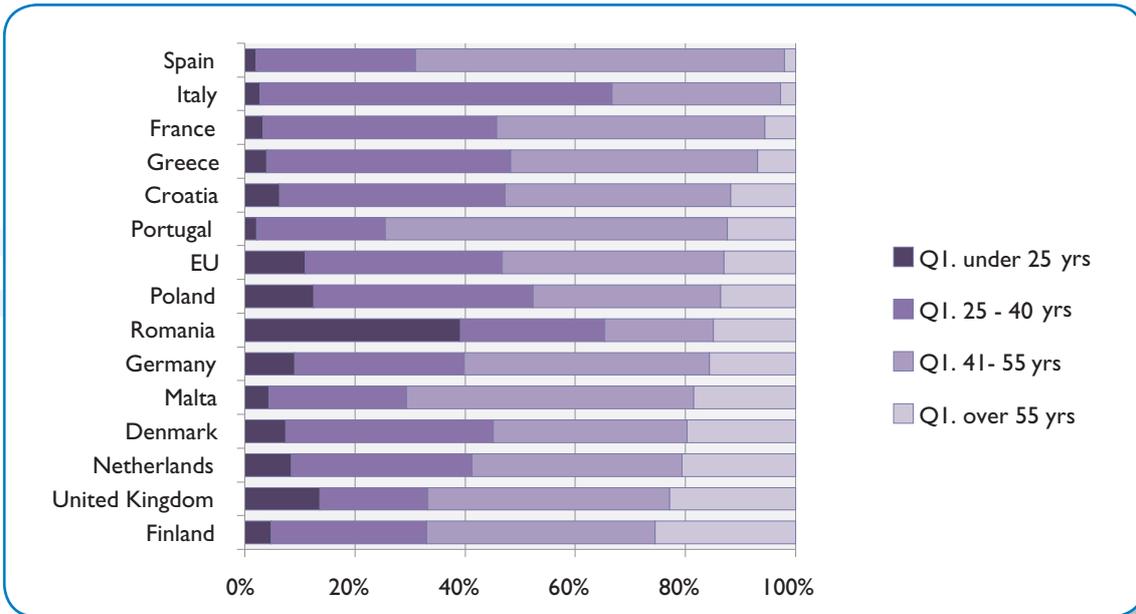


Figure 5: EU-14 Shipbuilding technical workforce - age distribution over 55 years old.

6.4 EU-25 Demographics versus Human Resources in Science and Technology

Eurostat also provides age pyramids for Human Resources in Science and Technology Core (HRSTC) compared to the entire European workforce (Figure 6). HRSTCs are individuals who have successfully completed their education at the third level in a science and technology field of study (Master of Science / Bachelor of Science) and are employed in a 'science and technology' occupation. Fig. 6 shows the total EU workforce as well as HRSTCs.

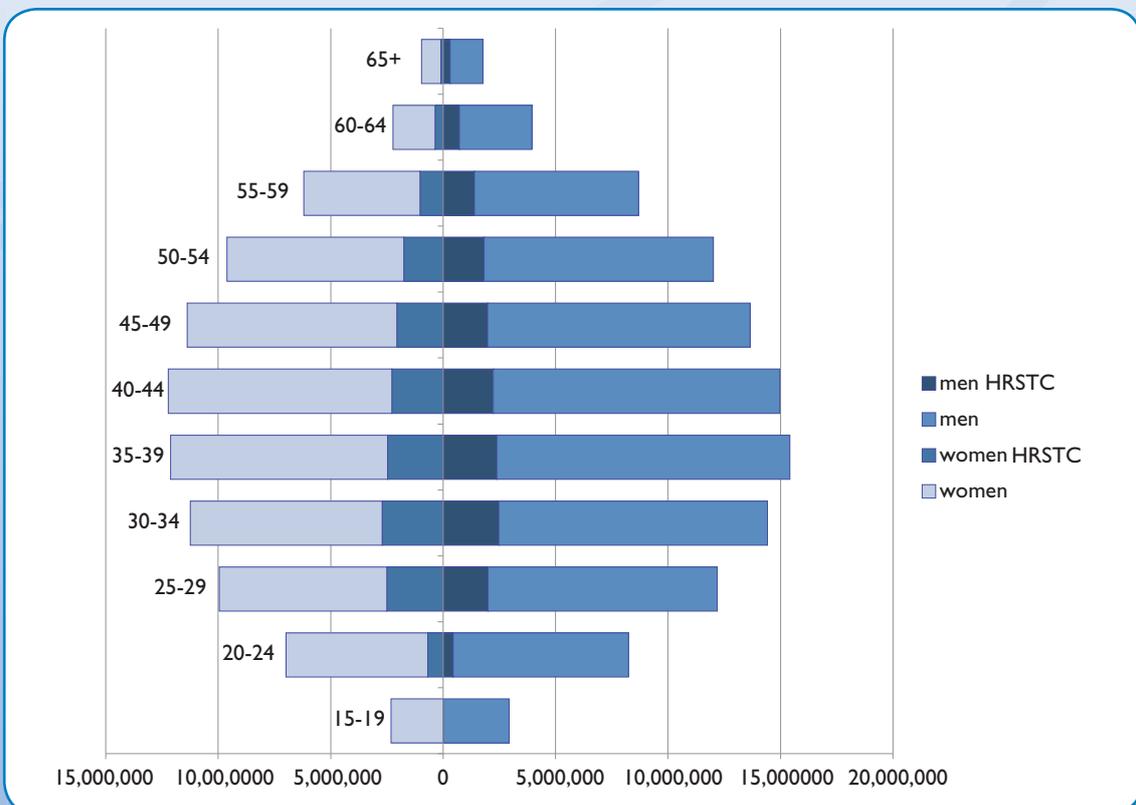


Figure 6: EU-25 Demographics and HRSTCs

“The base of the age pyramid for the total workforce is smaller than the middle, indicating a possible future scarcity of workers in the EU. However, looking at the HRSTC (MSc/BSc level), possible future shortages of this highly productive labour force could be less severe than for other types of employees. This is illustrated in Fig. 6 where the smaller HRSTC part bears much more resemblance to a pyramid. The broadest part of the HRSTC pyramid is found in the age group 30-34, an age at which the majority of the individuals in the workforce have completed their formal education.”
 (Source: Eurostat - statistics in focus - edition 11/2006)

6.5 Human Resources in Science and Technology Core in the EU-14 shipbuilding industry

The European shipbuilding industry is a high-tech industry, one indicator of which is the education level of the high-skilled workforce working in this industry. Eurostat figures indicate that of the entire European work population on average 15% of the employees belong to the Human Resources in Science and Technology Core, having a tertiary education in science and technology (MSc/BSc level) and being employed in a ‘science and technology’ occupation.

In the EU-14 shipbuilding industry on average 19% of the employees have a tertiary education in science and technology (MSc/BSc level). Fig. 7 gives an overview of the education level of employees in the European shipbuilding industry sorted by MSc/BSc level.

The average figure of 15% HRSTC within the entire EU-25 workforce is represented in the graph by Romania. This means that 11 out of the 14 European shipbuilding countries investigated show an above average employment of people at MSc/BSc level.

From this graph we can observe that Spain, France and Finland have a shipbuilding workforce with over 20% of the employees holding a Master’s or Bachelor’s degree. Spain even reports 35% of the people working in the Spanish shipbuilding industry with tertiary education.

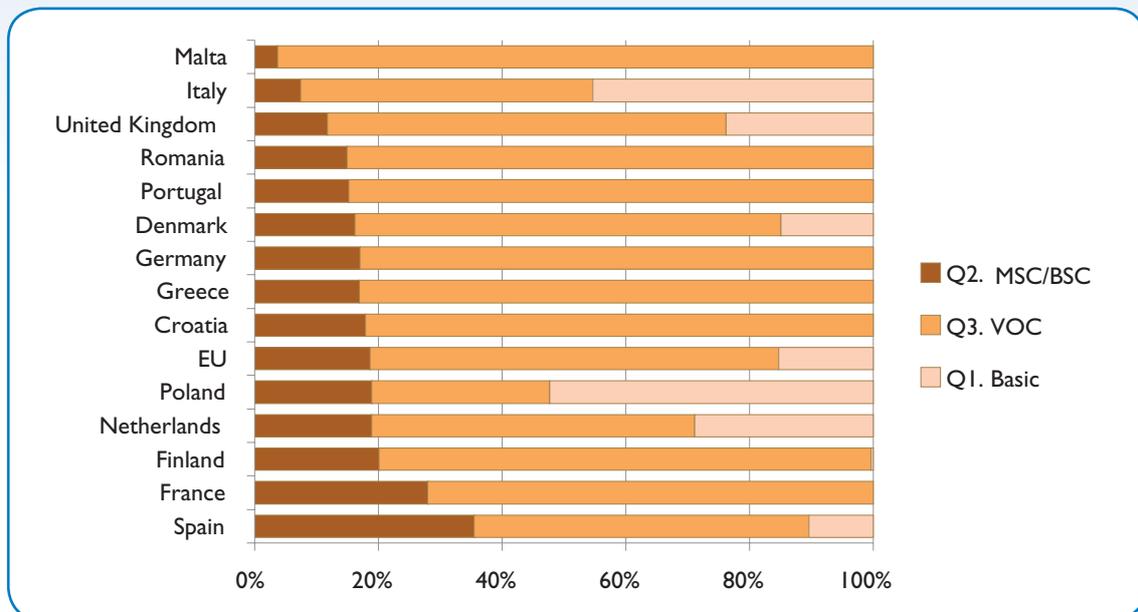


Figure 7: EU-14 shipbuilding workforce and HRSTC

6.6 Human resources at vocational level

Another indicator for the education level is the number of employees with a highly skilled vocational training working in the industry. 66% of the employees working in the shipbuilding industry have undergone vocational training and finished their studies with a vocational certificate. During the interviews in the various EU shipbuilding countries, it became clear that vocational training programmes greatly differ in each country.

Fig. 8 shows the same data as shown in Fig. 6 with the difference that the data below are sorted according to basic education level. The graph shows that in 8 out of the 14 EU-shipbuilding countries all employees hold either a vocational certificate and/or an MSc/BSc degree.

Based on the interviews, it is also concluded that, at present, all employees starting to work in the European shipbuilding industry have either a vocational certificate or a Master's or Bachelor's degree. Employees without any vocational certificate or tertiary education are gradually disappearing from the shipbuilding industry.

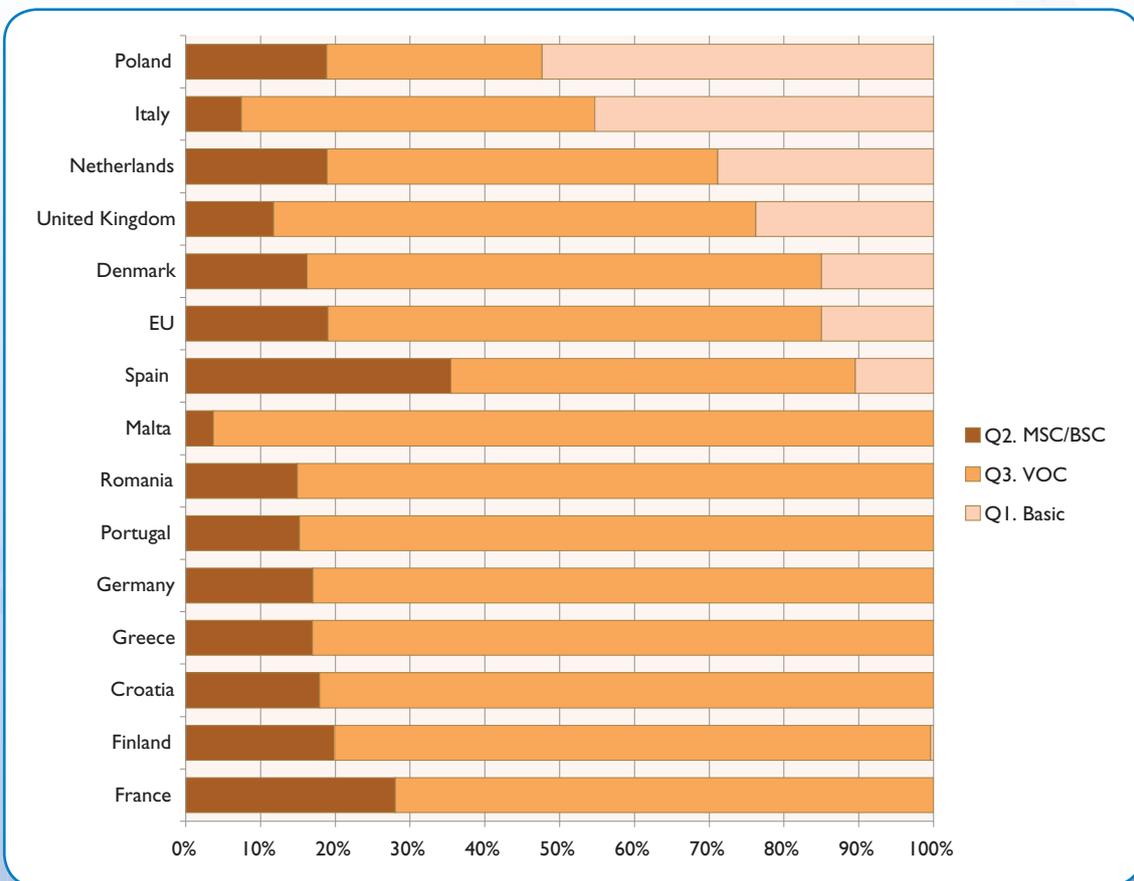


Figure 8: EU-14 shipbuilding workforce sorted by basic education level

6.7 Distribution of technical functions in the European shipbuilding industry

An indicator for the required qualifications of employees in the shipbuilding industry is the distribution of functions. In the glossary of terms (see annex 2), the technical professions in the shipbuilding industry are divided into three major function areas:

- sales and after sales (also referred to as sales)
e.g. estimators, account managers, proposal engineers, after sales managers
- design and engineering (also referred to as design)
e.g. designers, naval architects, structural engineers, draughtsmen
- work preparation and production (also referred to as production)
e.g. general planners, project managers, dockmasters, foremen, welders, fitters

The differentiation between the function group “production” and the other two function groups did not pose any problems. However, some respondents regarded the differentiation between sales and design as unclear, since sales engineers and technical estimators can be regarded as employees in either sales or design. Although the glossary of terms provides assistance in this area, it has to be noted that the differences between sales and design activities are not always as prominent in the day-to-day shipbuilding practice.

6.8 Distribution of functions for technical employees at all levels

Fig. 9 presents an overview of the distribution of functions for all technical employees working in the European shipbuilding industry.

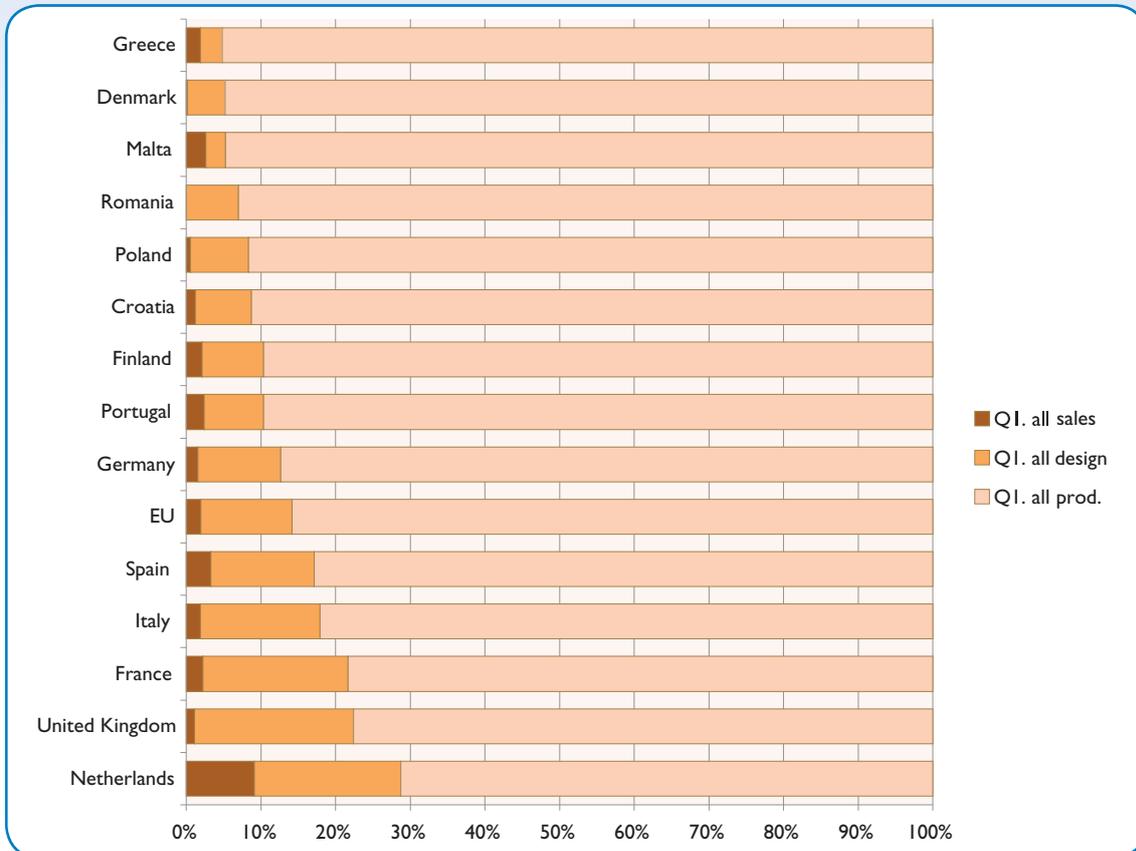


Figure 9: Distribution of technical functions for all levels of education

The EU-14 shipbuilding averages indicate that only 2% of the technical shipbuilding personnel works in sales and after sales, 12% in design and engineering and 86% in work preparation and production. In five countries, more than 90% of the workforce is employed in work preparation and production. The Netherlands, the United Kingdom and France have less than 80% of their technical workforce employed in work preparation and production. The Netherlands, with the least people employed in work preparation and production, still has over 70% of its technical employees working in this area.

6.9 Distribution of functions for technical employees with a vocational training

The EU-14 shipbuilding average for people with a vocational training employed in work preparation and production is even 91%. Eleven out of the EU-14 shipbuilding countries employ over 85% of the technical workforce holding a vocational certificate in work preparation and production. The distribution of functions for technical people with a vocational training is represented in Fig. 10.

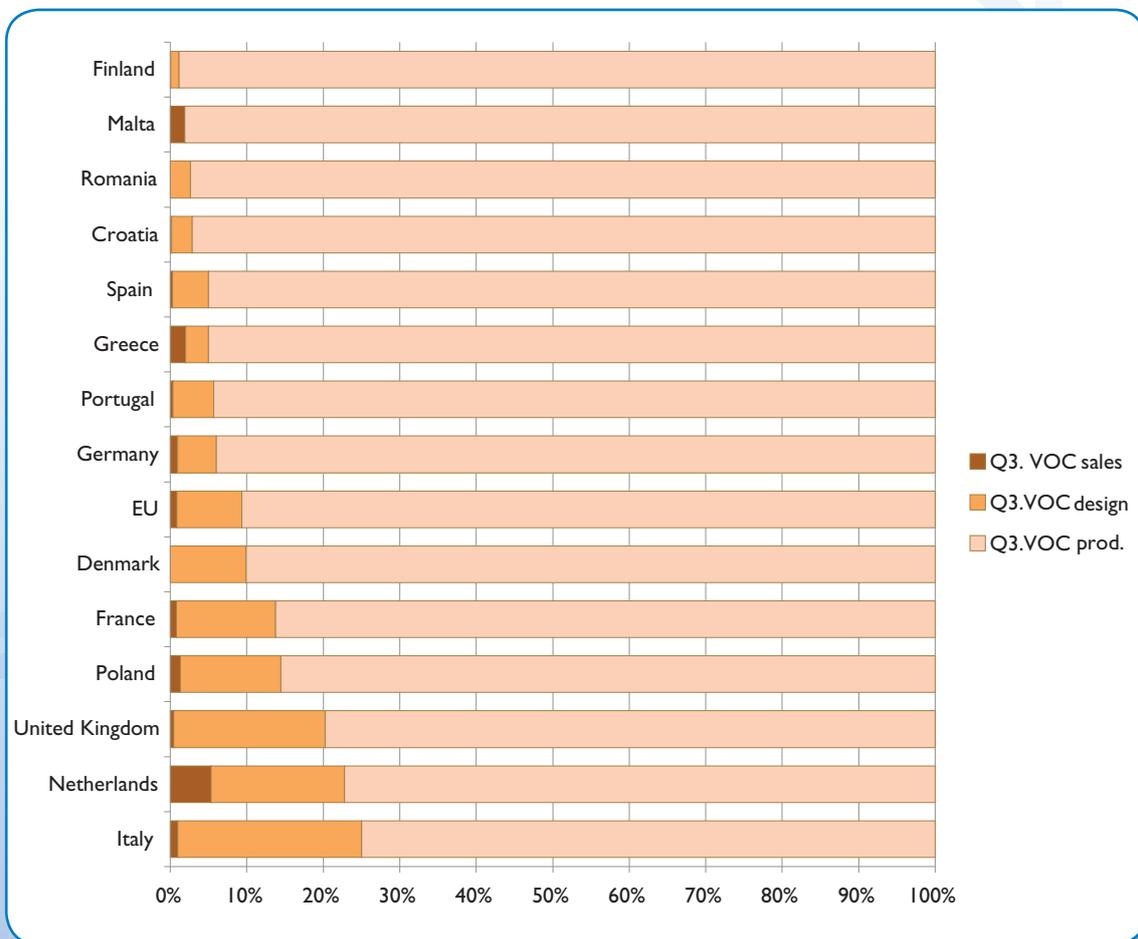


Figure 10: Distribution of technical functions for employees with a vocational training

Italy has the highest percentage of people with a vocational training working in design and engineering activities (24%), followed by the United Kingdom (20%). The Netherlands has the highest percentage of people with a vocational training working in sales and after sales activities (5%).

6.10 Distribution of functions for technical employees at MSc/BSc level

The largest variety in functions is found at MSc/BSc level (see Fig. 11). The distribution of Master of Science and Bachelor of Science functions is widely spread. The EU-14 shipbuilding average indicates that almost 49% of the shipbuilders with a Master's or Bachelor's degree are active in the field of work preparation and production. However, in the Greek shipbuilding industry 95% of the people with an MSc/BSc degree work in production while in the Maltese shipbuilding industry this figure is only 15%.

It is noted that the large European shipbuilding countries employ less than 25% of their tertiary educated people in the area of work preparation and production. Only five European countries have more than 10% of their employees with a MSc/BSc degree employed in the area of sales and after sales.

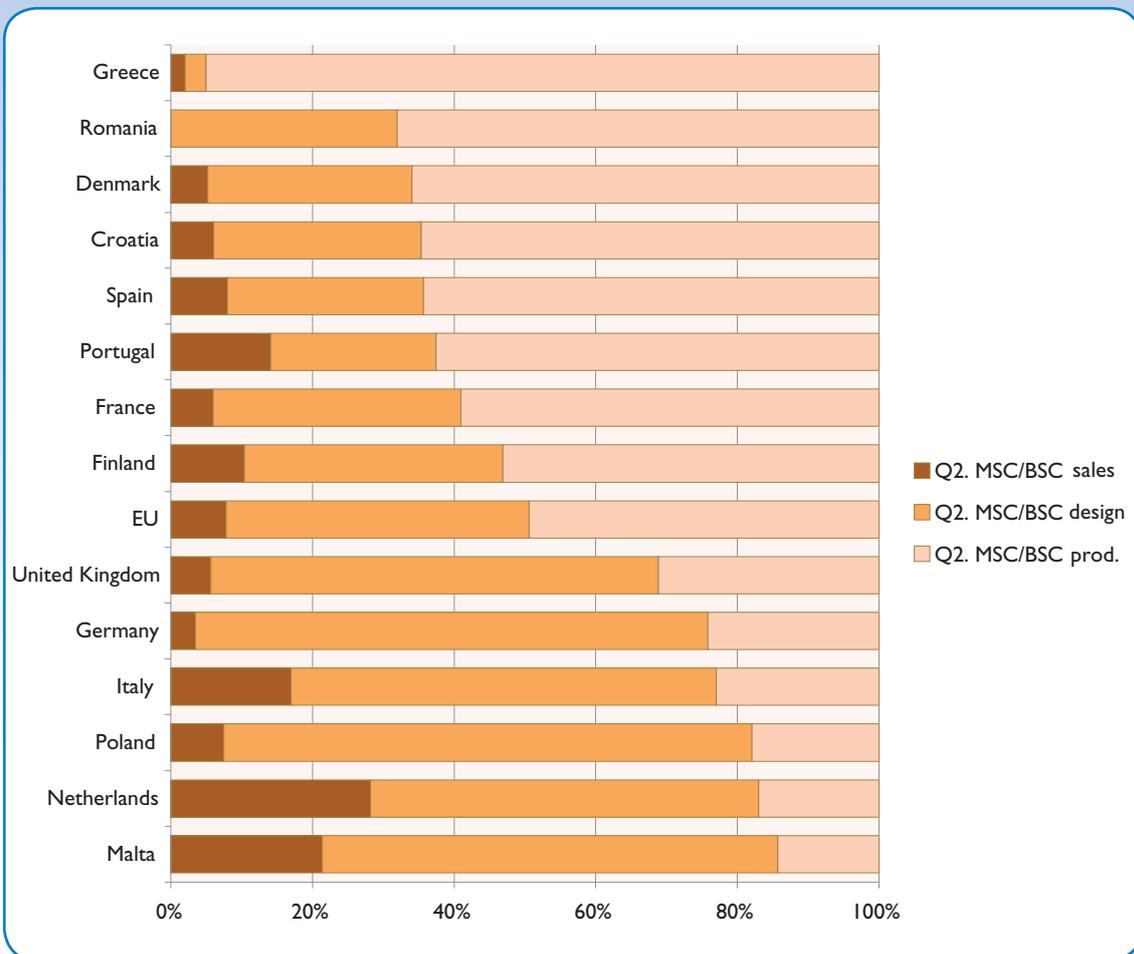


Figure 11: Distribution of technical functions at MSc/BSc level

7. Forecast and outlook for the European Shipbuilding Industry

The European shipbuilding industry is internationally oriented and very cyclic in nature. After some difficult years in 2003, 2004 and 2005, the European shipbuilding industry is presently experiencing the biggest shipbuilding boom in the last 40 years.

The demand for a skilled shipbuilding labour force has therefore increased rapidly. This is enforced by the trend that many baby boomers, born just after the Second World War, have just retired or are about to retire in the coming years until 2010. This rapid development of need for personnel cannot be solved by education and training alone. Education and training will usually take 2 to 5 years and although the need for personnel will certainly continue, this will not solve the short-term problems of the shipyards today and tomorrow. At the moment, subcontracting and employing people from other sectors in the Metal and Electrotechnical Industry are the best ways to solve the problem of skills shortage.

In the questionnaire for this HR Research Study, national shipbuilding associations and shipyards were asked to estimate the required annual need for technical personnel over the next five years. In this annual need both retirement of older personnel and natural migration of employees to other companies had to be taken into account.

The total annual need for the European shipbuilding industry for new personnel is estimated at 11,000 people. This is almost 11% of the EU-14 shipbuilding technical workforce.

Although no European figures are available for the natural migration of employees, some estimate this migration at about 4%, retirements not included. From paragraph 3.1 it was concluded that annual retirements for the EU-14 shipbuilding industry constitute approximately 1% of the total technical workforce. Based on these assumptions the EU-14 shipbuilding industry technical workforce have to grow by 6% per year over the next five years.

The annual need for technical employees in the EU-14 shipbuilding industry is represented in Fig. 12. The expected annual need for technical employees is dominated by Romania and Poland. Together they represent 46% of the total need in shipbuilding. Both, Romania and Poland have seen a huge demographic shift in personnel over the last years.

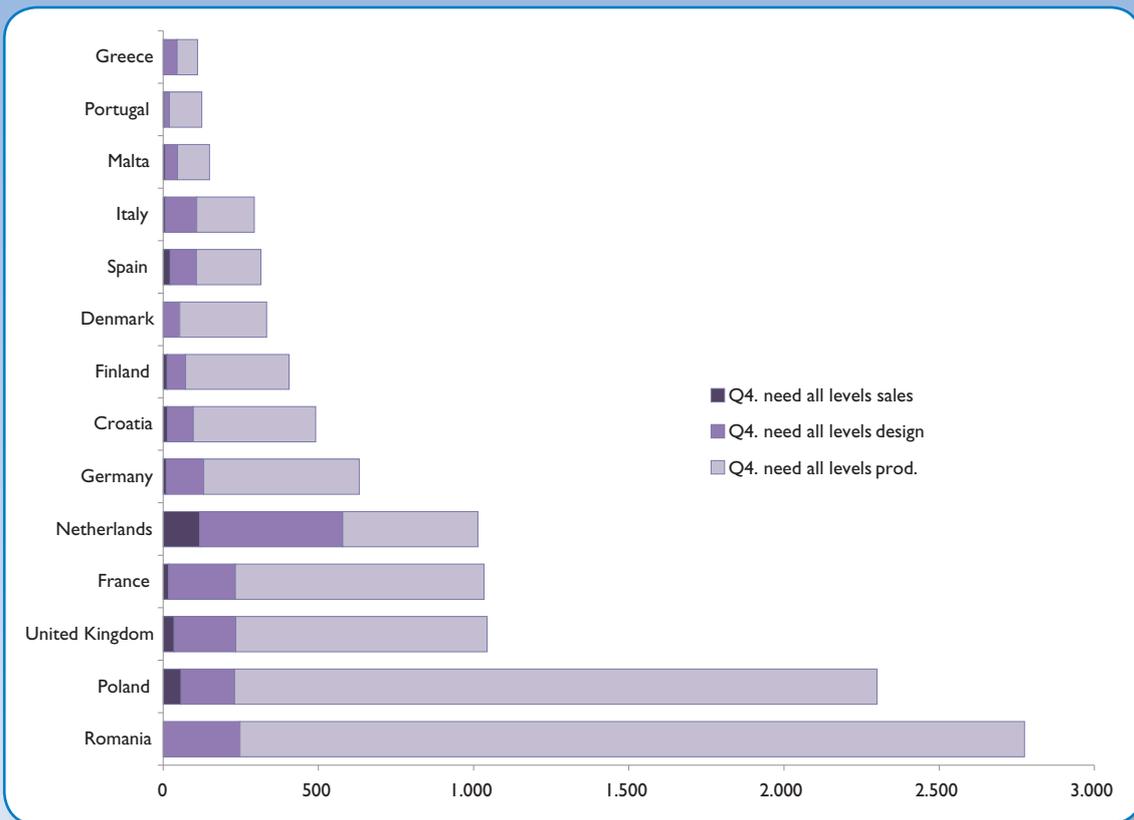


Figure 12: EU-14 shipbuilding expected annual need for technical personnel.

The annual need for technical shipbuilding personnel at all education levels as presented in Fig. 12 is also divided into the previously defined function groups:

- sales and after sales : 3% of the shipbuilding need
- design and engineering and : 17% of the shipbuilding need
- work preparation and production : 80% of the shipbuilding need

The current distribution of the function groups in the European shipbuilding industry is as follows (see also Fig. 9):

- sales and after sales : 2% of the present technical workforce
- design and engineering and : 12% of the present technical workforce
- work preparation and production : 86% of the present technical workforce

The annual need for technical shipbuilding personnel at all levels as presented in Fig. 12 can also be divided by education level:

- MSc/BSc level : 25% of the shipbuilding need
- Vocational level : 74% of the shipbuilding need
- Basic level : <1% of the shipbuilding need

The current distribution of the education levels in the European shipbuilding industry is as follows (see also Fig. 7):

- MSc/BSc level : 19% of the present technical workforce
- Vocational level : 66% of the present technical workforce
- Basic level : 15% of the present technical workforce

Apparently, in the next five years, the EU-14 shipbuilding industry as a whole will put more emphasis on sales and design at the expense of production activities. This corresponds with the general trend in the European shipbuilding industry with regard to subcontracting production activities. Also, the need for personnel at MSc/BSc level and vocational level is further increasing in the next five years. This confirms the trend of more high skilled employees in the shipbuilding industry, especially in sales and design activities.

In the next paragraphs, we will look at the national figures in more detail with regard to the relative annual need for technical shipbuilding personnel at different education levels and for different function groups.

7.1 Annual need for technical shipbuilding personnel at all levels.

The annual need for technical shipbuilding personnel is represented as a percentage of the present number of technical employees working at certain education level or in a certain function group. Representing the figures in this way gives insight into the growth rates of certain education levels or function groups per country.

Fig. 13 indicates that the overall EU-14 shipbuilding need for technical personnel at all levels is 11%. More specifically, the four countries with the highest annual need for technical shipbuilding employees (i.e. Romania, Poland, United Kingdom, and The Netherlands) are responsible for 65% of the total need for technical personnel in shipbuilding.

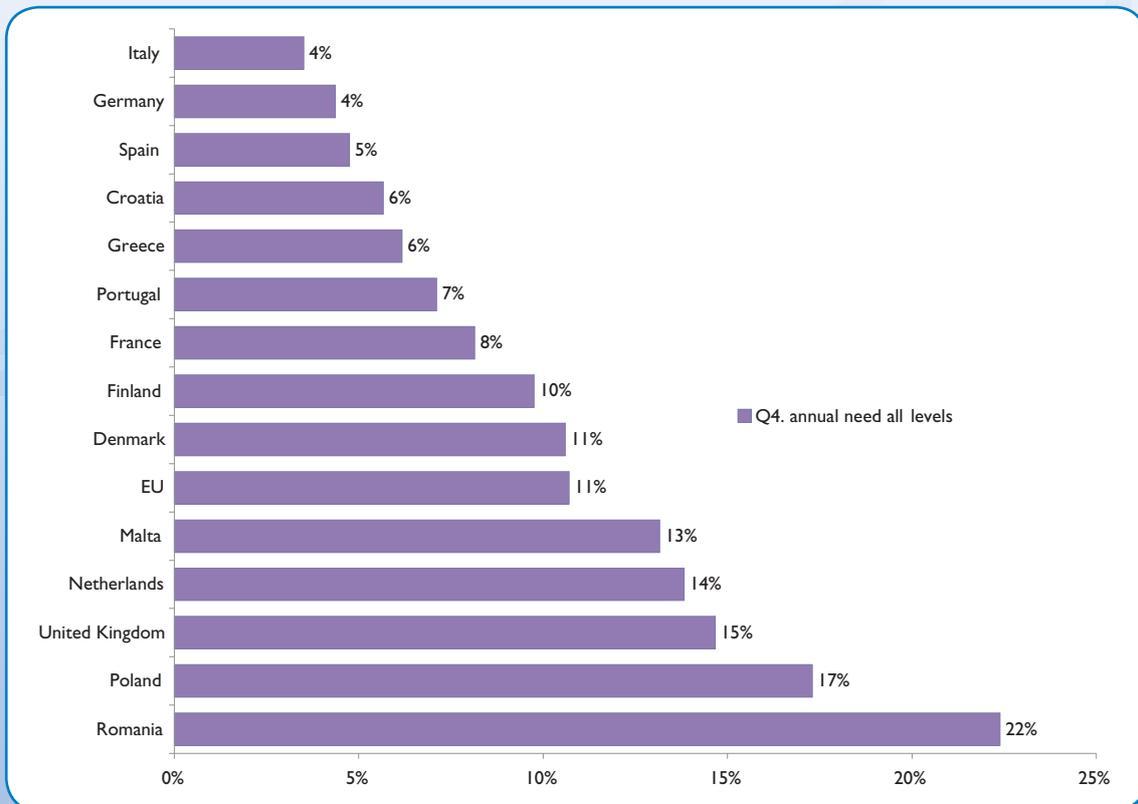


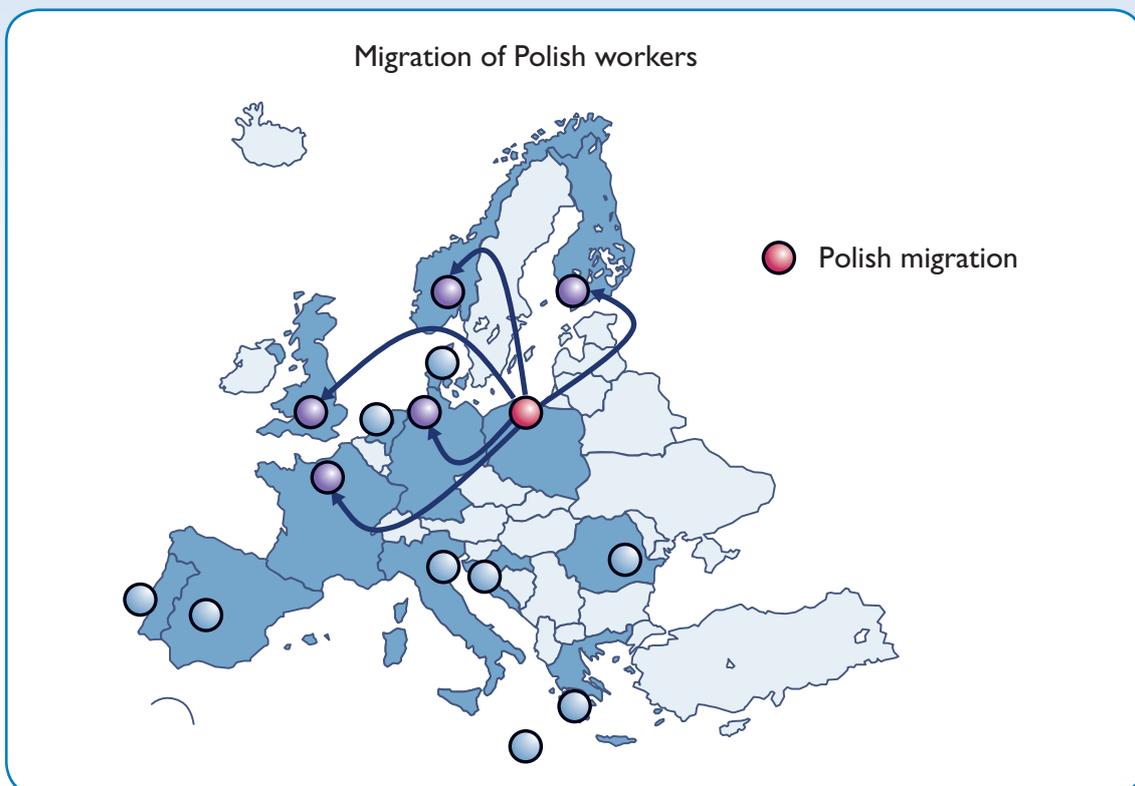
Figure 13: Annual need for technical shipbuilding personnel at all education levels.

The high annual need for Romania and Poland is caused by the huge demographic shift of labour force working in other countries over the last years. A possible explanation for the larger need for technical personnel in the United Kingdom and The Netherlands is the relatively old workforce in these countries (see Fig. 5). Another factor which plays a role is that both, the shipbuilding industry in the United Kingdom and The Netherlands, have a large share of so-called “other services” which also require shipbuilding skills (see figure 1), such as mechanical and electrical engineering. Nevertheless, next to Romania and Poland shipbuilding in the United Kingdom and The Netherlands still has a relative high need for personnel at all levels.

Malta is also investing above average into shipbuilding personnel at all levels. Although some doubts have been expressed about the future of the Maltese shipbuilding industry, this might indicate a willingness to invest in the future of shipbuilding in Malta.

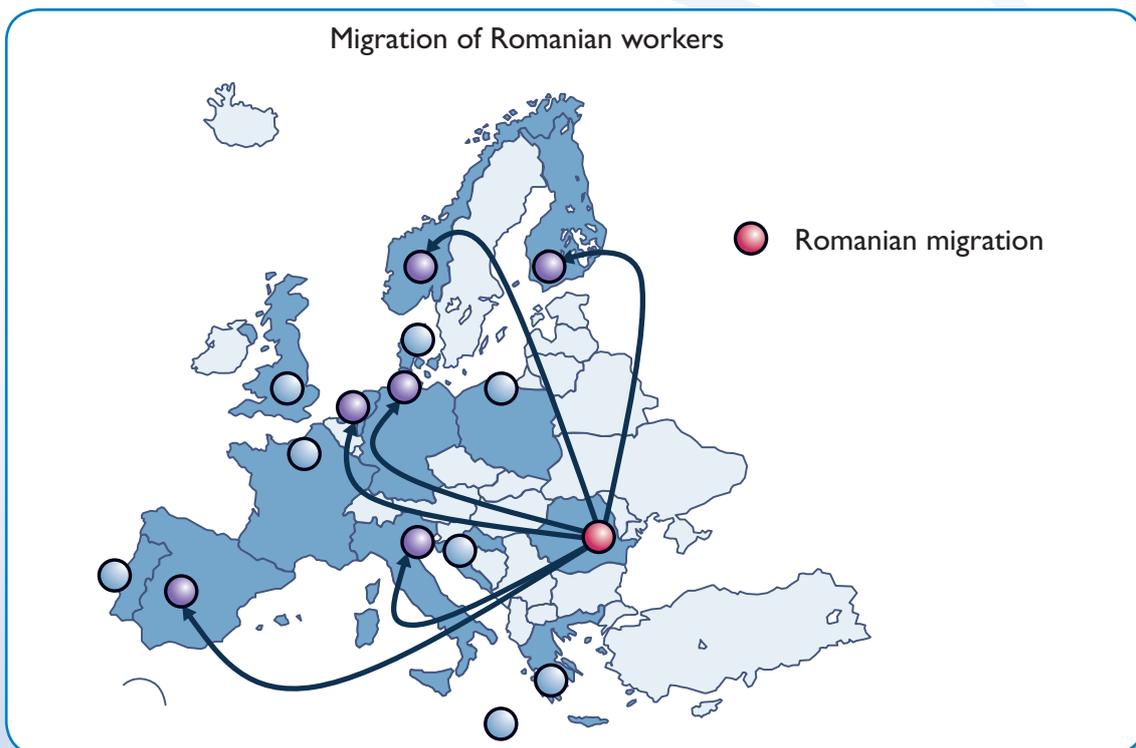
“The Polish shipbuilding industry association Forum Okretowe estimates that 5,000 Polish people are working in the Norwegian maritime industries. About 30% of these people are working in Norwegian shipyards as shipbuilders, welders or pipefitters. Many Polish shipbuilders are also employed in Germany, the United Kingdom, Ireland, France and Finland.” (Source: Interview Forum Okretowe March 2008)

“The Association of Finnish Marine Industries is a strong supporter of harmonization of the educational and training system at all levels in Europe. There should be a harmonization of skills and also common language training for skilled workers in Europe. Furthermore, an overview should be provided of what shipbuilding education is available in Europe and at what level, leading to several certificates and/or degrees.” (Source: Interview AFMI April 2008)



“The Romanian shipbuilding industry association Anconav confirmed that, over the last three years, the Romanian shipbuilders have faced a huge migration of their workers to Europe and the United States of America. This applies especially for workers in the age group of 30 to 45 years. It is estimated that

about 2,000-2,500 Romanian workers with piping, electrical and carpentry skills receive a working visa for nine months to work in the USA every year. After nine months, they return to Romania for a period of three months, and in the following year, the whole procedure starts all over again. Since the European borders are now open to Romanian workers, many skilled workers have moved to work in Norway, Finland, Italy, Spain, Germany and The Netherlands. It is estimated that 1,500-2,000 skilled workers from the Romanian shipbuilding industry are presently working in another country in Europe. This does not only apply to people working in production, but also to designers and engineers.” (Source: Interview ANCONAV March 2008)



“The Croatian Shipbuilding Corporation is also facing the migration of production workers to Italy and Germany. Lately, young and highly educated migrate to China and Korea as members of different expert teams. Retraining people is a constant process including training of school dropouts for certain trades like welders. Pipefitters should at least have had training in the steel trades. However, the drain of higher educated employees is the biggest problem. Scholarships are introduced with a study time of 5 years and a fixed contract for 10 years.” (Source: Interview CSC March 2008)

7.2 Annual need for technical shipbuilding personnel at vocational level

The annual need for technical personnel at vocational level as represented in Fig. 14 differs only slightly with Fig. 13, since the number of technical employees in shipbuilding with a vocational training is dominant amounting to 65%. Next to Poland, Romania, the United Kingdom and The Netherlands, also Denmark has an above average need for technical personnel with a vocational training. This can partly be explained by the relatively old workforce in Denmark.

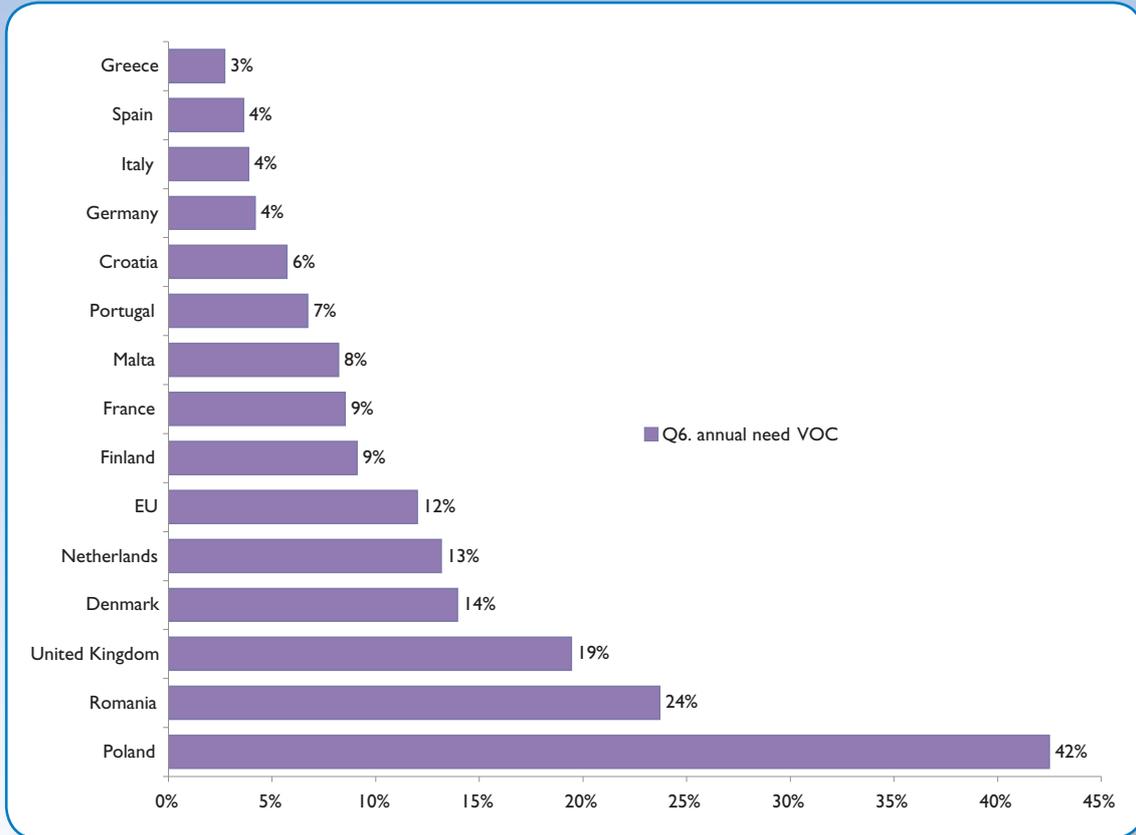


Figure 14: Annual need for technical shipbuilding personnel at vocational level

The focus on design and engineering at vocational level is clear for Denmark and The Netherlands and to a lesser extent for Romania which also focuses on work preparation and production at vocational level. Poland and United Kingdom primarily focus on work preparation and production at vocational level. It is noted that Greece, Spain, Italy and Germany have a relatively low need for people at vocational level ($\leq 4\%$) that corresponds to the replacement requirements and is not aiming at an increase of the workforce.

“The French shipbuilding industry focuses on the recruitment of personnel able to reach qualification at vocational level. Resources of interested persons for vocational education are rather low. The national education system delivers low quantities of youngsters with the right starting qualifications. Shipyards have to work hard on these starting qualifications and have to solve this national problem themselves. The competences of youngsters with starting qualifications, decreased over the years and at the same time the number of youngsters, interested in technical professions at vocational level, has decreased.”
(Source: Interview CSCN April 2008)

7.3 Annual need for technical shipbuilding personnel at MSc/BSc level

The annual need for Masters of Science and Bachelors of Science for the EU-14 shipbuilding industry shown in Fig. 15 amounts to 15%. Taking the other needs for technical education into account - all levels 11% and vocational training 12% - the future need for highly qualified people is prominent. As a result, the future need for technical workers with only basic training has fallen below 1%. This clearly confirms the European trend in shipbuilding only to work with technical employees that have received proper education and training.

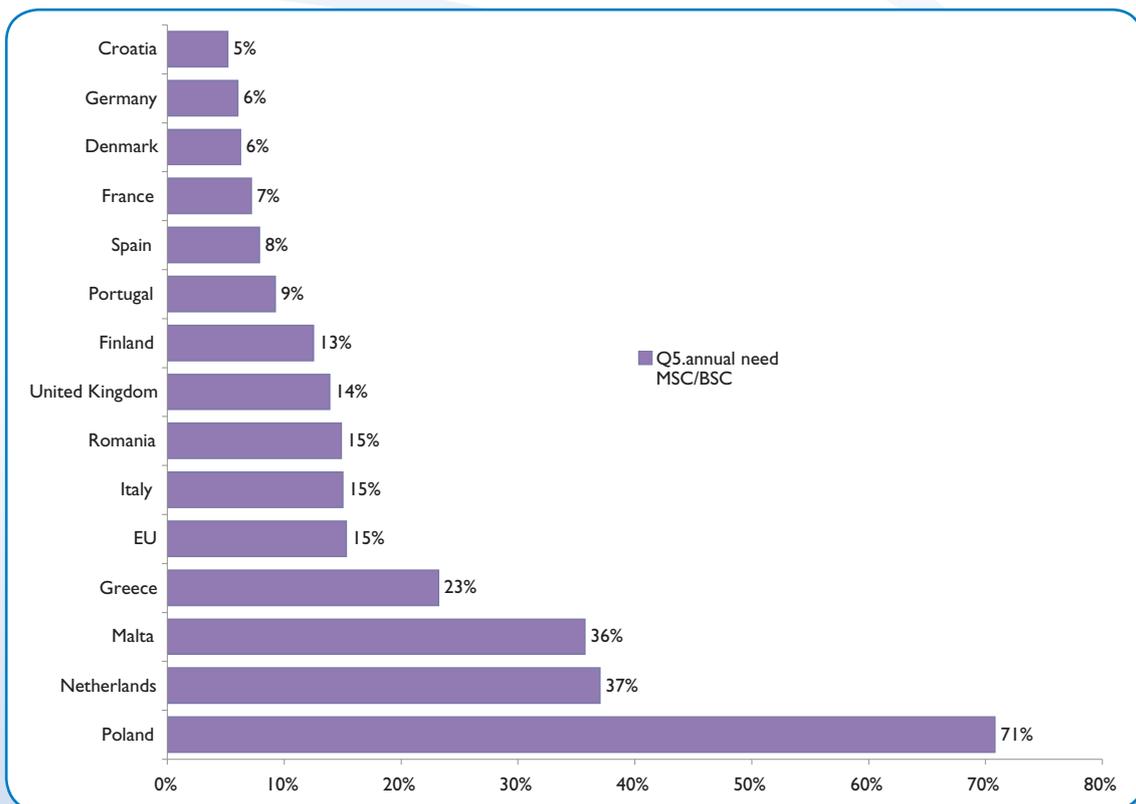


Figure 15: Annual need for technical shipbuilding personnel at MSc/BSc level

Figure 15 indicates that Poland, The Netherlands, Malta and Greece have a large need for people with an MSc/BSc degree. Especially Poland shows very high rates of need for Masters and Bachelors of Science in shipbuilding. Presently, 75% of the Polish people with a Master's or Bachelor's degree in shipbuilding are working in design and engineering activities, and only 18% is employed in work preparation and production (See also Fig. 11).

The Polish shipbuilding industry association expressed a strong growth of specialised shipbuilding design and engineering companies in Poland. The Polish shipbuilding industry, therefore, foresees a future with many opportunities for employees at MSc/BSc level in design and engineering.

The need for people at MSc/BSc level in The Netherlands, Malta and Greece is also quite high. At present, Malta has the lowest percentage of people at MSc/BSc level in Europe (4%), while Greece has an almost average percentage (17%) (see also Fig. 7). However, both Greece and Malta have a relatively low percentage of employees working in design and engineering (see also Fig. 9). Apparently, Greece and Malta will have to catch up with the rest of Europe in terms of shipbuilding design and engineering activities.

The Netherlands also has an average percentage of personnel at MSc/BSc level employed (19%) (see also Fig. 7). However, currently only 55% of the employees with an MSc/BSc degree in Dutch shipbuilding are active in design and engineering. Although this is still well above the European average (43%), it is significantly lower than, for instance, in the German shipbuilding industry (72%) (see Fig. 11), which is often considered a benchmark.

The current demand for specialised shipbuilding activities like offshore, dredging, yachting, as well as a focus on single ships or small series creates a large need for highly educated technical people in design and engineering in The Netherlands.

7.4 Annual need for technical personnel in sales and after sales

Fig. 16 shows the EU-14 shipbuilding industry annual need for sales and after sales personnel at all levels of education as compared to the present number of employees working in sales and after sales at all levels of education.

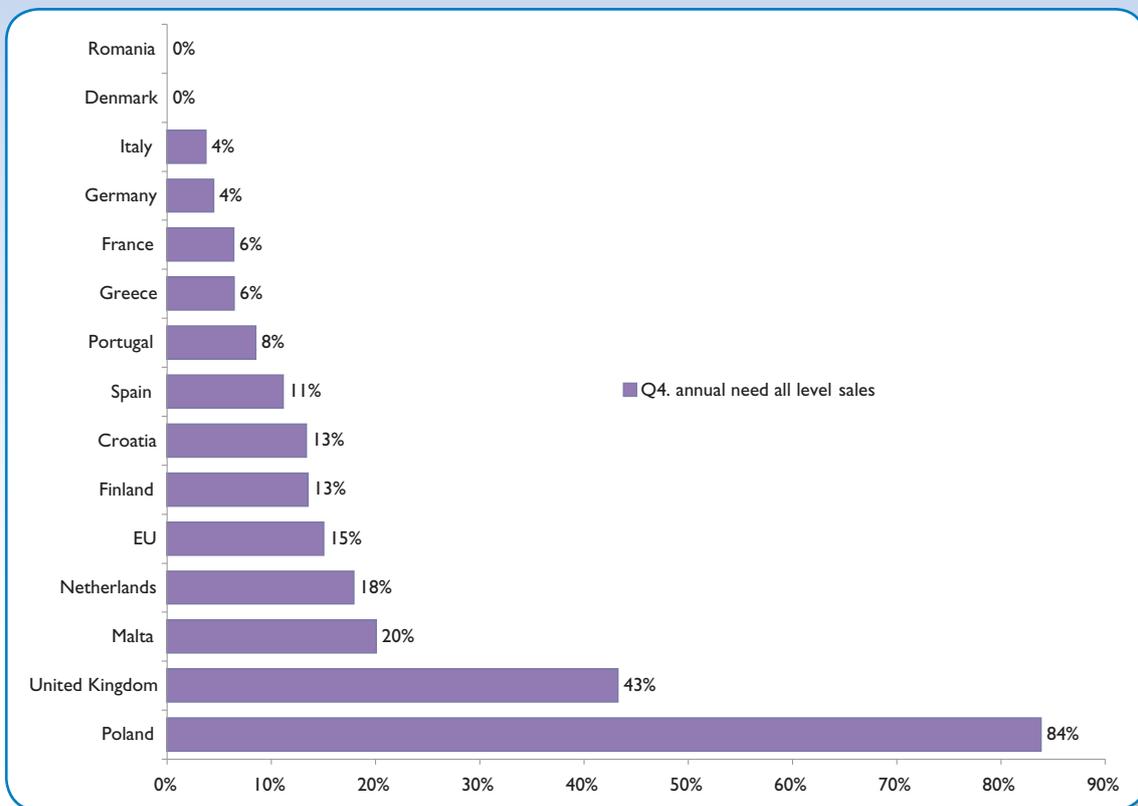


Figure 16: Annual need for technical shipbuilding personnel in sales and after sales at all levels

The overall annual need for EU-14 shipbuilding technical personnel at all levels amounts to 11% (see also Fig. 13). The overall annual need for EU-14 shipbuilding personnel in sales and after sales activities at all levels is 15%. As already stated there is a relatively high emphasis on sales and after sales activities in the years to come.

The need for sales and after sales employees is very high for Poland (84%) and also for the United Kingdom (42%). Malta and The Netherlands also have an above average annual need for sales and after sales personnel.

The very high figure for Poland can be explained by the fact that, at the moment, only 0.6% of all technical employees in Poland are active in sales and after sales (see Fig. 9). In the United Kingdom, too, only 1.1% of the technical staff is employed in sales and after sales. This is rather low compared to the EU-14 shipbuilding average of 2%. This could explain the high figures for Poland and United Kingdom.

Another reason for the above average need for sales and after sales personnel in The Netherlands, Malta, the United Kingdom, and Poland is the high rate of repair and maintenance activities (see also Fig. 1). Shipyards for repair and maintenance usually have more people working in sales and after sales activities. Although France also has a large workforce active in repair and maintenance, this primarily concerns national defence activities. This explains why France has a much lower figure (6%).

7.5 Annual need for technical personnel in design and engineering

The EU-14 shipbuilding annual need for technical employees in design and engineering at all levels is 15%. Again, this indicates that in the coming years the EU-14 shipbuilding industry will focus on design and engineering. There are seven countries with an above average need for personnel: i.e. Malta, Greece, Denmark, The Netherlands, Romania, Poland and Finland. For six countries, this can be explained by the fact that, at present, only a small percentage of their technical workforce (< 10%) is active in design and engineering (see also Fig. 9). The Netherlands, on the other hand, already has 20% of its workforce active in design and engineering but still expresses an annual need of 33% for its design workforce.

“The Dutch shipbuilding industry states that, at present, high skilled employees are widely needed. Unfortunately, the training of highly skilled workers takes at least four to five years. The need for employees in the production segment is regarded as mainly a short-term problem, although for specialised sectors like the yacht building industry, repair and naval shipbuilding, the need for production workers poses not only a short-term, but also a medium-term problem. The most critical factor, however, for the Dutch shipbuilding industry is found in the area of design and engineering.” (Source: Interview VNSI March 2008)

The above statement is reflected in Fig. 17.

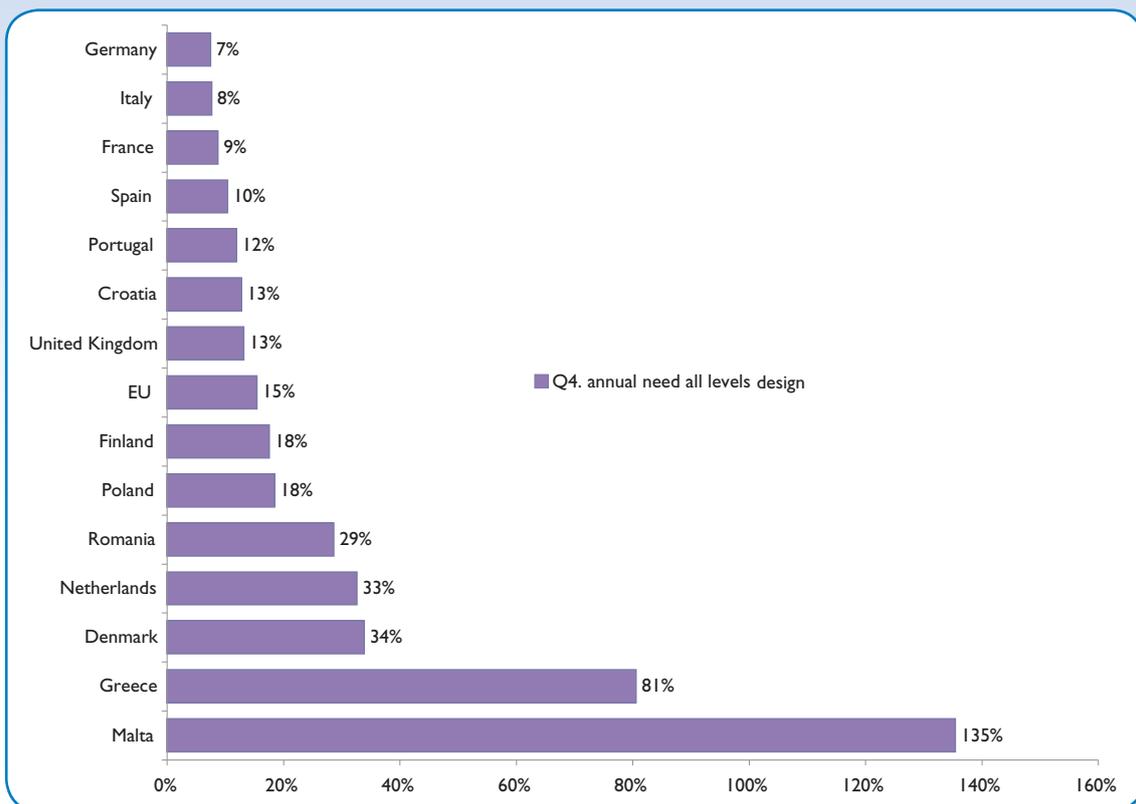


Figure 17: Annual need for technical personnel in design and engineering at all levels.

7.6 Annual need for technical personnel in work preparation and production

The EU-14 shipbuilding industry annual need for technical personnel in work preparation and production at all education levels shown in Fig. 18 amounts to 10%. This is below the overall annual need for the EU-14 shipbuilding technical personnel at all levels amounting to 11% (see also Fig. 13).

Instead of focussing on the high need rates, the countries showing a continuous low rate of annual need are evaluated, i.e. Germany and Italy. Measured by order book in CGT, Germany and Italy are the largest shipbuilding countries in Europe. Nevertheless, both countries presented very moderate annual needs.

“The German shipbuilding association VSM confirms that the German shipbuilding industry has no offensive strategy or plans to extend their production capacity in Germany. The prime HR focus of the shipyards is the replacement of people and structural development. Subcontracting in Germany is not limited to ship equipment, but also applies to ship design. The relatively low annual need for employees at shipyards with a Master and Bachelor of Science degree (6%) compared to the EU-14 shipbuilding industry (15%) can therefore be explained by the high level of co-operation between yards, equipment manufacturers and engineering subcontractors. The annual need for MSc/BSc in shipbuilding for the entire marine industry in Germany represented by VSM is about 700 people, while the annual need at the shipyards is about 150 people. Many tertiary educated shipbuilders work at specialised design and engineering companies or classification societies.” (Source: Interview VSM April 2008)

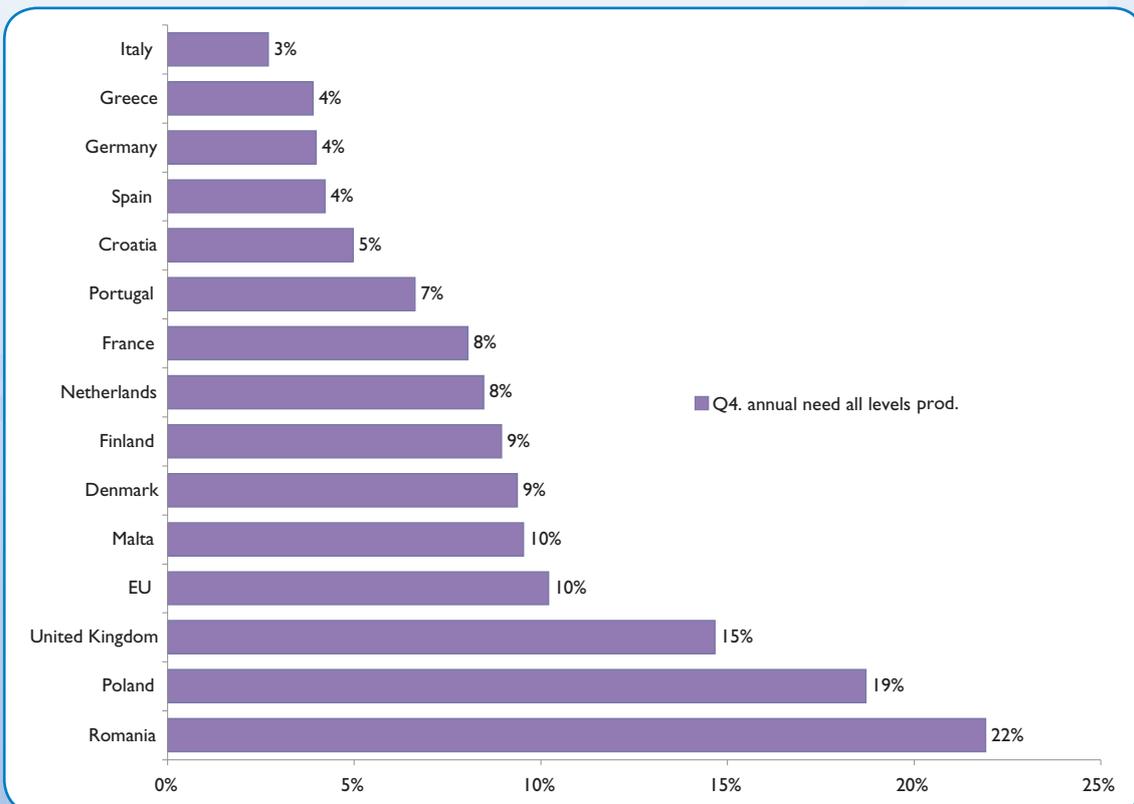


Figure 18: Annual need for technical personnel in work preparation and production at all levels

“The Italian shipbuilding association Assonave explicitly expressed that the number of people working in the shipbuilding industry is expected to remain stable over the next five years. The Italian shipbuilders foresee neither growth nor decline in personnel. The only need for technical personnel is due to retirement and natural migration. Over the years, the Italian shipbuilding industry has increased its level of subcontracting up to 70%. This also gives more flexibility to the shipyards with regard to personnel. Croatia is Italy’s major partner for the subcontracting of shipbuilding activities.” (Source: Interview ASSONAVE April 2008)

7.7 Distribution of annual need per function group at vocational level

Since the need for unskilled labour in shipbuilding is reduced to practically zero and unskilled jobs are gradually phasing out, no distribution of future functions for all levels of education is given, but only the future distribution of functions at vocational level and MSc/BSc level. These graphs will present a picture of the distribution of needs for certain functions in the next five years.

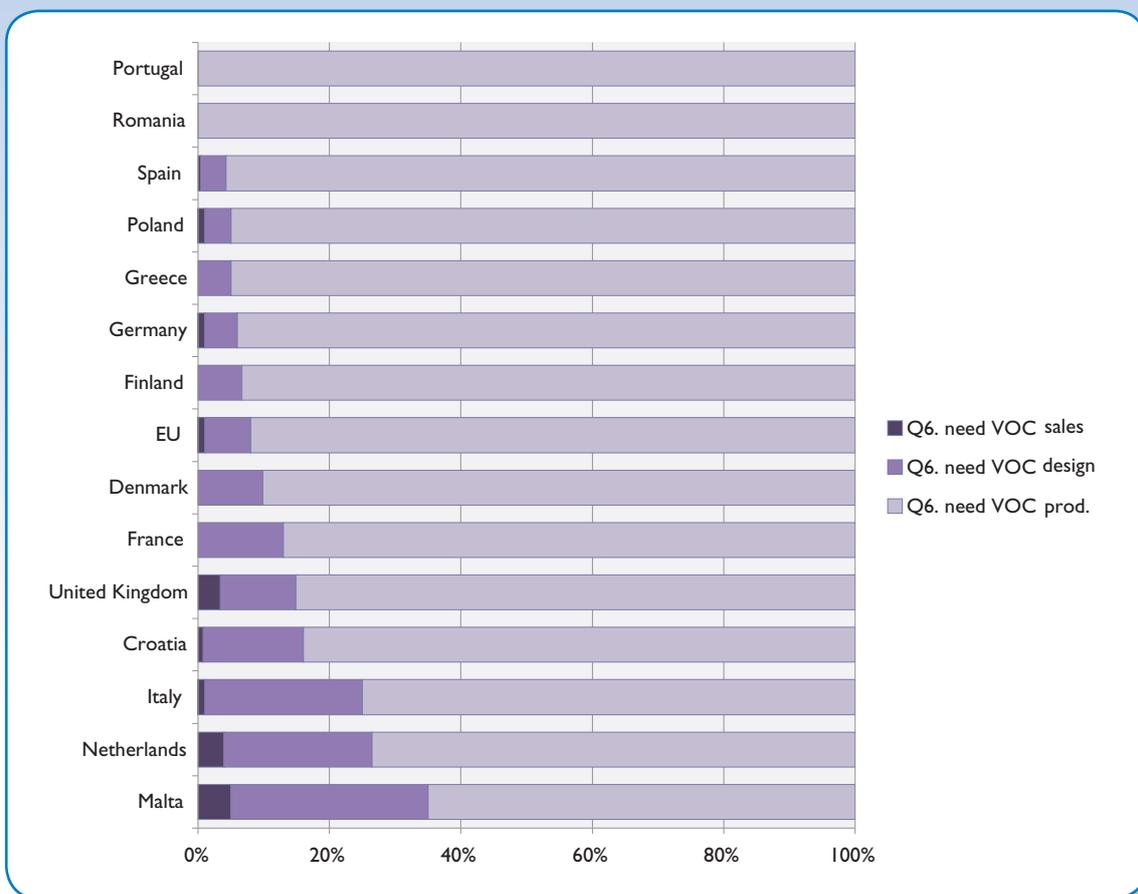


Figure 19: Distribution of annual need per function group at vocational level.

Fig. 19 displays the distribution of different function groups at vocational level. The EU-14 shipbuilding industry average shows that 92% of the need at vocational level is found in the area of work preparation and production, 7% in design and engineering and only 1% in sales and after sales functions.

Comparing these results with the current distribution of technical functions at vocational level in Fig. 10, the current EU-14 shipbuilding industry amounts to 91% in production, 8% in design and 1% in sales. This means that, at European level, the trend towards more sales and after sales as well as design and engineering is caused by the changes in annual needs at MSc/BSc level.

7.8 Distribution of annual need per function group at MSc/BSc level

The distribution of annual need per function group at MSc/BSc level is totally different from the one at vocational level and varies greatly per country. The EU-14 shipbuilding industry average shows that 44% of the need at MSc/BSc level is to be found in the area of work preparation and production, 49% in design and engineering and 7% in sales.

Comparing these results with the current distribution of technical functions for HRSTC in Fig. 11, the current EU-14 shipbuilding industry average amounts to 49% in production, 43% in design and 8% in sales. This means that at MSc/BSc level the need for sales and design increases at the expense of production. Fig. 20 shows that on national level the differences can be considerably larger.

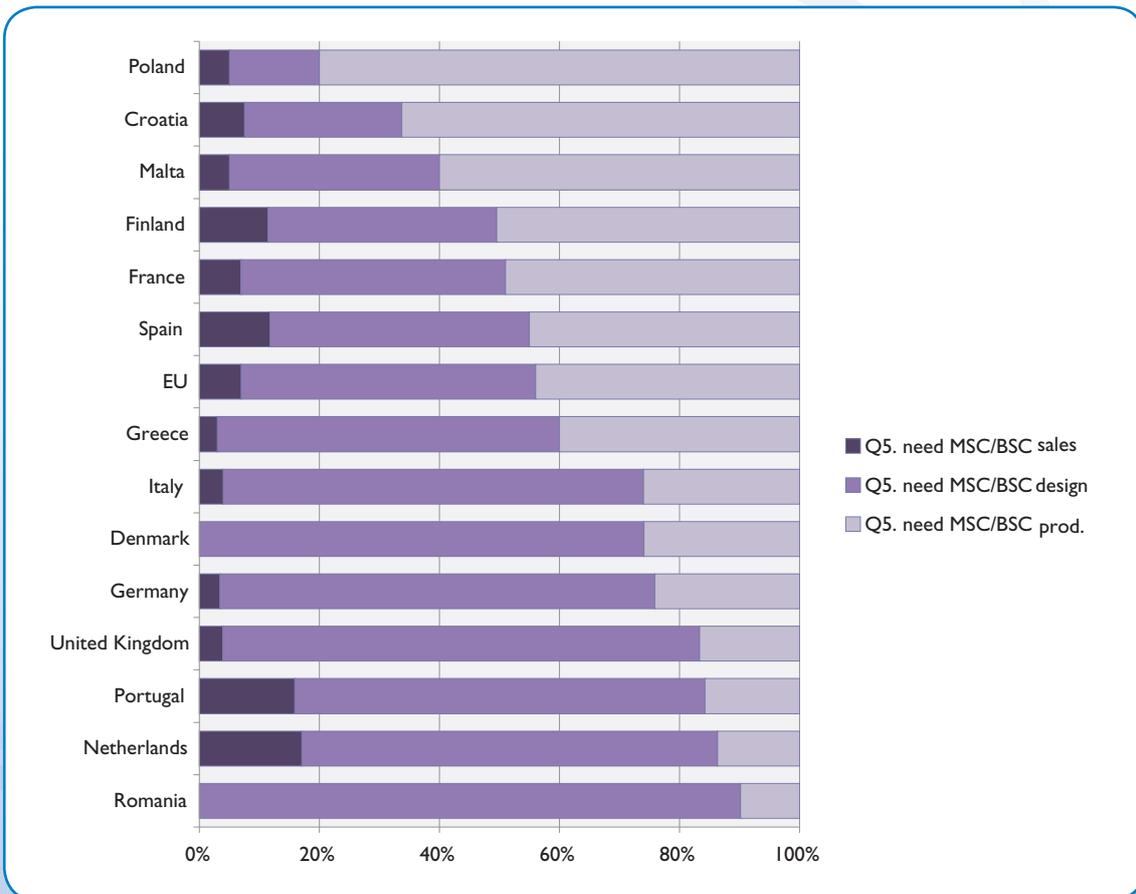


Figure 20: Distribution of annual need per function group at MSc/BSc level.

7.9 Budgets for education and training

In order to gain insight in the shipbuilding budgets for education and training, shipyards were asked to give an estimation of the annual budget for education and training. This appeared to be more difficult than expected since national funding policies for vocational training differ greatly and questions were raised on what should be included in this budget. The total EU-14 shipbuilding industry budget is estimated at 80 million for about 100,000 technical employees. This results in an annual budget per person of 800 Euro.

However, there was a large range of available budget per person, varying between 200 Euro per person for developing countries and 2,000 Euro per person for countries with a high component of naval shipbuilding activities. Unfortunately, the presented data turned out to be too inaccurate to present figures at a national level or draw conclusions at a national level. Nevertheless, these figures provide an estimate of the budget for education and training in the EU-14 shipbuilding industry as well as an estimate of the available budget per person.

Fig. 21 gives an overview of the distribution of the education and training budget over the different function groups and Fig. 22 presents an average budget per person in each of these function groups.

Although the total budget for work preparation and production is by far the largest, followed by design and engineering, the budget reservations per person are the highest for people working in sales and after sales functions.

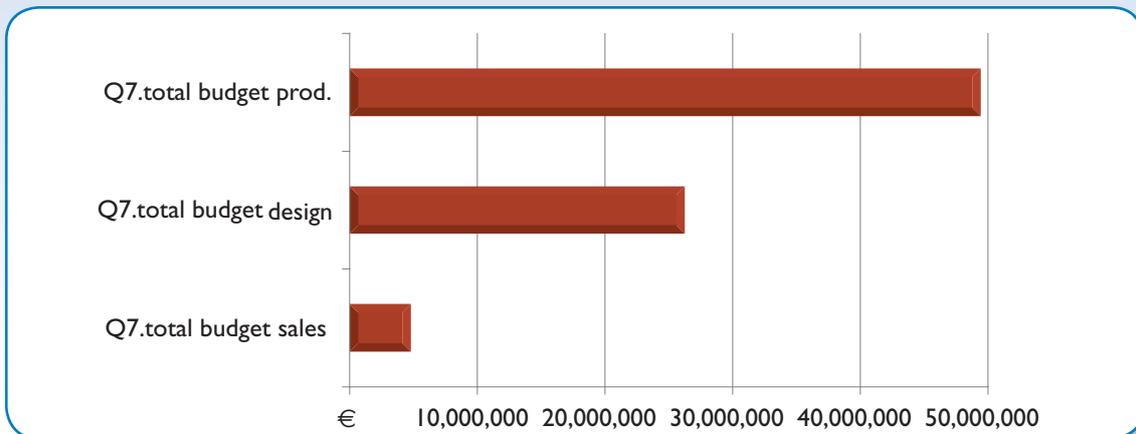


Figure 21: Estimated annual budgets for EU-14 shipbuilding industry education and training

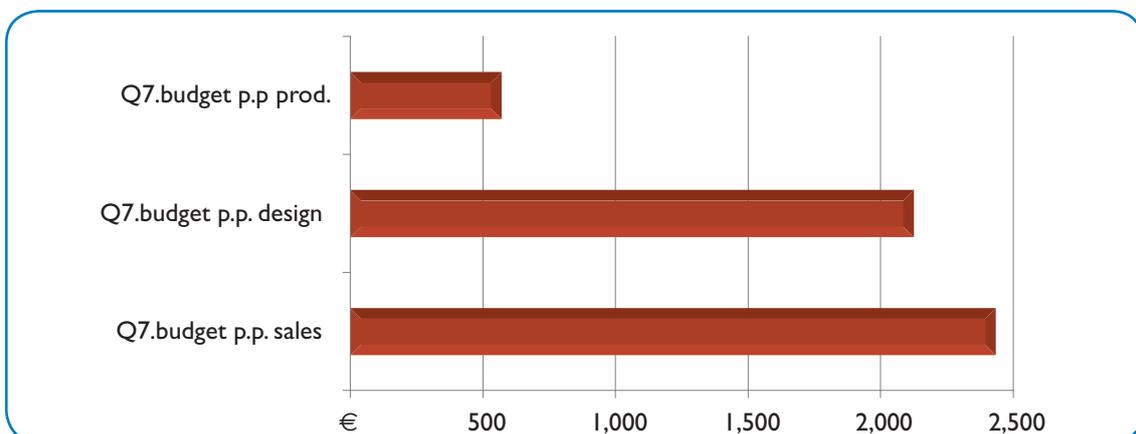


Figure 22: Estimated education and training budget per person per function group

8. Conclusions and recommendations

8.1 Conclusions from HR statistics

The following conclusions can be drawn from the HR statistics received on the basis of the questionnaires which were sent out to the national shipbuilding associations.

1. Size and demographics of the EU-14 shipbuilding industry

The European shipyards employ 127,500 people. About 103,000 people are defined as technical employees (81%). The demographic situation with regard to age profiles is for the EU-14 shipbuilding industry comparable to Europe as a whole. On national level, there are quite some deviations from the European average.

2. EU-14 shipbuilding industry employs high-tech personnel

The EU-14 shipbuilding industry has more technical people employed holding an MSc/BSc degree (19%) than the European average workforce (15%). This confirms the high-tech profile of the EU shipbuilding industry.

3. EU-14 shipbuilding industry employs a highly educated and trained workforce

The EU-14 shipbuilding industry employs a high percentage of skilled technical personnel at MSc/BSc level or vocational level (85%). Workers with only basic education are gradually disappearing, since there is no need for unskilled labour in the EU-14 shipbuilding industry.

4. Ageing of shipbuilding personnel is a moderate problem

Based on the age profiles of technical workforce in the EU-14 shipbuilding industry approximately 1% will retire on an annual basis over the next 10 to 15 years. For countries with a relatively old workforce, this figure will amount to max. 2%.

5. Production is still the prime focus of the EU-14 shipbuilding industry

At present, the total technical workforce in the EU-14 shipbuilding industry is distributed into the following functions groups: 2% in sales and after sales, 12% in design and engineering and 86% in work preparation and production. On national level there are considerable deviations from this distribution.

6. EU-14 shipbuilding industry has a large annual need for technical employees

The need for technical employees in the EU-14 shipbuilding industry over the next 5 years amounts to about 11,000 people per year. This is 11% of the present EU-14 shipbuilding technical workforce. Retirements taken into account (minus 1%), the EU-14 shipbuilding workforce has to grow by 10% per year in the next five years. Considering an average migration of technical employees between shipyards of about 4%, the EU-14 shipbuilding technical workforce still has to grow by 6% per year.

7. EU-14 shipbuilding industry has a large need for employees at MSc/BSc level

The EU-14 shipbuilding technical workforce has a high need for technical employees at MSc/BSc level (15%), an average need for technical employees at vocational level (12%) and no need for unskilled labour (<1%).

8. EU-14 shipbuilding industry is shifting towards more sales and design activities

The future need for the total technical workforce in the EU-14 shipbuilding industry is distributed into the following function groups: 3% in sales and after sales, 17% in design and engineering and 80% in work preparation and production. This indicates a stronger focus on sales and after sales and on design and engineering at the expense of work preparation and production.

9. EU-14 shipbuilding education and training budgets are primarily reserved for production

Only general remarks are made on budgets for education and training, since there is a large variety in education systems and funding and only limited data were available. The EU-14 shipbuilding education and training budget is estimated at 80 million Euro per year and is distributed as follows: work preparation and production (61%), design and engineering (33%) and sales and after sales (6%). The average budget per person is 800 Euro, but varies greatly per country.

8.2 Conclusions and recommendations from statistics and HR interviews

Based on the statistics and HR interviews there are four major areas where European trends, responses and actions are to be defined:

1. OUTSOURCING

Trend

Most European shipbuilding countries do not invest in extension of production capacity, but focus on outsourcing. Several countries have mentioned the outsourcing of design and engineering capacities, other countries are focusing on outsourcing of steelwork like modules, sections, and even entire hulls. Forum Okretowe stressed that Polish state-owned yards are available for the outsourcing of extra steelwork of European shipbuilders, but must first await a decision of the European Commission with regard to their state aid case.

Response

Many European countries are using skilled labourers from Poland and Romania to fill up their production gaps. Sometimes, these people have a temporary employment at the shipyard, but very often they are working for the shipyard via specialised subcontractors. For design and engineering activities people do not necessarily have to work at or near the shipyard. Specialised design and engineering companies are established in Poland and Romania working for shipyards throughout the whole world.

Recommended European action

European shipbuilding countries propose the development of EU legislation for (temporary) employment of skilled EU and non-EU workers in order to maintain a level playing field. Also, the European shipbuilding industry should develop principles for guaranteeing such a level playing field. The European Shipbuilding Social Dialogue Committee could be a platform to develop these principles.

2. SHIPBUILDING IMAGE

Trend

In several European countries the image of shipbuilding is improving. Image campaigns are held on European, national and company level at regular intervals. However, it is noticed that the regular education system in most countries is not able to follow the quickly rising demand in the shipbuilding industry. Although this seems logical, since the education of technical people usually takes 2 to 5 years, the general impression of many countries is that the education system is reacting too slowly.

Response

In order to further improve the image of shipbuilding and attract more employees image campaigns are not only required on a national level, but also on a local or regional level by individual companies active in the shipbuilding industry. The public opinion on shipbuilding in Europe improves and the present shipbuilding boom offers opportunities to improve the image even further. Shipbuilding companies are investing in training and education in creative ways like company scholarships, in order to attract new employees.

Recommended European action

European actions to promote the shipbuilding industry are highly valued by the European shipbuilding industry. It is regarded as an important task of the European Commission to support social partners in raising public awareness and support for vital industries like shipbuilding.

3. SHIPBUILDING EDUCATION

Trend

The larger European shipbuilding countries in particular face a shortage of MSc/BSc students in shipbuilding. Shipyards are starting to recruit students from other technical disciplines (e.g. mechanical engineering, logistics, business administration and IT). For many European shipbuilding countries, the recruitment of and requirements for vocational students remains a very important issue. In general it was concluded that starting qualifications for vocational students are too low. In several countries the national education system does not provide sufficiently qualified technical people. People need to be trained on the job first for about six months before they can be used in production activities.

Response

Several European countries provided suggestions for the lack of highly educated shipbuilders at MSc/BSc level and vocational students. An interesting development in German shipbuilding is the development of a dual system of studies combining a vocational education with a Bachelor's degree for applied sciences. In four to five years time the students, employed by the shipyards, follow their course of studies with practical training phases on the shipyards. As a result, they can obtain a double qualification as skilled worker and Bachelor of Science. In other countries, permanent education and continuing learning lines or a wider education field like Maritime Technology are promoted. Some shipbuilding countries have also good experiences with European student and / or knowledge exchange programs.

Recommended European action

Europe should facilitate the development of a European maritime design academy and a European vocational education system and training program, including harmonization of educational and training systems at all levels. Several shipbuilding countries demand a more pro-active approach towards life long learning. In this respect, work pools are mentioned as well as tax benefits for shipyards involved in education on the job.

A huge work-force potential lying idle are women. So far, this potential has been highly neglected and forgotten for too long and should not only be activated but also directly supported and attracted to work in technical professions in general and shipbuilding in particular.

4. MIGRATION OF SKILLED WORKERS**Trend**

Several countries are facing personnel problems due to the (temporary) migration of skilled workers. Romania observes a migration of production and office employees to European shipbuilding countries and the United States. Poland observes a migration of production workers to European shipbuilding countries. Croatia observes a migration of production and office workers to Italy and a migration of office workers to Korea, China and Japan.

Response

Polish, Romanian and Croatian shipbuilders can offer a solution to the lack of skilled labour in the European shipbuilding industry. Since the vocational training in these countries is not tailor-made for the shipbuilding industry, shipyards spend considerable time and money to train graduates of vocational schools the proper shipbuilding skills. The development of training centres for vocational training should be high on the European shipbuilding priority list.

Recommended European action

Financial support for the development of shipbuilding training centres is presently neither given by national governments nor the European Commission. In this vacuum Europe should support young people with a solid vocational training to become skilled workers. It is estimated that the development of shipbuilding training centres in Eastern Europe will cost about 600.000 Euro per training centre per year.

Annex 1: HR Research Study Working Group

Name	Organisation
Mr. Henk van Beers	EMF
Mr. Pieter 't Hart	Koers & Vaart
Mrs. Andrea Husen	EMF
Mr. Marco Kirsenstein	CESA
Mr. Reinhard Lüken	CESA
Mr. Ruud Schouten	CESA
Mr. Fabrice Theobald	CESA
Mrs. Heike Thomsen	CESA
Mr. Andreas Veres	EMF

Annex 2: Glossary of terms & questionnaire

Glossary of terms of major professions in the shipbuilding & ship repair industry

TECHNICAL PROFESSIONS						
Education system	Average age of starting education	Degree	LEVEL	Technical sales /after sales	Design/engineering	Work preparation / production
University or College	18+	University (Msc) or College (Bsc) Degree	High	<ul style="list-style-type: none"> - sales department managers - technical sales managers - proposal engineers - estimators - after sales managers - account managers - customer relation managers 	<ul style="list-style-type: none"> - design department managers - engineering department managers - design managers - engineering managers - naval architects - designers - structural engineers - lead engineers 	<ul style="list-style-type: none"> - work preparation department managers - production department managers - work preparation managers - production manager - general planners / logistic managers - project managers - production coordinators - repair / maintenance managers - dockmasters - HSE managers
Vocational technical training	16+	Vocational Certificate (below Bsc)	Medium	<ul style="list-style-type: none"> - technical sales assistants - assistant estimators - after sales assistants - account assistants - customer relation assistants 	<ul style="list-style-type: none"> - shipbuilding engineers - mechanical engineers - electrical engineers - draughtsmen (CAD) - engineering planners 	<ul style="list-style-type: none"> - production assistants - work preparation assistants - production planner/ logistic assistants - foremen - shipwrights / master shipbuilders - master craftsmen - repair / maintenance assistants - assistant dockmasters
Basic technical training		No Vocational Certificate	Basic		<ul style="list-style-type: none"> - shipbuilding draughtsmen - mechanical draughtsmen - electrical draughtsmen 	<ul style="list-style-type: none"> - metalworkers / steel frame workers - assembling operators/steel shapers - welders - cutting mechanics - fitters / pipefitters/plumbers - electricians - carpenters - maintenance technicians - service technicians - docking assistants

**“QUESTIONNAIRE CESA / EMF HR Research Study“
Demographic Change and Skills Requirements.**

GEN.	GENERAL INFORMATION				
A.	Name of shipyard	EU-14 shipbuilding Industry			
B.	Location				
C.	Country				
D.	Total number of employees	127.587			
D.1	Number of employees for new building of ships	100.583			
D.2	Number of employees for repair / maintenance	21.730			
E.	Name contact person				
F.	E-mail contact person				
G.	Tel. no. contact person				
PR.	PRESENT SITUATION AT THE SHIPYARD	Under 25 years old	25-40 years old	41-55 years old	Over 55 yrs old
I.a	What is the number of technical employees (all levels of education) for the various age groups?	11.331	36.907	41.456	13.389
I.b	Please give an indication (in %) of this number of technical employees in the following categories:				
I.b.1	Technical sales/after sales:	63	741	839	336
I.b.2	Design/engineering:	683	4878	5036	1769
I.b.3	Work preparation/Production:	10416	30838	34584	10853
2.a	What is the total number of technical employees with a college or university degree (Bsc or Msc level).	17816			
2.b	Please give an indication (in %) of this number of technical employees in the following categories:				
2.b.1	Technical sales/after sales:	1337			
2.b.2	Design/engineering:	7311			
2.b.3	Work preparation/Production:	8450			
3.a	What is the total number of technical employees with a vocational certificate (below Bsc level).	67835			
3.b	Please give an indication (in %) of this number of technical employees in the following categories:				
3.b.1	Technical sales/after sales:	568			
3.b.2	Design/engineering:	5677			
3.b.3	Work preparation/Production:	60705			

NEED	EXPECTED AVERAGE ANNUAL NEED FOR TECHNICAL PERSONNEL OVER THE NEXT 5 YEARS (2008- 2012)	
4.a	What is the average annual need for technical employees over the next 5 years (all levels of education):	11163
4.b	Please give an indication (in %) of this number of technical employees in the following categories:	
4.b.1	Technical sales/after sales:	304
4.b.2	Design/engineering:	1899
4.b.3	Work preparation/Production:	8817
5.a	What is the average annual need for technical employees over the next 5 years with a college or university education (Bsc or Msc level)	2719
5.b	Please give an indication (in %) of this number of technical employees in the following categories:	
5.b.1	Technical sales/after sales:	204
5.b.2	Design/engineering:	1309
5.b.3	Work preparation/Production:	1176
6.a	What is the average annual need for technical employees over the next 5 years with a vocational certificate (below Bsc level).	8189
6.b	Please give an indication (in %) of this number of technical employees in the following categories:	
6.b.1	Technical sales/after sales:	79
6.b.2	Design/engineering:	583
6.b.3	Work preparation/Production:	7521
BUDG.	EXPECTED ANNUAL EDUCATION AND TRAINING BUDGET OVER THE NEXT 5 YEARS (2008- 2012)	
7.a	What is the expected average annual education and training budget for technical employees over the next 5 years (all levels of education):	80521
7.b	Please give an indication (in %) of this budget division for technical employees in the following categories:	
7.b.1	Technical sales/after sales:	6%
7.b.2	Design/engineering:	32,6%
7.b.3	Work preparation/Production:	61,4%

Annex 3: List of interviewed persons

Name	Organisation	Country
Mrs. Rajka Borcic-Mihov	Croatian Shipbuilding Cooperation	Croatia
Mrs. Jaguda Bulat	Brodosplit Shipyard	Croatia
Mr. Zoran Butic	Brodotrogir Shipyard	Croatia
Mrs. Nadja Dijan	3M Maj Shipyard	Croatia
Mrs. Ljubica Linardic	Viktor Lenac Shipyard	Croatia
Mr. Ivo Martinovic	Croatian Shipbuilding Cooperation	Croatia
Mr. Neven Pajdas	Croatian Shipbuilding Cooperation	Croatia
Mrs. Tonka Radnic	Brodosplit Shipyard	Croatia
Mr. Cvjetko Vretenar	Uljanik Shipyard	Croatia
Mrs. Jenny Braat	Danish Maritime	Denmark
Mrs. Maria Hamm	Odense Steel Shipyard	Denmark
Mr. Lars Hensen	Odense Steel Shipyard	Denmark
Mr. Jeppe Orskov	Orskov Yard	Denmark
Mr. Arto Helin	Aker Finnyards	Finland
Mr. Ari Rajamaki	Aker Finnyards	Finland
Mrs. Merja Salmi-Lindgren	Association of Finnish Maritime Industries	Finland
Mrs. Beatrice Gouriou	Aker Yards France	France
Mr. Michel Ollier	DCNS	France
Mr. Fabrice Theobald	Chambre Syndicale des Chantiers Navals	France
Mr. Heino Bade	IG Metall	Germany
Mr. Alexander Geisler	Verband für Schiffbau und Meerestechnik	Germany
Mr. Volker Karpen	Verband für Schiffbau und Meerestechnik	Germany
Mr. Joachim Kell	ThyssenKrupp Marine Systems	Germany
Mr. Erwin Kiel	Howaldtswerke-Deutsche Werft	Germany
Mr. Ralph Soeren Marquardt	Verband für Schiffbau und Meerestechnik	Germany
Mr. Livio Marchesini	ASSONAVE	Italy
Mr. Pierfrancesco Tartarelli	Fincantieri	Italy
Mr. Timo Bindels	IHC Merwede	Netherlands
Mr. Ruud van den Bergh	FNV	Netherlands
Mr. Marco Kirsenstein	Shipbuilding Netherlands	Netherlands
Mr. Charles van de Loo	Damen Shipyards	Netherlands
Mr. Nick van Putten	Heesen Yacht Builders	Netherlands
Mr. Bert van der Sluis	IHC Merwede	Netherlands
Mr. J. Teensma	Damen Shipyards	Netherlands
Mr. J. Czuczman	Forum Okretowe	Poland
Mr. Nuno Ivo de Magalhaes	AIM	Portugal
Mr. Pimentel das Neves	ENVC	Portugal
Mr. Jose Ventura de Sousa	AIM	Portugal
Mr. Florin Spataru	Damen Shipyards Galati	Romania
Mr. Gelu Stan	ANCONAV	Romania
Mr. Jose Belon Lopez	MCA-UGT	Spain
Mr. Enrique Calvet Chambon	UNINAVE	Spain
Mr. Ramon Lopez Eady	UNINAVE	Spain
Mr. Jose Luis Gacio Caeiro	MCA-UGT	Spain
Mr. Manuel Garcia Gonzalez	MCA-UGT	Spain
Mr. Javier Leguina Gogenola	ELA metal	Spain
Mr. Joseba Postigo Gonzalez	Astilleros La Naval	Spain
Mr. Jesus Querol Pascual	UNINAVE	Spain
Mr. Juan Rojo	Gerencia del Sector Naval	Spain
Mr. Pedro Lorca	CCOO	Spain
Mr. Vicente Sanchis Belmonte	Astilleros De Sevilla	Spain
Mr. Jim McHarg	BAE Systems	United Kingdom

European Metalworkers' Federation

International Trade Union House (ITUH)
Boulevard du Roi Albert II, 5 (bte 10)
B-1210 Brussels
Phone.: +32.2.227.10.10
Fax: +32.2.217.59.63
E-mail: emf@emf-fem.org
Website: www.emf-fem.org

Community of European Shipyards' Associations

Rue Marie de Bourgogne 52-54
B-1000 Brussels
Phone: +32.2.230.27.91
Fax: +32.2.230.43.32
E-mail: info@cesa.eu
Website: www.cesa.eu

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