

# MATES Consultation on skills gaps and shortages in the maritime technology industry 2020: Questionnaires, Semi-structured interviews and Focus Groups

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## 1 – Introduction

This consultation process, held between April and July 2020, was planned as a supplementary activity of the MATES' Thematic Groups to further validate and discuss with the maritime technology industry the existing insights on the reported gaps and shortages in terms of skills of the existing workforce.

The MATES project engaged industrial organisations involved in different activities of the value chain of shipbuilding and offshore renewable energy. Different types of organisations were targeted, including companies, clusters and associations; special attention has been paid to gather the views of Small and Medium-sized Enterprises (SMEs).

Furthermore, considering productivity shares and employment rates, the European countries have been prioritized so that a clearer direction is provided to this consultation process, ensuring representative results in the European context.

## 2 – Methodology

The industry consultation process was conducted via two means:

**1. An online questionnaire distributed to industrial organisations all over Europe.** After getting feedback on the profiling of their personnel, the main aim of the survey was to validate and/or gain further insights on:

- The skills review process that the companies are following (i.e. frequency)
- The main groups of occupational profiles that are being targeted by the skills review process

- The minimum requirements set by the companies, with regard to the main occupational groups, in terms of their educational and training background
- The level of difficulty experienced in finding highly-qualified personnel
- Gaps and shortages with regard to both hard and soft skills
- Appropriate methods suggested for addressing these gaps

2. The feedback from this questionnaire survey has been further elaborated through a consultation process undertaken with a **Focus Group of selected experts**, selected and invited according to the following criteria:

- Wide spread of experts' knowledge and experience in all different phases of the value chain of the two sectors targeted.
- At least 10 years of expertise in the industry sector.
- Coverage of all prioritized countries by means of their productivity levels and employment in the sector.
- Higher priority on experts who had contributed to the preparation of sectoral studies and strategies at regional or national level.

Semi-structured personal interviews were conducted with the selected experts for further elaboration and for obtaining more detailed information on the issues raised through the questionnaire survey.

- Shipbuilding [Interview<sup>1</sup>](#)
- ORE [Interview<sup>2</sup>](#)

Based on the results of this process, a smaller group of experts was invited to participate in the online focus group for each of the two sectors.

### 3 - Specific objectives and expected results for the Focus Group.

The FG consultation was held online and lasted 2 hours. It was structured around four key topics:

- A) *Complementary industry insights on current skill gaps and needs*: based on the outcomes of the questionnaire survey and the personal interviews, more detailed insights were sought for those skills gaps and needs that had received a higher priority rating. The main aim was to get a deeper understanding of those gaps and needs that would allow the project to successfully address them in the following project activities (40 minutes).
- B) *The impact of COVID-19 on skills development and prioritization*: insights were requested regarding new skills emerging or current ones receiving a higher priority (e.g. health-related) as a result of the implications of the COVID-19 crisis. (20 minutes).
- C) *Orientation of selected Pilot Experiences*: for selected Pilot Experiences an industry orientation was requested (20 minutes).
- D) Ocean Literacy (OL); how can OL contribute to a better skilled workforce? Introduction to OL and discussion about good practices and appropriate formats for introducing efficiently Ocean Literacy activities in the Shipbuilding and ORE industries (20 minutes).

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<sup>1</sup> Shipbuilding interview <http://intranet.projectmates.eu/index.php/s/mzfsG649tRCQLpW>

<sup>2</sup> ORE interview <http://intranet.projectmates.eu/index.php/s/MTqHqmJpZinpzDz>



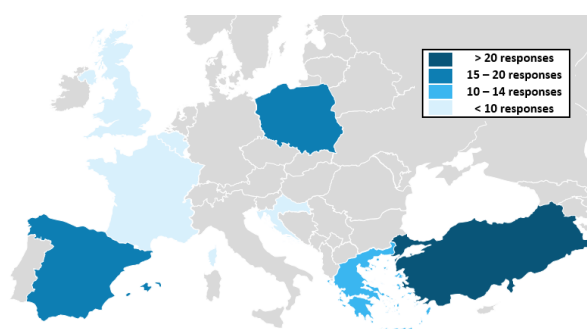


### 3– Shipbuilding sector results

#### 3.1 Shipbuilding on-line questionnaire

Preliminary results were [analysed](#)<sup>3</sup> on 12<sup>nd</sup> June 2020, and were discussed with the focus group experts during the semi-structured interviews. The questionnaire process was finalised on July 17<sup>th</sup>, obtaining the following results:

- In total, 77 companies and 1 cluster (representing 300 enterprises) from 9 different countries namely Turkey, Spain, Poland, Greece, UK, France, Belgium, Croatia, Malta participated in the survey (Figure 1).



- They represent approximately 23.300 employees (excluding subcontractors)
- 62% are active globally
- 17% are micro companies (<10 employees), 56% are SMEs (10 to 249 employees), 27% are large corporations (>250 employees)

Figure 1: Distribution of the Shipbuilding companies that participated in the questionnaire survey (Source: authors' own elaboration on data)

- Figure 2 gives an overview of the value chain activities covered by participant companies (Ship Construction and outfitting: 61.5%, Repair and maintenance: 58%, Construction & Installation: 71%, Design: 51%, Recycling: 11.5%)

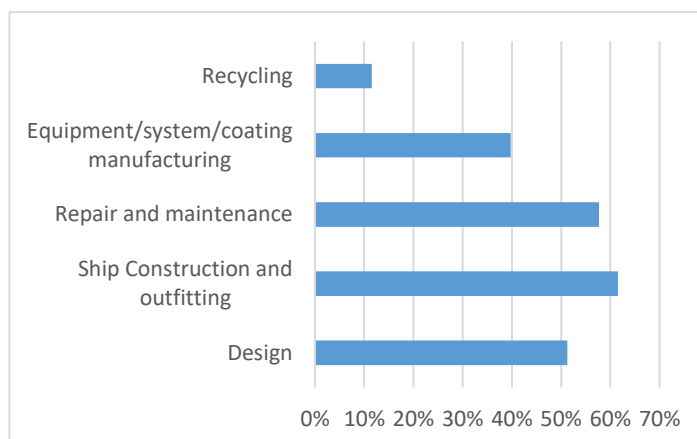


Figure 2: Shipbuilding value chain's activities covered by the participant companies (Source: authors' own elaboration on data)

- Employees younger than 30 years old , usually consisting of 10-25% of company personnel and a similar percentage applied to employees over 50 years old .
- With the exception of Polish companies, the rest reported having fewer employees in the lower age category (<30%) than in the higher one (>50%) highlighting the challenge of an aging workforce.

<sup>3</sup> Preliminary results of the shipbuilding questionnaire  
<http://intranet.projectmates.eu/index.php/s/KyfX4pwWofmJWPW>

- Half of the respondent companies (50%) review their personnel's skills on an annual basis
- Skills reviews mainly address the occupational groups of Engineers (79%), Engineering technicians (64%) and Mechanics (30%).
- Most of the participant companies face difficulties in recruiting well-qualified employees.
- The most important hard skills gaps reported are i) *Specific technical skills (torch cutting, welding, etc.)*: 79%, ii) *Project management*: 51%, iii) *Foreign languages – reading and writing (especially English)*: 44,5%, iv) *Digital skills (e.g. ICT skills, remote-controlling, data analytics, smart device handling, etc.)*: 43%.
- The most important soft skills gaps reported are i) *Critical thinking and problem solving*: 61%, ii) *Communication and collaboration*: 60%, iii) *Creative thinking and innovation*: 58%, iv) *Leadership and responsibility*: 51%.
- The most appropriate education and training method for acquiring and developing the required skills for both hard and soft skills are presented in Figure 3.

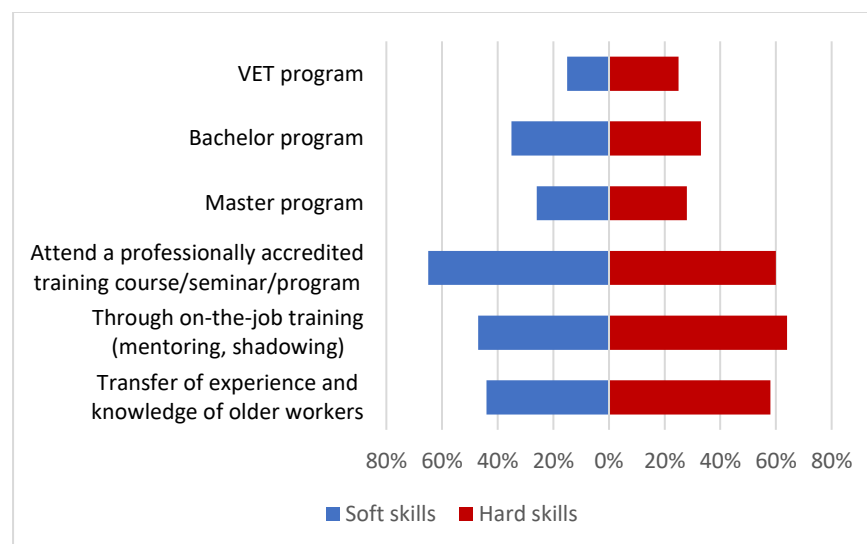


Figure 2: Preferred education and training method for acquiring hard and soft skills for the shipbuilding sector. (Source: authors' own elaboration on data)

### 3.2 – Shipbuilding Focus Group

21 Experts participated in the Shipbuilding Focus Group, contributing to the semi-structured interviews and the Focus Group meeting.

They provided sound experience in 49 industrial organisations from 15 Countries, including all the most representative for this industry in Europe. For statistical purposes, only one country and organisation per expert has been considered in the Figures that follow.

COUNTRIES	No Organisations
Belgium	1
Croatia	1
Finland	1
France	2
Germany	1
Greece	1
Italy	4
Poland	2
Romania	1
Spain	2
The Netherlands	1
Turkey	1
United Kingdom	3
<b>Total</b>	<b>21</b>



Figure 4 - Countries of the industrial organisations where experts participating in the SB Focus Group acquired their expertise.

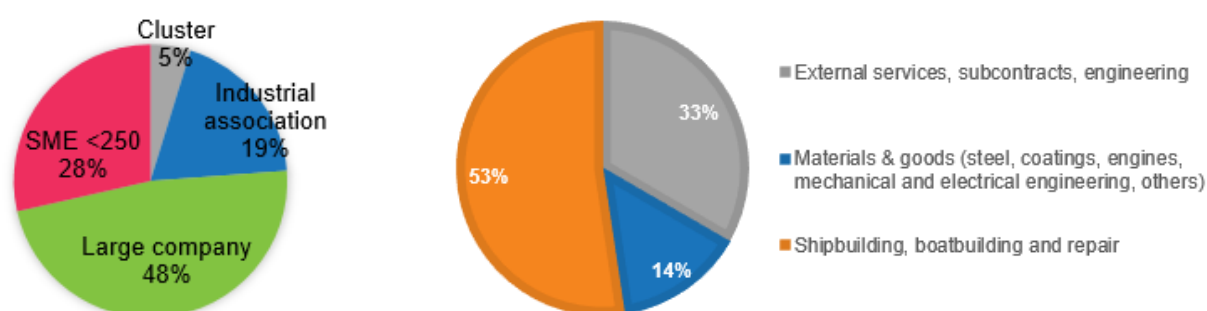


Figure 5- Representation of the type of organisations and activity of the industrial organisations where the experts participating in the SB Focus Group have acquired their experience.

### 3.3 – Shipbuilding Focus Group conclusions

The MATES Focus Group addressing the shipbuilding sector successfully conducted a remote meeting on 10<sup>th</sup> July 2020 between 15.00 and 17.30 CEST with the following [agenda](#)<sup>4</sup>. Overall, 15 invited experts participated in the meeting and gave their views and feedback on the upskilling/reskilling and employment needs, gaps in hard and soft skills, the misalignment of skills supply and demand and appropriate methods to be used for addressing current skill gaps and shortages. The ensuing lively debate was prompted by the presentation of the preliminary analysis on [shipbuilding skills needs](#)<sup>5</sup>. The key outcomes of the discussion are summarized below:

- The shipbuilding sector is in need of professionals (at management level) who
  - a. have a deep understanding of the sector and are fully aware of the relevant processes, time plans, associated costs, etc. so that they can successfully coordinate a relevant project, and

<sup>4</sup> Agenda of the shipbuilding Focus Group meeting:  
<http://intranet.projectmates.eu/index.php/s/YAEjmS47Cwe83ZG#pdfviewer>

<sup>5</sup> Presentation of the preliminary analysis on shipbuilding skills needs  
<http://intranet.projectmates.eu/index.php/s/C6nBnnBw6jS6r6j>

- b. can ensure that employees of different disciplines can efficiently work together, thus can also coordinate the relevant inter-disciplinary technical knowledge to be produced;
- The shipbuilding sector is seen to have currently a shortage of skilled employees at all levels and jobs. Due to the lack, for example, of skilled blue collar workers and technicians, it is quite common to employ engineers in order to fulfil existing needs. However, in most cases the latter prove not to have the required practical skills;
- The main gaps with regard to hard skills are therefore related mostly to engineering skills (especially electrical engineering) and automation as well as to skills related to the environmental performance of vessels (e.g. new designs and technologies for emissions reduction, new advanced materials for noise reduction, etc.); It was agreed that even if the IT specialists, particularly those involved in the integration of systems, do gain more importance, IT specialists are available for hire and can be outsourced.
- Young engineers often turn out not to possess the necessary practical knowledge and thus are not fully ready to meet industry needs. It is not possible to acquire such practical knowledge and experience through current educational programs (i.e. B.Sc, M.Sc, etc.) and thus alternative forms of training need to be developed and offered;
- Problems also arise from the lack of practical knowledge/experience that educators (e.g. university professors) possess, since in many cases it is clear that they are not fully engaged with the industry and its needs; two different trends in the training programs and their alignment with the industrial needs were signalled:
  - On the one hand, countries such as the UK, EEUU, and Australia promote a focused practical operational training. Their training programs are preparing people with sufficient practical experience for future employment in the industry, even if their scientific /academic level of achievement is not always so high.
  - On the other hand, in the southern European schema, as in Italy, France or Spain, academic preparation is by far the most predominant, but there is no alignment with the needs of industry. Possible solutions could be the provision of Internships during the final years and training schemas combining theory and practice (sandwich courses?).
- Working with people at different levels is not properly addressed at present at the University level. Industry actors must therefore closely cooperate with educational and training providers, so as to ensure that well-qualified professionals enter the market, thus shortening the time needed for new employees to adapt to their work environment and start providing added value to their company;
- It is important that there should be enough companies across the value chain willing to take part in training programs and to host students in their premises for a certain period. In that way the theoretical knowledge provided in academic institutions can be complemented;
- With regard to soft skills, team management, communication skills, leadership and multi-disciplinarity were found to be the top priorities. These have to be well integrated into educational and training programs, considering also the greater emphasis that the industry currently places on them; an increasing need of flexibility at all levels was also pointed out.
- Shipyards must also pay attention to the proper reform of their human resources policies and the mechanisms they have in place for the replacement of retired employees. While it

is very difficult to find appropriate replacements, it is important to be able to exploit the knowledge and long experience those employees have acquired over the years.

**When discussing the impact of COVID-19**, it was pointed out that the crisis will have a huge impact on the cruising companies, and this may affect the scenario of the skills gaps and training needs. A slowdown in new constructions will undoubtedly lead to a reduction of the workforce in the shipyards; in consequence, there will be a need to transfer workers to other maritime sectors. **Offshore wind is a sector that could accommodate oil and gas personnel (also in crisis), as well as absorb a part of the workers dismissed from the shipyards.**

Short pills of general knowledge are seen as an opportunity to gain knowledge in the situation of restrictions to mobility and in presence activities. Some companies have experience with webinars to address some of the priorities of the market, and the results of participation were very satisfactory; in many cases, the remote training approach will be kept.

### **Contribution to the Pilot Experience Green Maritime Hackathon**

The objectives and structure of the Green Maritime Hackathon<sup>6</sup> were presented along with the challenges for the participants to develop new business ideas and solutions within the framework of the event. A suggestion put forward by the group was to list some examples in each challenge so that some indicative directions are provided to the participants. This suggestion will be taken up by the responsible team (i.e. CERTH/HIT) and will be integrated in the current planning.

### **OL and the shipbuilding industry**

Resulting from the introduction of Ocean Literacy and the ensuing discussion as to how OL can be introduced to the shipbuilding industry, the following conclusions were reached.

- The experts stressed the overall need to educate and disseminate to the working force and the whole shipbuilding community the importance of the effects of shipbuilding activities on marine life.
- Such specifically targeted dissemination is essential because, overall, we need to reduce the impact of ships in the environment. However, dissemination alone is not enough as education is also needed in the market. In general, the main worry is to reduce costs rather than environmental impacts.
- Additionally, special attention and training should be given to the sector's work force in order to be able to evaluate the impacts on the marine environment of all life stages of a ship (designing, production and dismantling).
- The participants mentioned two of the most important environmental challenges that, according to them, are currently faced by the industry but not widely known by the target audience.:
  - One of these is the noise produced by ships and its impact on marine organisms.

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<sup>6</sup> The Green Maritime Hackathon is one of the MATES project Pilot Experiences that will be developed by the end of 2020. This Pilot Experience aims to demonstrate that open innovation events such as hackathons are a powerful tool for training and skills development, complementing the traditional forms of education. More information available at <https://www.projectmates.eu/pilotexperience/hackathon/>

- The second concerns the dismantling of a ship. It is important, that the building materials of a ship, during the design and production phases, should be selected, not only on the basis of cost but also on how their recyclability accords with environmental regulations. More specifically, there is a real need to change attitudes within the shipping industry.
- In general, there is up to the present, very little awareness or concern within the industry, with the connections between ships and the environment.
- Better awareness throughout the entire shipbuilding process as to how to *better* conduct dismantling would certainly prove to be an asset, and would guarantee better dismantling procedures. Thus the end of the ship's lifecycle could also diminish the impact on the environment (and thus for the entire operational life of the ship). The environmental impact of the production processes should be considered as well (components such as batteries etc.).
- Finally, not only people working in the sector but also the clients should be aware of the environmental regulations and the importance of adhering to them all along the entire value chain.



## 4– Offshore Renewable Energy sector results

### 4.1 Offshore Renewable Energy on-line questionnaire

Preliminary results were [analysed](#)<sup>7</sup> on 12<sup>nd</sup> June 2020, and were discussed with the focus group experts during the semi-structured interviews. The questionnaire process was finalised on July 17<sup>th</sup>, with the following results:

- 30 companies from the ORE industry participated in the questionnaire survey
- 5 European and national ORE Associations participated in a previously contacted semi-structured interview that investigated the same subjects
- 70.000 employees employed by the participating companies
- 71% of them involved in global markets
- 30% micro companies (<10 employees), 46% SMEs (10-249 employees) and 24% large corporations (>250 employees)
- The distribution of the respondents across Europe is given in the map in Figure 4.



Figure 6- Distribution of the ORE companies that participated in the questionnaire survey across Europe (Source: authors' own elaboration on data)

- The value chain segments, in which these companies are involved, are presented in Figure 5 (Site planning: 86%, Manufacturing: 43%, Construction & Installation: 71%, Operation & Maintenance: 80%, Decommissioning/ Recommissioning: 54%. The following figure presents these percentages.

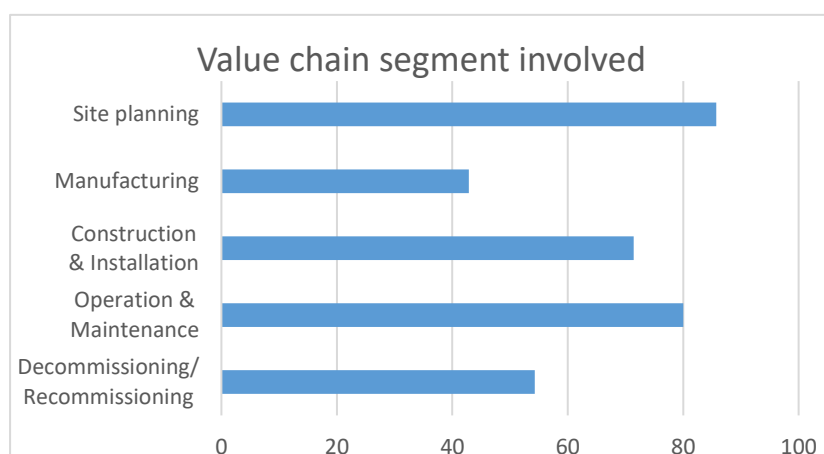


Figure 6- Involvement of the participating companies in the ORE different value chain segments (Source: authors' own elaboration on data)

<sup>7</sup> Preliminary results of the offshore renewable energy questionnaire <http://intranet.projectmates.eu/index.php/s/KyfX4pwWofmJWPW>

- Employees younger than 30 years old usually made up 10-25% of a company's personnel
- Employees older than 50 years old usually made up less than 10% of a company's personnel
- More than 45% of the participating companies review their personnel's skills on an annual basis
- These skills reviews mainly address the occupational groups of Engineers (74%), Technicians (50%) and Health & Safety professionals (38%), in descending order
- The majority of the companies face difficulties in recruiting well-qualified employees
- The most important hard skills gaps refer to i) *Project management* skills (56%), ii) *Engineering skills* (e.g. electrical, structural, etc.) (47%) and iii) *Digital skills* (e.g. ICT skills, remote control, data analytics, etc.) (44%), in order of priority
- The most important soft skills gaps refer to i) *Creative thinking and innovation* (56%), ii) *Critical thinking and problem solving* (53%) , iii) *Initiative and self-direction* (47%) and iv) *Communication and collaboration* (47%), in order of priority
- The most appropriate education and training methods for acquiring and developing the required skills are informal methods, which are i) *On-the-job training* (e.g. mentoring, shadowing, etc.), ii) *In-house training* (e.g. transfer of knowledge of older workers) and iii) *Professionally accredited training courses, seminars or programs*. Figure 6 presents the exact results on these.

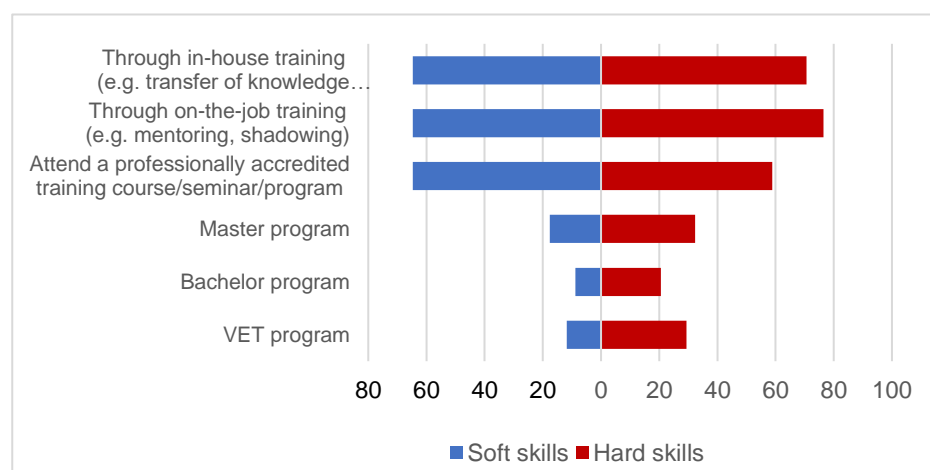


Figure 7- Prioritization of the most appropriate method for acquiring and developing the required hard and soft skills in the ORE sector (Source: authors' own elaboration on data)

#### 4.2– Offshore Renewable Energy Focus Group

13 Experts participated in the Offshore Renewable Energy FG. They provided sound experience in 26 industrial organisations from 10 countries, including all the most representative for this industry in Europe. For statistical purposes, only one country and organisation per expert were considered in the following Figures.

COUNTRIES	No Organisations
Belgium	2
Denmark	1
France	2
Portugal	1
Spain	1
United Kingdom	6
<b>TOTAL</b>	<b>13</b>

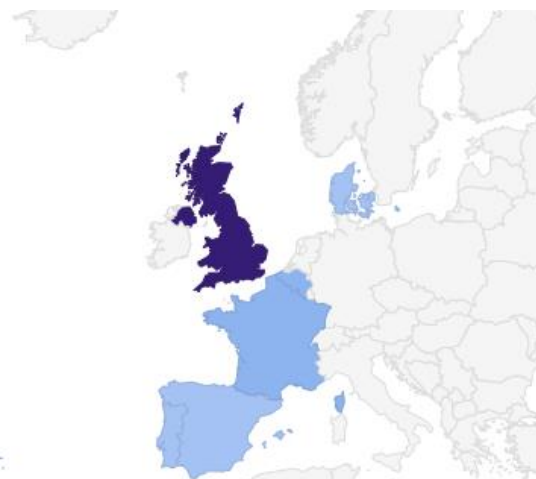


Figure 8 - Countries of the industrial organisations where experts participating in the ORE Focus Group acquired their expertise.

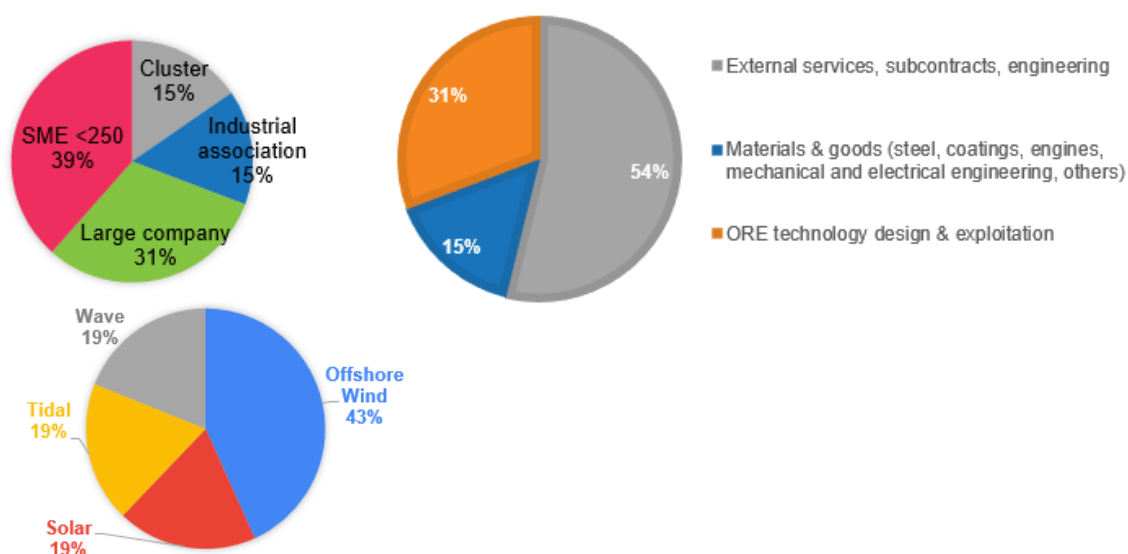


Figure 9 - Representation of the type of industrial organisations where the experts participating in the ORE Focus Group have acquired their experience, indicating the type of marine energy and activity.

#### 4.3– Offshore Renewable Energy Focus Group conclusions

The Focus Group for the Offshore Renewable Energy sector successfully conducted a remote meeting on 13<sup>th</sup> July 2020 between 15:00 and 17:00 CEST with the following [agenda](#)<sup>8</sup>. Overall, 13 invited experts participated in the meeting and provided their views and feedback on the upskilling/reskilling and employment needs, gaps in hard and soft skills, the misalignment of skills supply and demand and appropriate methods to be used for addressing current skill gaps and shortages. The presentation of the preliminary analysis on [offshore renewable energy skills needs](#) guided this debate<sup>9</sup>. The key outcomes of the discussion are summarized below:

<sup>8</sup> Agenda of the offshore renewable energy Focus Group meeting:  
<http://intranet.projectmates.eu/index.php/s/kNYTzAQSF5CRTYP>

<sup>9</sup> Presentation of the preliminary analysis on offshore renewable energy skills needs:  
<http://intranet.projectmates.eu/index.php/s/7piXR5Jryt2bCb7>

- Reskilling or upskilling is necessary in order to better support deployment activities and operations and maintenance, and should mainly focus on occupations transferred to the ORE sector from other traditional maritime sectors;
- Employability in several coastal areas of Europe is expected to increase in the near future, mainly as a result of developments in the offshore wind energy sector, while wave and tidal energy will also create employment opportunities but within a longer time horizon (i.e. until 2050);
- The main gaps in hard skills are related more to operations at sea and the need to cope with harsh working conditions. To this end, health and safety skills are of the utmost importance so that relevant accidents and incidents can be avoided;
- With regard to soft skills, gaps relate mostly to a need to develop innovative, creative and critical thinking, and to having good communication and collaboration competences for boosting technological development and deployment;
- The balance between hard and soft skills depends on the related technological advancements and the growth level of each ORE sub-sector;
- Existing skill gaps can be successfully addressed by combining desk-based training with on-the-job training or 'learning by doing' methods. Test sites especially can be efficiently exploited for this purpose after resolving any confidentiality issues that may exist. Relevant EU-funded projects can also contribute to better supporting this goal.
- Lessons learned from other offshore sectors (i.e. oil & gas), the onshore renewable energy sector as well as from relevant developments within the sector (e.g. floating wind structures benefiting from fixed ones) should be efficiently exchanged since the benefits to be derived can be important. Furthermore, with regard to health and safety, the efficient reporting of near-misses and incidents will be also very valuable for enhancing current safety levels.

**While discussing the impact of COVID-19**, the transfer of skilled personnel from the shipbuilding cruising sector to the ORE sector was analysed. **An important degree of relevance of the skills coming from shipbuilding to the ORE operation and maintenance activities was recognised. However, there is an important gap to be considered: shipyard environments are very different, depending on locality, country, previous history, etc. The use of test sites to simulate the ORE working context could be a major asset in efforts to improve the trainings to be offered.**

There is general agreement that our relations with remote training will change dramatically after the COVID experience.

The objectives and structure of the **Marine Energy Short Course** that will be developed as a MATES pilot action were presented. The challenges that will be addressed were listed. The suggestion provided by the group was to promote interaction among different stakeholders with different roles during the development of the courses.

### **ORE and Ocean Literacy**

- In comparison to the shipbuilding sector, people working in the ORE sector are more aware of the OL concept, following the growth of ORE in power cable installations, paying a good deal of attention to the seabed and the marine environment in terms of interaction between physical structures and the marine environment. There is

growing attention and focus on OL, the result of more awareness related to marine plastic/impacts of structures etc., also seen in junior engineers.

- UK and Portugal provide important inputs in training young people about Ocean Literacy. Academia in the UK specifically plays an important role in that area though there is still a long way to go.
- From the different occupations in the sector, junior engineers should be trained to become ocean literate.
- Up-to-date scientific knowledge of the marine environment is an absolute requisite for working in the Offshore Renewable Energies sector, as all activities take place within the marine environment itself. Environmental impact studies are therefore conducted for every new device used and whenever something is deployed at sea, it is always monitored closely and major efforts are behind each development in the sea: a large amount of information on their impact is available to the target audience. Nevertheless, those working in the sector do not all have or acquire this kind of knowledge. It mainly depends on their interests and background and how well informed they are on the latest developments, both technical and scientific.
- Quite apart from people working in the sector, it is above all the regulators who need to be aware of the marine renewable energy devices: how these behave in the sea as well as their interaction with the environment in general.



## MATES Consultation process to the industry 2020: Questionnaires, Semi-structured interviews and Focus Groups

This document was developed in the framework of the **MATES project, Maritime Alliance for Fostering the European Blue Economy through a Marine Technology Skilling Strategy**.

The objective of the project is to develop a skills strategy that addresses the main drivers of change to the maritime industry, in particular shipbuilding and offshore renewable energy. Both sectors are strongly linked and require new capacities to succeed in an increasingly digital, green and knowledge- driven economy.

Project duration: 2018 - 2021 (48 months) More information on the project is available at [www.projectmates.eu](http://www.projectmates.eu)

Document information	
Short description	This document, MATES Consultation process to the industry 2020, presents the results of the consultation process held between April and July 2020, to further validate and discuss with the industry the skills gaps and shortages of the existing workforce.
Next Steps	The main conclusions of this report will be included in deliverable 2.1 Baseline report on present skills gaps in shipbuilding and offshore renewables value chains.
Work Package	WP2. Strategy baseline: identification of present and future skills' needs
Task	2.1 Desktop analysis of relevant documents, strategies and elaboration of baseline discussion documents.
Dissemination level	Public / Project Website.
Use of the results	Licensed under Creative Commons Attribution-NonCommercial 4.0 International License. You are free to: Share (copy and redistribute the material in any medium or format); adapt (remix, transform, and build upon the material). Under the following terms: Attribution (You must give appropriate credit, provide a link to the license, and indicate if changes were made); Non Commercial (You may not use the material for commercial purposes).
MATES website link	<a href="https://www.projectmates.eu/results/deliverables/">https://www.projectmates.eu/results/deliverables/</a>
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