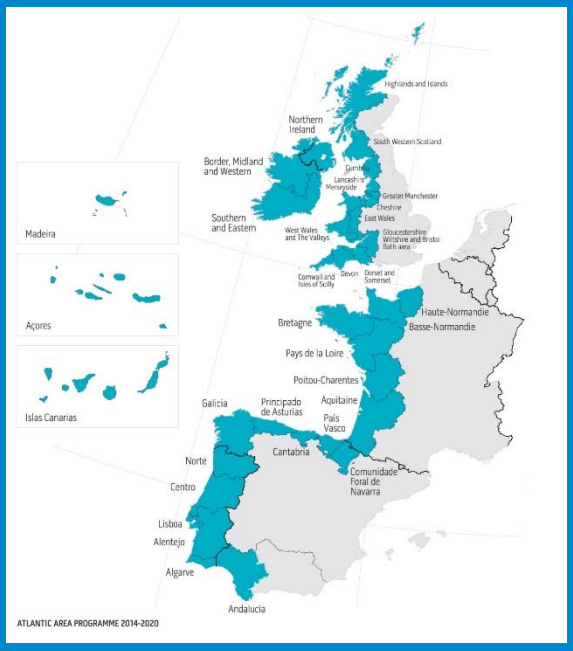
European Internationalisation Maritime Consortia

Work Package 4 – APPENDIX 1
Economic Sector and Territories Diagnosis



A Collaborative Document Developed by Consortex Partners

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Interreg Atlantic Area
European Regional Development Fund
EUROPEAN UNION

Document Type	Deliverable	
Document & WP No.	D	WP4
Document Title	Economic Sector and Territories Diagnosis	
Release date	12/10/2018	

Document Control Page		
Title	Economic Sector and Territories Diagnosis	
Creator	Dr John Hobbs	
Description	CONSORTEX Economic Sector and Territories Diagnosis, brings together data from across the Atlantic Area to inform the improvement of firms' market positioning, international sales and help them sign additional contracts.	
Dissemination Level[1]	CONSORTEX Partners	PU,

Revision history

Version	Date	Modified by	Comments
0.0	13/12/2017	John Hobbs	Outline of Document Skeleton
0.1	11/01/2017	John Hobbs	Socio-Economic Description Template Delivered – for each region
1.0	19/01/2018	John Hobbs, Eileen Crowley, Gerard O'Donovan	Further information required from partners on Economic Impact of sector at regional level and stakeholder Interviews
2.0	13/06/2018	John Hobbs, Gerard O'Donovan	Further information required from partners on Economic Impact of sector at regional level and stakeholder Interviews
3.0	1/10/2018	John Hobbs, Gerard O'Donovan	Integration of 1) Socio-Economic Description of each region (As per Irish example); 2) Economic Impact Analysis of the Marine Supplies Industry in each region and 3) Interviews with 5 key stakeholders in regional ecosystems.
4.0	10/10/2018	John Hobbs, Gerard O'Donovan	Deadline for partner inputs into final draft of the Economic Sector and Territories Diagnosis
5.0	12/10/2018	John Hobbs	Final Edited Document

[1] Dissemination level: PU = Public, CO = Confidential, CI = Classified

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Introduction

To understand the capabilities in each partner region, the Consortex partnership conducted 5 interviews with regional experts to add some much needed context to the Economic Impact Analysis of the Marine Supplies Industry in each region. The interviewees included managers / presidents of maritime cluster or association of maritime industry firms; representatives of Public Authorities (City Council, Regional Authorities); deans or directors of University Engineering and Nautical School); R&D centers manager or representatives; Trade Fair Managing Directors; Port Authorities or trade union representatives.

Each interview will refer to the shipbuilding and ship-repair, auxiliary industry, navigation, fishing, ports capacity and strategy at a regional level. The questions will include:

1. Definition of the situation. Its weight in the Regional economy.
2. Strengths of the sector
3. Weaknesses and major problems
4. Level of competitiveness of the industry
5. Importance of technological innovation, R&D etc.
6. Qualification and level of training of staff working in companies
7. Equality of opportunities in the sector and underrepresented groups (female, people with disabilities, minorities etc.)
8. Prospects for the future in the short / medium term (5 years)
9. Prospects for the long-term future (more than 10 years).

A full transcript of each of the interviews conducted at a regional level are provided in this Appendix.

Pais Vasco Region, Spain Interview Transcripts

Interview 1: Bilbao Port

Amaia Sarasola Marketing & Commercial Manager

Date: February 13th, 2018.
Time: 10:00
Place: Bilbao Port Authority HQ offices
Interviewer: Víctor Lejarreta (Alium Consulting – Foro Marítimo Vasco)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

The port has a great importance within the Basque industrial structure acting mainly on the activities of transport, logistics and repairing and supplying of ships. The aim of the port is to capture merchandise traffic, which has a multiplying effect on the entire Basque industry related to the maritime sector. The industrial structure of the area is an obvious incentive for this traffic collection.

In line with this question, and by an article that was published in the press the previous Sunday, the situation of the port of Pasajes was commented. Its decrease in traffic has to do with the situation of the Gipuzkoan industry, the disappearance of the Pasajes thermal power plant, which produced coal movement, the lack of a container terminal or the size limitation of the vessels which can access it, in a situation where the boats grow in tonnage.

2. Strengths of the sector. Keys to its success.

One of the fundamental keys to the success of the port of Bilbao lies in its important infrastructure for the settlement of industries. Its duty-free zone has a lot of space at the disposal for industrial companies with a clear export profile. They can find obvious benefits for their activity.

Another success key has to do with the reduced transportation costs involved in its use, due to the physical proximity of companies that use its services. These firms are basically industries with a large export activity.

Finally, we must also indicate as strength that the port is highly diversified by having terminals for all types of merchandise traffic, and even for people (cruise terminals).

3. Weaknesses, difficulties and most relevant problems.

The main one may be its geographical location, which is outside the major transport routes. In Spain, the most important area in merchandise traffic is the Mediterranean, where the three busiest ports are located (Algeciras, Valencia and Barcelona). The northern European route is also a competitor, with much larger ports like those of Rotterdam or Hamburg. These last ones, in spite of being competition, suppose also a complementarity with the port of Bilbao.

The port needs to increase the quantity and quality of the services offered to its users, which is more important than its price, an issue in which it is well situated.

4. Competitiveness level of naval industry companies.

In general terms it seems that the competitiveness level of the companies that interact with the port is high, due that the price and service are quite similar to those offered elsewhere in Europe.

The interviewee states, in any case, that said level of competitiveness depends on the model on which this comparison is established.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The port is in a constant process of innovation. Currently, we should highlight the innovations in Information and Communication Technologies (ICTs), mainly, the set up and implementation of the Electronic Commerce Platform. This platform allows a large part of the procedures that operators must carry out in a telematic way, achieving an important simplification of processes, saving costs and time, and providing a greater control over all operations.

It should also be highlighted that an automated truck access system has been installed at the port facilities.

Regarding technological innovation outside the scope of ICTs, there is an important way to travel for all companies in the naval sector in various areas, such as road transport and others.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The interviewee claims not to have knowledge of this matter outside of what happens in the Port Authority itself. As an indirect measure, she provides the information included in the Satisfaction Survey that this entity performs among the companies that use the port facilities. The results are quite favorable, from which it can be deduced that the training of the personnel is adequate.

Regarding shipping companies, freight forwarders and logistics operators, it seems to detect a significant turnover of its staff, without determining the reasons for such rotation. A consultation with their representative associations is recommended.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

The port activity has traditionally been monopolized by the masculine gender, which nowadays has no meaning even in the loading and unloading tasks that are completely mechanized. Despite this, the presence of women is testimonial. The situation is different in companies which perform administrative and management tasks.

There are companies that have equality policies, such as Bahía de Bizkaia Gas or Petronor, for example. The CSR reports of these firms can be consulted.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

The short-term trend is the moderate growth of port freight traffic measured in tons.

The shipping companies tend to become loyal to certain ports that offer good services and invest in terminals into them. In the case of Bilbao, the recent purchase of the container terminal by COSCO Shipping Ports (through Noatum) represents an international business opportunity.

9. Prospects for the long-term future (more than 10 years).

In the long term, port prospects depend on the competitiveness of Basque companies and their ability to export, which is in line with the Basque Government's industrial policy (reaching 25% of GDP provided by industry).

They also depend on global trends to offshoring or relocation of companies. A trend in this last sense would increase the volume of maritime transport and port activity.

The integration between industrial policy and port strategies is necessary.

10. Other comments and contributions not included in the questionnaire.

It would be interesting to include the results of the studies on the economic impact of the port on Basque economy in terms of GDP generating, maintaining employment and generating economic activity and jobs.

Interview 2: Tecnalia

Iñigo Lazkanotegi, Project Manager, Tecnalia

Date: February 20th, 2018.
Time: 10:30
Place: FORO MARITIMO VASCO
Interviewer: Víctor Lejarreta (Alium Consulting – Foro Marítimo Vasco)
Remarks: Interview made by phone

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

From the historical point of view, shipbuilding has been the engine of industrialization in the Basque Country. However, currently, the construction of large vessels has lost its position and there are no tractors for large projects.

On the other hand, small shipyards have found leading niches that allow them to continue operating in the market.

In maritime industry it is happening something similar to machine tool sector, which has lost volume, especially in relation to standard machines but, however, it has a great success in the production of very specific type of machines.

In general, the management strategies seek specific niche market. In naval sector the same thing happens because competitive value has been lost in relation to personnel.

2. Strengths of the sector. Keys to its success.

The most important key to naval industry success is its technological value and the supply chain, where there are companies with a great performance in the market. Also market differentiation and financing systems knowledge are key in a sector in which project financing is clue, as the naval construction has great peaks and failures (Navantia case, for instance).

There are success niches (specialization and collaboration between companies and institutions) in tuna boats, offshore and wind energy. Vicinay is also a success story.

3. Weaknesses, difficulties and most relevant problems.

Large shipyards have little product differentiation.

There is no joint vision of shipyards, companies, banks and institutions to develop a subsector. There is no unity of action.

4. Competitiveness level of naval industry companies.

Competitiveness is very high throughout the supply chain, above all, upwards. What is missing is a tractor, a large shipyard needing a lot of supplies from the ancillary industry. As a strategy, it is positive to work for foreign shipyards instead of for local or national ones.

Business opportunities in recreational boating have been lost. This is a subsector where there is enough technology and know-how, but it has been left to die. It has been oriented only to the local market, and that does not have enough capacity.

5. Importance of R+D+I in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Here, we have a great knowledge on how to build vessels. The problem is that the sector works outsourcing tasks and activities. It is not possible to do R+D+i from the shipyard due to its lack of specialization. Research is made by suppliers and throughout the supply chain. La Naval, for instance, does not have a critical mass or specialized product to justify researching.

R&D could be done from the shipyard only if there were enough specialization, as it happens in other countries with specific products (cruise ships accommodation or pipes manufacturing in Bremen shipyards).

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

Shipbuilding must move towards specialized products in which a skilled workforce with high added value works. So, the qualification of the staff will have to be improved. In any case, there is a part of the work with low added value that can be covered with low qualified foreign personnel.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

In less added value tasks the gender composition of the workforce is highly masculine. This situation is changing, little by little, in the most qualified jobs and with the most added value tasks.

With regard to people with disabilities, technology will be able to greatly improve this equality of opportunities, since a large part of the work will be automated. And it is not only a question of physical disabilities but, due to the age composition of the population, the need for technological aids will grow, even at work.

Industry 4.0 is going to make important contributions in the near future, probably with disruptive technological developments that will come from Asia and that, little by little, will become essential.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

In the short term, the trend has to be the search for highly specialized market niches, as it happens in the case of the offshore sector.

9. Prospects for the long-term future (more than 10 years).

In the longer term, technology and automation can produce disruptive changes in the shipbuilding industry, even though it is a sector of slow movements due to its financial complexity. There may be points of inflection in relation to elements outside the sector but that have great importance in it, as it happens with the price of oil.

10. Other comments and contributions not included in the questionnaire.

In general, it is an industry where there is technology and knowledge and some niches that work very well, such as that of tuna boats, offshore or the offshore wind sector. However, there is a lack of an engine that drives the whole sector, since the large shipyards do not fulfill this function at present.

Interview 3: University School of Nautics and Naval Machines

Jose Ignacio Uriarte, Deputy Manager of Nautical Training

Date: May 13th, 2018.
Time: 13:00
Place: University School of Nautics and Naval Machines (Portugalete)
Interviewer: Víctor Lejarreta (Alium Consulting – Foro Marítimo Vasco)
Remarks: Prof. Fernando Cayuela also participated in the interview.

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

The activity of the center is aimed at the training of professionals of the sea (in bridge and machines room sections) for shipping companies everywhere in the world, so it is difficult to venture the general situation of the sector. The sector has gone through many ups and downs and is closely linked to the price of oil, so that if it is low, maritime activity is reduced. Now the situation is intermediate, taking into account that maritime traffic accounts for 80% of world freight transport.

Currently, the center receives few students. Vocations are lacking. It can be related to salaries. Years ago, merchant sailors earned much more money than they do now. The extra money that is charged on board does not justify, for many people, the discomforts of life on board, so the profession has lost attraction for many profiles of professionals.

2. Strengths of the sector. Keys to its success.

The training received by the students from the center is very exhaustive, so these professional profiles have a lot of work possibilities outside the world of navigation in related activities as ports, consignees, customs agencies, Maritime Administration and so on. It is a natural job opportunity, but in any case, it should be clear that this is not the center's objective, but the training of bridge and engine room sailors.

3. Weaknesses, difficulties and most relevant problems.

The training offered by the center requires many practices, and requires very expensive facilities which, on occasions, are not available, such as the case of simulators, which are very expensive, or the facilities for training in firefighting. The issue is solved collaborating with other institutions, as is the latter case with Fire Stations.

To embark, a specific practical training is required (there are more than ten Specialty Certificates). There are private training centers which offer this training, but their services are very expensive.

The activities of the center are registered in a very strict system, with controls, even in training, by IMO and other institutions.

4. Competitiveness level of naval industry companies.

The shipping companies are strong and solid. The tendency is to grow, with a high level of competitiveness worldwide.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The training of the center is not oriented to research. Research activities are more related to maritime sector engineering. In nautical training, research is carried out exclusively by people who choose to

develop their professional life in the world of teaching. Anyway, some activities in research has been introduced in the center since the adoption of Bologna Plan.

Although sea professionals do not work in research, it is evident that they have to be up to date with technological advances in shipbuilding and all technologies used in new vessels, since they must performace their profession with them. They have to adapt to those changes, which nowadays are very important.

They also have to adapt themselves to the constant vigilance of the institutions which control them (IMO and others).

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The level of professional qualification of the bridge and machine room officers we have in the Basque Country, and who leave the center, is very high. It is up to the training of any other professional worldwide. It is possible to speak of overqualification in relation to the fact that some shipping companies may prefer other less qualified but much more economical human resources.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Only between 20 and 25% of professionals in this sector are women. Their performance of the profession is perfectly comparable to that of his male colleagues. However, it is true that they find it more difficult to continue on board due to the lack of conditions that favor work and family conciliation in this sector. Regarding the presence of foreign personnel, it is a constant, since the crews are multinational, not providing any problem for the performance of the profession or integration in the sector. It should be highlighted that there is great competition with people from other countries or with less knowledge, but who can be hired for less money. This type of competition occurs throughout Europe.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

In the short term, it does not seem that the situation of the merchant sailors will change. The great change happened 40 years ago with the emergence of competition from personnel from developing countries. It is presumed that the near future will be, in this respect, similar.

9. Prospects for the long-term future (more than 10 years).

Through mass media, it is talked a lot about the autonomous ship, designing a near future of unmanned freighters that transport goods around the world. It is a very attractive idea, but nevertheless, the sea is a chaotic environment where autonomous navigation is going to be more complicated than by land or air, so the crew will still be necessary. What is seen as highly probable is that many navigation processes were automated and the crews were reduced considerably, until

reaching a situation in which large ships were handled by two or three people. These professionals will earn high wages.

The situation of the profession and the crews has been quite stable since the 1980s and it is difficult to know what will happen in the long term. There will still be a lot of maritime transport and the difference will be how this transport will be carried out.

10. Other comments and contributions not included in the questionnaire.

In this economic activity, the work carried out by professional associations and clusters is very important, as it is the case of ADIMDE and Foro Marítimo Vasco, which achieve important synergies, thanks to which the sector continues being important. It is necessary that the Public Authority defends and protects the profession of the merchant seaman, which is not very well treated nowadays and which, nevertheless, is an important asset for the Basque economy.

Regarding the training and qualification of professionals, in Spain there is an excess of training centers. There are seven Nautical Schools in operation, the same as in the times in which enrolment was very high.

Interview 4: Bilbao Exhibition Center (BEC)

Sergio Alart, Exhibition Manager, Bilbao Exhibition Center (BEC)

Date: May 30th, 2018.
Time: 10:00
Place: FORO MARITIMO VASCO
Interviewer: Víctor Lejarreta (Alium Consulting – Foro Marítimo Vasco)
Remarks: Marimar Sánchez (Foro Marítimo Vasco) participated.

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Shipbuilding is a very mature sector. Historically, it has been a very important sector for the Basque Country, since we were pioneers from the Middle Ages.

Worldwide, there is an excessive offer in shipbuilding. There is a lot of unfair competition, not only from Asian countries, but also from others closer such as Holland. The naval industry is very atomized and works by ups and downs (sawtooth), since their projects last two years.

However, we are facing a situation of optimism with clear signs of recovery, after the hard years that our economy has gone through in general and the naval sector in particular. We are in a moment of

fleet renewal as it is demonstrated by the number of orders and new projects that our shipyards and ancillary industry are confirming. And taking into account the forecasts of economic recovery, and the consolidation of the new general system of tax rebates to shipowners, we have a clear position for international prescribers to once again trust fully in our sector and their capabilities, although there may be external to the sector variables that may influence its evolution.

2. Strengths of the sector. Keys to its success.

The Basque Country is a coastal area with a high maritime culture. This fact has caused that naval sector, together with other maritime sectors, to become strategic for its economic activity. This "imposed" reality has forged the tenacity and fighting spirit of our professionals, who have demonstrated over many years, great abilities to adapt and innovate. Qualities that have turned the Basque naval sector into an specialized in ships of high technological components industry , becoming a clearly export and internationally competitive sector.

At an international level, the Basque shipbuilding sector and its ancillary industry is small, but has become a benchmark for its products and quality. Its human resources are highly qualified and there are several small family businesses that have become a global reference in their productions. Shipping companies and shipowners are also an important part of the sector.

In fishing, the Basque Country is a benchmark in the production of freezer tuna vessels and inshore vessels, despite the fact that the European fisheries policy has led to the disappearance of part of the fleet. Even so, the Basque is one of the most powerful, especially in tuna boats. Also the two ports are fundamental in the development of the maritime economy of Euskadi.

3. Weaknesses, difficulties and most relevant problems.

For this industry, the main difficulty is the market in which it operates itself. There is a single global market, in which any company from any country can supply their products and their prices. It is a market with supply saturation. Some countries have a very cheap workforce and give illegal state aid. Europeans, for our part, are very strict in complying with legality, but that makes them more sensitive to a largely disloyal competition. There is a real legal vacuum.

Faced with a market as mature and competitive as the naval, with excess supply and capabilities, the sector must strengthen / lead a market niche against the brutal competition and demands that exist worldwide.

4. Competitiveness level of naval industry companies.

It is very high. In fact, there are family businesses that have become world leaders in their market niche. But, above all, it is very important to obtain synergies through technology centers, clusters,

business associations and the support of both public and private institutions. In this sense, the Basque Country is a world reference.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

R+D+i is of fundamental importance for Basque companies in the sector, and their level in this field is very high for their size. Of course, it would be good to devote even more economic and human resources efforts. The naval industry must go towards specialization and internationalization, since today it is not possible to focuse the company only towards the national market. The specialization, on the other hand, supposes more and more investment, reason why more resources are needed. Without resources for innovation it is not possible to succeed in the global market. It is the key point.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The qualification level of the workers in the sector is exceptional. The problem is that this is a cyclical sector in which sometimes, there are periods of crisis that lead their labor force to migrate to other industrial sectors outside the naval and, later, it is very difficult to recover them.

Such highly qualified personnel is difficult to be found and is lacking in the companies, while there are a surplus of University graduates. It would be necessary to encourage students much more towards industrial vocational training, especially in the naval sector, where the requirement of qualification is higher than in other industries in our environment. And, of course, it is essential that there were good continuous learning programs for workers currently active.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

This economic sector is strongly masculinised, with a very limited presence of women, practically reduced to the areas of business administration and commercialization of products and services, without being detected a tendency to improve this proportion in the field of production. And the same happens with other underrepresented collectives.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Nowadays the economic perspectives are good. New ships are beeing ordered. With the rise in the price of oil, more offshore vessels are being built and, in general, we are in a moment of renewal of fleets, including fishing. At the national level, there are new contracts to build ferries, a field in which Asian competition is not important, although at the level of the Basque Country, we will not be able to take advantage of this positive trend because we are more focused in fishing vessels (tuna freezers), offshore boats and, in general, support ships.

However, there is a lack of La Naval tractor effect on the ancillary industry, which has had to internationalize, with sales reaching 90% of its production abroad. The loss of the contract to build a

ferryboat for Balearia has been a serious setback, since it could have opened a new market niche in high quality ships.

In addition, we face an overwhelming unfair competition from East Asia and emerging countries, so the support and involvement of European and national institutions will be decisive. But we also face a fierce struggle within the European market, sometimes with incomprehensible regulations imposed or with unfair actions.

And always without losing sight of those elements outside our competencies, such as the price of oil, the decrease in freight rates in the offshore market (one of the niche markets in which we have specialized), the economic situation at global level, and a maremágnum of challenges that almost every day will arise, and to which we must know how to adapt.

9. Prospects for the long-term future (more than 10 years).

In the long term, since it is a cyclical sector, it is necessary to look for new niche markets, what in the Basque Country is already being done, such as, for example, that of marine renewable energies, that can generate a remarkable business for the ancillary industry.

The support of Public Institutions will be very important, especially through the maintenance and development of Technology Centers.

Initiatives to find new market niches can also be led towards ports, whose services require more and more technology, which may represent a business opportunity for the sector, as well as diversification towards supplying other non-maritime sectors.

And, of course, we must bet on innovation and specialization, which leads us to a continuous investment, qualified training and collaboration among all the agents that belong to the sector. It will be conclusive a continuous modernization of the companies, the control of their capacities, the fulfillment of the deadlines of delivery, the financing, the reduction of costs in the production processes, the innovation, the collaboration and creation of synergies and of links between interrelated sectors, such as the marine renewable energy... In short, a long list of factors to which we must know how to deal, if we intend to be competitive in a market as complex and overwhelmed by the existing supply.

10. Other comments and contributions not included in the questionnaire.

What is clear is that competition is not within our country and between the companies in the sector, but between this industry and international competition. That is why the internationalization of companies, institutional support and public-private collaboration is fundamental.

Marine renewable energies represent a clear business opportunity, since there is a very powerful ancillary industry that has the technical capacity to supply components for this new sector and there are prescribers such as Iberdrola and Gamesa. In addition, working in offshore wind can open the doors to other products related to the generation of electricity at sea, such as tidal and wave energy. But

this requires collaboration between companies and the support of the largest ones and public institutions.

Interview 5: Asociacion De Industrias Maritimas De Euskadi (ADIMDE)

Javier Lopez De Lacalle, Manager ADIMDE

Date: June 26th, 2018.
Time: 11:00
Place: FORO MARITIMO VASCO
Interviewer: Víctor Lejarreta (Alium Consulting – Foro Marítimo Vasco)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

The subject can be approached from three points of view: the local one, the national or European one, and the global one. From the global point of view, 2015-16 have been years of very low shipbuilding. 2017-18 are being years of slow recovery from very low levels. An increase in the number of contracts for shipbuilding is foreseen in the coming years, starting a gradual but not intense recovery.

At the European level, the situation is similar, although the growth is greater, especially for passenger ships (cruise ships and megayachts), Ro-ro, oceanographic boats and fishing vessels. Although Europe is not a leader in shipbuilding measured in tons (18% of the global market), it really leads the produced value, reaching 28% of the world market.

At the local level, apart from the current problem of La Naval shipyard, the situation is positive, working on fishing vessels (tuna and fishing boats with fish processing on board) and on equipment for offshore wind power plants. Engineering companies and naval equipment are growing up. These companies have a highly exporting component, selling about 75% of their production abroad.

In general, we are moving towards a staggered growth scenario with more contracts until 2030 from a situation of very low hiring.

2. Strengths of the sector. Keys to its success.

Five elements define the strength of the naval industry in the Basque Country:

a) The experience and know-how. Shipbuilding has been linked to this territory since the Middle Ages and has accumulated excellent knowledge on the subject.

b) Specialization in several market niches where it is high competitive: fishing vessels, tugboats, dredgers, oil & gas vessels ... All of them are boats with high technological content and high added value.

c) Flexibility and adaptability to the owner's needs. Here, ships are not serial, but tailor made.

d) Large accumulation of ancillary industries in a very small territory. This circumstance offers great professionals (welders, pipe fitters...) to the shipyards and their outsourcing companies become authentic partners of the shipyard.

e) High technology applied in companies, which export to the whole international market, as well as the supply of engineering and other services.

3. Weaknesses, difficulties and most relevant problems.

The two major problems of Basque shipbuilding are its size limitation and European competition. (a) Regarding size, it must be said that, with the exception of La Naval slipways, the rest are small shipyards with a clear limitation on the size and type of ship they are capable to build. In addition, they are competitors in the market and a lack of collaboration between them to approach other clients and to be able to offer larger vessels is detected. (b) In European competition, it should be noted that Holland, Germany and Norway are three competing countries which are physically too close to our environment.

4. Competitiveness level of naval industry companies.

The level of competitiveness of Basque companies is very high, both in technology, product or price. We have the capacity to face the construction of any type of boat, regardless of its technological complexity (hybrid propulsion, gas, batteries ...) and for any market. Companies in this industry export more than 65% of their turnover, which gives an idea of their level of international competitiveness. In addition, many of these companies are subcontractors in large shipyards around the world and address projects that include new technologies.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The Basque Country is implementing the Industry 4.0 Master Plan. This plan will develop the implementation of new technologies (digitization, robotics…) in the shipyards in a horizon of ten to twelve years, which will mean a qualitative leap in the processes of production, marketing and quality. This is especially important in an industry characterized by tailored and not serial production.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

In the shipyards, we have a very high professional level, although in recent years knowledge and training has been lost due to early retirement from 52. This loss is difficult to recover, especially considering that the activity of the shipyards is a cyclical activity with saw teeth. The shipyards need a Training Plan that attracts young talent. This would be linked to the Industry 4.0 Master Plan, which includes activities related to digitization, robotics, big data, sensor technology… Greater adaptation to new technologies is required.

The ancillary industry, on the other hand, has been able to produce an efficient generational change, attracting high qualified human resources.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

It is evident that the participation of women in this sector is practically testimonial in the field of production, although there is more female presence in tasks related to management or marketing.

Some years ago, there was a very interesting experience: for the production of the LNG ships tanks, courses of aluminum welding at zero degrees specially dedicated to women were organized. These professionals worked on this type of welding with very good results. Unfortunately, when this type of ship stopped being built due to the impossibility of increasing its size, the project has not had continuity.

In the ancillary industry, the participation of women is greater than that of shipyards. The same happens with other underrepresented collectives.

In times of more work, the shipyards have resorted to the hiring of a significant number of foreign professionals (welders, pipe fitters and boilermakers) from Romania, Ukraine, Poland or Portugal. In some cases, they have established local companies that continue to provide their services.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

In the short term, a sustained but not spectacular growth in shipbuilding is expected, with increases of around 3% per year. However, this sector is subject to external factors that may significantly affect its development, such as steel or oil prices (above $ 70 a barrel), or tariffs that the United States plans to impose.

9. Prospects for the long-term future (more than 10 years).

In the longer term it is very difficult to make forecasts. Sustained and staggered growth is foreseen every four or five years.

At the technological level there is a lot of talk about the autonomous ship. There is a Norwegian project to supply containers through a fjord through this type of vessel. From the industry itself it is not clear whether that will be the way or not. Some people position themselves very clearly in favor and against the idea. In any case, it is not so much about the real technological possibility as for the possible legal and insurance implications, civil liability and so on, that this type of navigation could entail. It seems more feasible for non-polluting loads on small boats that conduct coastal navigation.

In any case, there is no doubt that the Basque industry would be able to face the technological challenges of this eventuality, given that the trend is towards automation in navigation, perhaps not total but, at least, partial.

10. Other comments and contributions not included in the questionnaire. (N/A)

Galicia Region, Spain Interview Transcripts

Interview 1: Galician Government

Representative of Public Authority (Competitiveness Area).

Interviewer: Aida Ouréns Chans (Aclunaga)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

- *The shipbuilding sector involves 5% of Galicia's GDP and has a high international character, with 90% of the ships built for export.*
- *The 45% of the Spanish shipyards are Galician, and the auxiliary industry occupies more than 200 companies.*
- *The reindustrialization efforts of the last decades were very important to adjust the sector to market needs.*
- *It has become an industry of synthesis, the shipyards have become assembly plants in which the basic structure is built and the different components that the auxiliary industry creates, manufacturing by modules are integrated.*
- *Sector formed mainly by SMEs, with reduced staff and high level of subcontracting.*

2. Strengths of the sector. Keys to its success.

- *Customer-oriented specialization, the diversity of products and markets is not attractive for low-cost products.*
- *Increase in the global fleet and demand for vessel modernization.*
- *Need to meet regulations, environmental regulations etc.*
- *Greater work associated with the repair and reuse of ships.*

3. Weaknesses, difficulties and most relevant problems.

- *Fierce international competition*
- *Limited investment capacity of the sector*
- *Limited capacity for innovation, most of the companies are SMEs.*
- *High relative labour costs.*

4. Competitiveness level of naval industry companies.

- It is not possible to compete with Asian industry at the present time. The Asian effect will take time to reach our sector as it will first affect the heaviest and most specialized vessels in Northern Europe, after affecting them, it will also reach southern Europe.
- Today´s date, our competition is on the continent.

- Galicia provides customer-oriented specialization, non-serial products that are not attractive to low-cost producers.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

- *Efficiency in manufacturing is considered as a key point and of a great impact in the naval sector. The introduction of integrated systems throughout the production system is essential for greater efficiency.*
- *There is a need for differentiation, also a need to increase the productive and management capacity to be more competitive. Need for product development and own technology.*
- *It is a sector with some resistance to change, with very manual processes.*
- *To achieve greater capacity and efficiency, greater standardization of processes and greater information processing will be needed.*
- *The solution must be found in the adoption of new management models based on new technologies.*
- *The robotic solutions, for three-dimensional measurements, shaped sheets etc.*
- *Decision support systems, information systems through an interface that allows analysis and makes quick and safe decisions.*
- *Introduction of mobile technologies that facilitate planning operations, supervision of construction tasks. Sensory and communication technologies. Smart materials technology*
- *Modelling, simulation and virtualization of processes, wearables, augmented reality.*
- *Analysis of functional data for fault detection. Big Data, Cloud Computing etc.*

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

- *There is very little relationship between the training needs of companies and regulated training, this translates into a lack of specialists.*
- *The average age of the sector is advanced and there are no adequately trained young people.*
- *Lack of trained internal resources.*

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

It is unknown.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

- *The time of the current workload, could range between two years and ten that allow for example the future frigates for the Spanish state.*
- *Galicia is a national leader, covering around 1/3 of the national construction load.*

9. Prospects for the long-term future (more than 10 years).

- *In There is a diversification towards various market niches, which will mitigate the possible effects of a new crisis.*
- *The companies that lead the sector, both shipyards and auxiliary industry have been focused on international markets that allow them today to think of a wide range of options.*
- *The diversification and the capacity of adaptation to the client, are the bases on which the sector understands that it will maintain the competitiveness in the future.*

Interview 2: Innovation Centre for Maritime and Fisheries Law Studies

Managing Director

Interviewer: Aida Ouréns Chans (Aclunaga)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

- *The main objective of the foundation is to reinforce the competitiveness of the blue sectors in Galicia through the strengthening of maritime and fishing legal knowledge. Advice is offered to the private sectors on the provision of legal reports/studies on a specific topic such as "Fishing after Brexit" (analysis of legal instruments on how to regulate fishing and trade in fish products after the departure from United Kingdom).*

2. Strengths of the sector. Keys to its success.

- *From our perspective, it seems that they´re well organized at local, national and international level and increasingly internationalize, as for instance Aclunaga or Arvi which is part of Cepesca and at the same time presides Europeche.*

3. Weaknesses, difficulties and most relevant problems.

- *More information and knowledge of the different European and International legal system is required. Each time they´re in a more complex legal context and we notice that they need more specific knowledge to be able to act or react appropriately. Although all of them have their law firms, they also do not have specific knowledge of all the legal fields that affect the sector. Therefore, in our opinion, it´s important that our labour to function as a "hub" making available to experts from the academic world, law firms, legal services of public administrations or companies to address specific issues. We think that as much as reports, training workshops or round tables give them particular knowledge to face the complex legal reality.*

4. Competitiveness level of naval industry companies.

- For employers we see that they are increasingly competitive in markets that demand a high level of quality- be it in the market of fish products, or in shipbuilding (the building of the luxury cruise Ritz-Carlton at a Vigo´s shipyard). We consider that more and more European producers are chosen when it concerns to high quality products but not overcrowding.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

- *Obviously, it´s increasingly important- such as the implementation of the "paperless office" of the Port Authority of Vigo, the "virtual and augmented reality" in shipbuilding as CIS Galicia is one of the leaders. All these examples show that the sectors are aware and are investing in it.*

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

- *We think that the staff is well trained also in legal matters. However, the national and regional community legal frameworks undergo changes so often, it´s difficult to have an overview of all legislative changes. Because of the complexity of the issues, we work as a connection centre improving collaboration between experts who can transfer their specific legal knowledge to the stakeholders.*

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

- *We don´t see any inequality of opportunities since the managerial positions of many employers are occupied by women.*

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

- *At the meetings with the patrons of the Foundation, we have seen that all of them are aware of the strong competition at European and International level, and that they´re taking measures to improve their competitiveness by reinforcing their staff with people with specific knowledge. We think that they have prospects for the future are good and that they will to be left behind.*

9. Prospects for the long-term future (more than 10 years).

- *Not answered.*

Interview 3: Port Authority

Sustainability Department

Interviewer: Aida Ouréns Chans (Aclunaga)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

- *We are talking about a sector of great tradition in the Galician economy, representing approximately 3% of the GDP of the Galician´s Autonomous Community. Generator of thousands of jobs among shipyards and all the auxiliary industry that participates in the manufacture of final products, such as ships or structures related to the maritime industry, and all business activities derived from their commercialization.*
- *Besides this, it is one of the tractors in terms of the development of technologies and research derived from the shipbuilding activity for the region.*

2. Strengths of the sector. Keys to its success.

- *Undoubtedly the specialization achieved by the Galician industry has been and is the great strength of the sector. This specialization in the production of unique products with a high added value -technological and in terms of materials used and the quality of finishes achieved- is what has allowed Galicia to overcome complicated years in terms of workload. The implementation of specialized ships as oceanographic, patrol boats, factory vessels, workboats, has allowed the Galician naval industry to position itself as a reference in this type of vessels.*
- *Another of the great strengths is to integrate in the sector's value chain all the necessary actors for the implementation of projects of such a large importance, from the conception of the project; its financing and economic viability; the design and engineering, until the final preparation in the shipyards. As well as all the after-sales attention required.*

3. Weaknesses, difficulties and most relevant problems.

- *Mainly the great competitiveness at European and world level. The size and the logistic and technical possibilities derived from the size of our shipyards, as well as the problems derived from the financing in such a particular sector, in which the mass production is not common and all the products are unique.*
- *Another associated problem is the difficulty for the continuous training of workers. The lack of skilled labour due to the lack or deficiency of training plans appropriate to the real needs of the sector.*

4. Competitiveness level of naval industry companies.

- The ability to compete in the Galician naval sector is very high, only restricted by European and international competition and the limitations of infrastructure and logistics, but capable of competing and facing any project.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

- *The importance is relative, since although the large companies of the sector - both public and private - and technology centres have faced the innovation required by the demands of the market, the vast majority of the business sector - formed by small and medium companies - finds many difficulties to introduce technological innovations in their productive processes. Mainly due to an investment and return problem in the short and medium term.*

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

- *The training level of the workers and their qualification in terms of the current workload situation could be considered low, since it is very difficult to fill the positions. The lack of adequate training plans as well as their continuity in times when workload is scarce, means that currently the qualified workforce is limited; having to resort to foreign workers to cover the needs of the sector.*

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

- *It could not be said that there is an inequality of opportunities generated by the companies belonging to the naval sector, rather than the one derived from the structural deficiencies of insertion of the educational system and institutions responsible of the region since earliest stages.*

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

- *The short-term outlook is good because the workload is now assured in the coming years. The work carried out by the sector during the hard years of the crisis is bearing fruit, specialization, quality, good commercial practice and products with great added value have materialized in a favourable situation at present, and can be considered as a relevant region with a good name in Europe and also internationally.*

9. Prospects for the long-term future (more than 10 years).

The aging of the fishing fleet, along with the growth of trade and port activities globally, without forgetting about oceanographic research or the opening of polar routes will make it possible for shipbuilding construction and repair to have different market niches within its reach. Its intensity will depend on the international context and on the ability to adapt to an increasingly competitive and specialized market, which at least until now seems to confront.

Interview 4: Shipbuilding Company

Managing Director

Interviewer: Aida Ouréns Chans (Aclunaga)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

- *The situation of the sector linked to maritime activity in the Galician community has to be considered taking into account several hubs of activity. On the one hand, would be the shipbuilding and repair sector which, after a period of paralysis due to the economic recession and the problems arising with the old tax lease, is currently in the recovery phase, as shown by contracting data for the construction of new ships in the last two years, assigning to the Galician shipyards 33 % of all activity in the sector in the Spanish territory, and with a wealth that represents 2% of Galician GDP. Another of the activities linked to the maritime sector and whose specific weight is of great economic importance in Galicia, is fishing and its processing industry, occupying the Galician community the first places in the world ranking of canned food exporters.*

2. Strengths of the sector. Keys to its success.

- *Experience and tradition in shipbuilding and ship repair constitute one of the main competitive advantages of the Galician shipbuilding sector, which provides a highly appreciated know-how on the world shipbuilding scene.*
- *This knowledge, together with the specialisation in the construction of high added value ships, has positioned the Galician shipyards and their ancillary industry in a good position at world level.*

3. Weaknesses, difficulties and most relevant problems.

- *The small size of many companies - preferably in the ancillary industry - hampers growth and access to large contracts. This situation is aggravated by difficulties in accessing finance on favourable terms.*
- *Another problem in the Galician shipbuilding sector is the lack of qualified labour. The cyclical nature of the shipbuilding and ship repair activity, with periods with a lot of activity following periods of paralysis because many shipbuilding workers flee to sectors with more stable employment, leaving the shipbuilding sector without a qualified workforce.*
- *The difficulty, due to the current dynamics in shipbuilding processes, of automating tasks and optimising costs is a handicap compared to more technology savvy international competitors.*

4. Competitiveness level of naval industry companies.

- The Galician shipbuilding industry's commitment to the construction of highly specialised, high value-added ships has allowed the Galician shipbuilding sector to overcome the crisis and remain in a highly competitive market, in which Asian shipyards and emerging Eastern European economies have not yet been introduced.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

- *It is essential to bet on R&D if the sector wants to remain in the world market. For this reason, it is essential that both companies and the corresponding Administrations make an effective commitment to innovation, both in products and in the production processes themselves. The implementation of industry 4.0 must be a reality if we want to survive in the global market.*

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

- *The lack of specific formal training programmes for the naval sector makes it difficult for new workers to enter the naval sector. In this sense, companies are forced to hire workers with very general training, and then retrain them to adapt them to the needs of the sector. This leads to increased costs and a consequent loss of competitiveness for companies. This is what is meant by new entrants.*
- *As far as recycling training is concerned, the shortage of specialised centres and specific programmes is a major shortcoming in the sector.*
- *As for the management and command boards, as in the case of workers, there are no specific programmes that favour the incorporation of new graduates into the sector.*

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

- *Unknown.*

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

- *The current order book guarantees workload for the next three years, and the level of contracting is expected to be maintained in the medium term. Indicators such as the increasing escalation of oil prices, which favours the demand for auxiliary offshore vessels, in which Galician shipyards are highly specialised, give a glimpse of a stable future in the medium term.*

9. Prospects for the long-term future (more than 10 years).

The long-term future will depend to a large extent on our ability to innovate, to offer highly specialised and competitive products.

Interview 5: University

Professor of Naval Engineering

Interviewer: Aida Ouréns Chans (Aclunaga)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

- *The shipbuilding sector in Galicia is formed by more than 200 companies, between shipyards and ancillary industry, and its weights in the regional economy suppose approximately the 2% of GDP. The sector is of great strategic importance in Galicia, not only because of its weight in the Galician economy, but also because of:*
- *Its importance on a social level (for the number of direct and indirect jobs it generates, for its important repercussion on the regional socioeconomic environment as a whole and for its quarry of professionals of the most diverse specialities).*
- *Its high technological content.*
- *Its tractive capacity.*
- *Its high degree of internationalization.*
- *Its role as a supplier of essential means of transport in trade research, prospecting and extraction of energy products; and a supplier of advanced military vessels.*

2. Strengths of the sector. Keys to its success.

- *Mature sector*
- *Customer orientation*
- *Assessment of administrations*
- *Synthesis shipyards capable of coping with long periods of crisis*

- *Diversified and expert Auxiliary Industry*
- *Adequate geographical location*
- *Working capacity*
- *Adaptation to change*
- *Low real estate dependency*
- *Adaptation to environmental and safety regulations*
- *Knowledge of more market niches*
- *High internationalization (growing).*

3. Weaknesses, difficulties and most relevant problems.

- *Low level of technification of various phases of the ship project*
- *Labour cost compared to new competitors within the EU such as Poland, Romania and Turkey*
- *Low capitalization of companies*
- *Excessive dependence on the financing of working capital*
- *Lack of qualified and experienced personnel. Older workers about to retire cannot take over from younger people.*
- *Limited R+D+i activity*
- *Limited technological development of the companies of the sector in "Industry 4.0".*
- *Lack of renewal of training and knowledge management and lack of specific training modules for the shipbuilding sector.*

4. Competitiveness level of naval industry companies.

- At world level, the shipbuilding sector is defined in Asian terms: China, Japan and South Korea continue to be the countries with the highest market share. However, all countries have been affected in recent years by the crisis in the sector. What has allowed the Galician shipbuilding industry to overcome this crisis and remerge has been its specialization and its way of relating to the client, making specialized ships, quality, with total adaptation to the client and with very good delivery times.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

- *The Galician shipbuilding sector has a limited investment ability which inhibits the access to new technologies that will permit the increase of sector productivity. As an example of a tractor company in the 4.0 industry in Galicia, we can refer to the Navantia Shipyard.*
- *The technification and modernisation of companies is a key factor of competitiveness, as it allows for an increase in the productivity of companies, lower costs and greater efficiency.*

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

- *Training for the sector is not adequate since itineraries of general industrial areas are used, and there is a lack of specific naval training modules. Furthermore there is a lack of training renewal and knowledge management.*
- *I believe that a specific naval training plan should be drawn up to deal with the generational change that the sector has been experiencing in recent years and taking into account the new jobs that arise in the sector related to new technologies and industry 4.0.*
- *To this must be added the lack of specialised centres and the limited availability of employees to attend professional training.*

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

- *In the shipbuilding sector work a greater number of men than women, but there is nothing that makes us think that it is due to an incorrect business policy.*

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

- *It is expected that in the short term the number of ships in the order book will be maintained. The current workload in the Galician shipyards allows employment in the coming years, which reinforces the exit from the crisis experienced in recent years.*

9. Prospects for the long-term future (more than 10 years).

- *It is expected that with the diversification and the high degree of internationalization of the sector, new contracts can be generated and the workload maintained.*

Norte Region, Portugal Interview Transcripts

Interview 1: ASM Industries

Eng. Ricardo Morgado – Commercial Director

Date: July 19th, 2018.
Time: 14:00
Place: Head Office of AIN - Lisboa
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Very relevant in the Portuguese economy due the high quality and innovation of the products and services provided.

2. Strengths of the sector. Keys to its success.

High knowledge and specialization, long experience, well equipped in innovative areas. Credibility in the international market and good networks. Obtaining a concession area in the port of Aveiro for 25 years, to install an important production unit. Huge investment (6 M €) in new machinery, in Setúbal shipyards. High level of productivity and quality.

3. Weaknesses, difficulties and most relevant problems.

Lack of qualified and experienced professionals and, consequently great difficulty to recruit. Long period to train skilled professionals (2 years). Small size of the domestic market. Strong commercial competition from the external market. Lack of sectoral policies to support the Portuguese maritime industry. Delay of the Portuguese economy in terms of renewable energy compared to other European and world countries.

4. Competitiveness level of naval industry companies.

Experience of participation in multi-skilled projects, national and European. TEGOPI is the sole relevant competitor in domestic market.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Very important, for ASMI. Strong focus on R & D. Collaboration with international projects. Great needs of robotics.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

High qualified and trained technicians, according the high standards of qualification and training they establish. ASMI create the ASM Skills Program, an in-house training center, and formalized a collaboration protocol with MWS-Group – Master Welding Solutions, to conduct training in the field of welding for undifferentiated young people.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

There is no discrimination in gender.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Ensuring greater penetration or consolidation in the markets in which they operate.

9. Prospects for the long-term future (more than 10 years).

Increment the activity in marine renewable energies and the expansion of the continental shelf. The Portuguese "Resolution of the Council of Ministers", n. º 174/2017 is strategic for the future of this sectors, for the Portuguese companies and economy. Enlarging the network cooperation within maritime sector. Great need for ships of different type generated by the new industry.

Interview 2: ALMA Design

Eng. José Rui Marcelino - CEO & Design Manager

Date: July 11th, 2018.
Time: 11:00
Place: Headquarters of ALMA Design, in Paço de Arcos
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Very significant, not because of the volume of the generated invoicing itself, but because of the quality and innovation of the products and services provided.

2. Strengths of the sector. Keys to its success.

High knowledge and specialization in innovative areas. Importance of the business network to which it is connected. Various awards obtained in design products.

3. Weaknesses, difficulties and most relevant problems.

Small size of the domestic market, namely in maritime area.

4. Competitiveness level of naval industry companies.

Very competitive. There is a single competitor in domestic market. Experience of participation in multi-skilled projects, national and European, mainly.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Very important, for a company with innovative solutions. Strong focus on R & D. Active collaboration with multidisciplinary partners.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

High qualified and trained technicians and specialists.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Both genders.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

To increase the maritime market penetration, namely in Portugal.

9. Prospects for the long-term future (more than 10 years).

Maintain the level, if possible increment the level shown in the last twenty years. Enlarge the network cooperation with the naval sector.

Interview 3: ENIDH Escola Náutica Infante D. Henrique

Prof. Luís Filipe Baptista – President

Date: July 6th, 2018.
Time: 17:00
Place: Headquarters of ALMA Design, in Paço de Arcos
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Not quantified but with a lot of relevance, taking into account the contribution in terms of training of technicians, specialists and senior staff that provide the national economy and companies in the maritime and port sector.

2. Strengths of the sector. Keys to its success.

The only public higher education school in Portugal to train officers of the merchant navy. Specialization; long experience, since 1972, well equipped (navigation simulator, accommodation for 110 students). High employment rate of 97%, with predominance in maritime courses.

3. Weaknesses, difficulties and most relevant problems.

Poor visibility, insufficient communication, very closed school about itself Reduced demand in engineering courses.

4. Competitiveness level of naval industry companies.

Competitive in specialized training in maritime and port disciplines. Not competitive in relation to other schools in engineering courses, although of different specificities.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Very important for ENIDH which also carries out research in the area of navigation.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

High standards of qualification and training.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

There is no restriction. Only dependent on student demand and achievement in the disciplines for admission to the different courses.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Improve the visibility of the school through a better communication policy. Capture more students for engineering courses.

9. Prospects for the long-term future (more than 10 years).

Biggest bet on the foreign market. Especially in the Portuguese-speaking countries.

Interview 4: O.E. – Colégio de Engenharia Naval

Eng. Pedro Ponte – President, Naval Engineering College of the Portuguese Engineers Order.

Date: July 9th, 2018.
Time: 09:30
Place: Port of Setúbal Head Office, in Setúbal
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Naval Engineers are essential for the future of the Portuguese naval industry.

2. Strengths of the sector. Keys to its success.

Strong and prestigious training.

3. Weaknesses, difficulties and most relevant problems.

Small size of the Portuguese shipbuilding industry, particularly the construction of new ships. Higher education programs, in particular naval engineers, are very academic, being very disconnected from companies.

4. Competitiveness level of naval industry companies.

There are no other areas of training that can compete with the specific training of naval engineers.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Very important, concerning to the development of marine renewable energies and the expansion of the continental shelf. R & D should be more focused on the concrete problems companies face.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

High education level.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

No restrictions.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Regulation of the activity of the Naval Engineering.

9. Prospects for the long-term future (more than 10 years).

Increment the activity in marine renewable energies and the expansion of the continental shelf.

Interview 5: WEST SEA – Estaleiros Navais, Lda.

Eng. Filipe Rosa.

Date: July 23rd, 2018.
Time: 09:30
Place: Head Office AIN
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

They are two substantially different sectors; a (construction) that brings greater knowledge, more need for human resources and somehow more visibility, but entails substantial risks that can lead, as has happened and continues to happen, to the ruin of Reference Shipyards from year to year. The market for ship repair is a market which, while not as visible and predictive, i.e. we cannot predict and / or estimate the workload for the Shipyard annually, it is a market with a substantially lower risk.

At West Sea we are convinced that both sectors are important, when combined, so they must operate in a sustainable mix, which in our opinion should be 25-30% naval repairs and the remainder in shipbuilding, thus mitigating some of the risk associated with the construction and allowing the existence of the means necessary for the repair activity without additional costs.

2. Strengths of the sector. Keys to its success.

High quality standards associated with skilled workforce.

3. Weaknesses, difficulties and most relevant problems.

We believe Portuguese industry differentiate itself through the levels of the quality standards by which we execute and not so much by the price of the workforce; at West Sea we are investing in new (more automated) welding methods; as far as specialization is concerned, we believe that Shipyards should be positioned on core products and not on all types of ships..

4. Competitiveness level of naval industry companies.

There are no other areas of training that can compete with the specific training of naval engineers.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Shipbuilding and repair are very traditional and conservative sectors, so R & D does not play and therefore does not play a major role in the way the company operates and / or develop.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

For many years, in Portugal in particular, there was an absence of new constructions which led to a disinvestment of the people themselves in naval engineering courses and the immigration of many good professionals to other countries; in this sense we distinguish the lack of skilled labour to meet current and future needs.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

No restrictions.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Our greatest expectations in the foreign market and / or exporter are medium-sized passenger ships, since the large ones require facilities for which Portugal is not prepared to respond.

9. Prospects for the long-term future (more than 10 years).

N/A.

Lisboa Region, Portugal Interview Transcripts

Interview 1: LISNAVE – Estaleiros Navais, S.A.

Dr. João Carvalho dos Santos, Board Member; and Eng. Mário Pinho - Commercial Director.

Date: July 9th, 2018.
Time: 11:00

Place: Lisnave Head Office, in Mitrena-Setúbal
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Very important, because of the significant contribution of its turnover for the Portuguese commercial balance.

2. Strengths of the sector. Keys to its success.

Specialisation; long experience, very well equipped and situated. Credibility in the international market. Certified company.

3. Weaknesses, difficulties and most relevant problems.

Internal market does not exist for its size: Lack of sectoral policies to support the Portuguese maritime industry. Insufficient domestic labour market - difficulties in recruiting staff, despite the training provided by Lisnave for many years.

4. Competitiveness level of naval industry companies.

There are no competitors at national level.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Important considering new retrofitting, conversion or off-shore activities.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

LISNAVE is certified according the ISPS Code, ISO 9001 and ISO-14001, under which, quality, technical, environmental, safety and management requirements are comply systematically.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Due to the type of activity, the operational workers are totally men, on the other hand the administrative staff is majority female.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Continue with the program of rejuvenation and training new Workers, started in 2006, which ensured the admittance of more than 250 recruits.

9. Prospects for the long-term future (more than 10 years).

The entry into force of international regulations for 2020 creates the expectation of recovery and enhance of the activity for 2019 and 2020.

Interview 2: TECOR – Tecnologia Anticorrosão, S.A.

Eng. Carlos da Maia – Board Member and Partner

Date: July 5th, 2018.
Time: 10:00
Place: Tecor Head Office, in Mitrena-Setúbal
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Irrelevant in national terms, but with a relevant contribution for the maritime industry, precisely about 10 % of the turnover of its main customer, which is about 100 million euros.

2. Strengths of the sector. Keys to its success.

Specialisation; long experience, well equipped.

3. Weaknesses, difficulties and most relevant problems.

Strong dependence on a single customer, but looking for another domestic customers.

4. Competitiveness level of naval industry companies.

Leader in maritime sector, namely in ship repair, practically the unique in this business.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

TECOR is well attempt of all kind of innovation in his area and has already implemented new technologies and developed partnerships, in the field of research, with INETI-Instituto Nacional de Engenharia, Tecnologia e Inovação, I.P.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

TECOR is certified according the ISO-9001:2015, under which, technical, environmental, safety and management training are requirements to comply systematically.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Due to the type of activity, the operational workers are totally men, on the other hand the administrative staff is female.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Short-term prospects are, at the moment, focused on the naval maintenance activity of large vessels of different type, carried out by Tecor.

9. Prospects for the long-term future (more than 10 years).

In the medium and long term, businesses have adapted in order to find other distinct customers, mainly in internal market.

Interview 3: HEMPEL Portugal, Lda.

Eng. Pedro Carlos da Maia – Sales Manager Marine

Date: July 9th, 2018.
Time: 14:00
Place: Hempel Head Office, in Palmela
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Very relevant, as an exporter company.

2. Strengths of the sector. Keys to its success.

Specialization; long experience, well equipped; certified in various important areas.

3. Weaknesses, difficulties and most relevant problems.

Environmental risks, despite being a certified company in this and other areas that allow to minimize the environmental impacts of its products.

4. Competitiveness level of naval industry companies.

Leader in maritime sector and industry.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Very important for the whole Group. Each of Hempel's plants includes an R & D department.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

Hempel Academy offers two courses to help company employees enhance their coating inspection and application knowledge and skills. The Hempel Group has a longstanding association with the official FROSIO, the Norwegian Professional Council for Education and Certification of Inspectors of Surface

Treatment, who have approved Hempel Academy as training body and provider of courses preparing people for the FROSIO certificate exam.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

The HEMPEL Group's policy is: "do not tolerate racial, sexual or any other kind of harassment"

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

Consolidation of the application of the revised standard ISO 12994, in particular part 9, with a view to the study and application of anti-corrosion systems for off-shore structures.

9. Prospects for the long-term future (more than 10 years).

Develop new products and systems (such as the latest "Hempadur Avantguard 860"), continuing the innovative spirit of the Group's founder always with the concern of better serving customers with quality and environmental sustainability. Continue the social responsibility policy that are part of the Group's culture.

Interview 4: I.S.Q. – Instituto de Soldadura e Qualidade

Engs. Margarida Pinto – ISQ/I&D;David Pereira-Business Development; Victor Ferreira - I&D-Lab. Soldadura e Robótica.

Date: July 13th, 2018.
Time: 15:00
Place: ISQ Head Office in Tagus park – Porto Salvo-Oeiras
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

ISQ is a very relevant Group in the Portuguese economy in terms of domestic and external market.

2. Strengths of the sector. Keys to its success.

High level of its multi-skilled and specialized technicians and staff, in general.

3. Weaknesses, difficulties and most relevant problems.

Small size of the domestic market, namely in shipbuilding industry, particularly the construction of new ships and renewable energies Strong commercial competition from the external market. Lack of sectoral policies to support the Portuguese maritime industry.

4. Competitiveness level of naval industry companies.

ISQ is the largest consulting group on engineering and certification of the Iberian Peninsula.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Attending the tasks of ISQ both are strategical to ISQ. Strong focus on R & D department of ISQ.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

High qualified and trained technicians, according the high standards of qualification and training established by ISQ: quality, technical, environmental, safety and management.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

There are any restrictions in this subject. Both genders are admitted. General policy is do not tolerate racial, sexual or any other kind of harassment.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

ISQ believes that the domestic market of shipbuilding and vessel maintenance will have an increasing shift to other non-vessel construction sectors such as marine structures for renewable energy (wind and wave) and offshore aquaculture as well as in the mining area.

9. Prospects for the long-term future (more than 10 years).

Biggest bet on the foreign market, especially in the Portuguese-speaking countries. Enlarge the network cooperation within maritime sector.

Interview 5: TECNOVERITAS – Serviços de Engenharia e Sistemas Tecnológicos, Lda.

Prof. Jorge Antunes - CEO and owner.

Date: July 5th, 2018.
Time: 16:00
Place: ISQ Head Office in Mafra - Núcleo Empresarial de Mafra
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Irrelevant, in national terms.

2. Strengths of the sector. Keys to its success.

High specialization and long experience. Various certifications. It is classified as a Research and Development company.

3. Weaknesses, difficulties and most relevant problems.

Small size of the domestic and foreign markets; Strong commercial competition from the external market. Weak financial capacity.

4. Competitiveness level of naval industry companies.

Very competitive in maritime sector and engines, in the Iberian Peninsula in its area of activity. Experience of participation in R & D projects, National and European, in consortium or in individually.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Very important, for a company with innovative and patented technical solutions. Strong focus on R & D. Active collaboration with the universities and with officials of scientific and technological knowledge.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

High qualified and trained technicians.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Both genders, predominantly men.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

To get a new strong partner.

9. Prospects for the long-term future (more than 10 years).

The opportunity generated after 2020, with obligatory rules of de-carbonization.

Interview 6: Vera Navis, Lda.

Eng. Luís Baptista - CEO and Partner.

Date: July 10th, 2018.
Time: 10:00
Place: Vera Navis Head Office in Lisboa
Interviewer: Guadalupe Saião (AIN)

1. Definition of the situation. The weight of the naval sector in the Basque economy from the perspective of the represented institution.

Non-significant, in terms of national economy.

2. Strengths of the sector. Keys to its success.

High knowledge and specialization in naval architecture, shipbuilding software, and marine engineering.

3. Weaknesses, difficulties and most relevant problems.

Irrelevant position on the domestic market, for small dimension of it.

4. Competitiveness level of naval industry companies.

Competitive in external market. Experience of participation in multi-skilled European projects.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Both are very important, for a company acting in these areas.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

High qualified and trained technicians and specialists: marine, mechanical, chemical and aerospace engineers and designers specializing in this area.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Both genders. Presently, the company has 20 people, of which 60% are men and the remaining 40% are women, in this case including technical functions such as naval engineers and designers.

8. Prospects for the future of the sector in the short / medium term (up to 5 years).

To increase participation in the internal market, despite its small size.

9. Prospects for the long-term future (more than 10 years).

Maintain the acquired level in the European market, if possible increment it with other European countries.

U.K Atlantic Area Interview Transcripts

Interview 1: Invest in Cornwall, Marine Hub Cornwall, Cornwall Marine Network

Peter Holland -Business Engagement Manager, Invest in Cornwall
Matt Hudson -Operations Director, Marine Hub Cornwall
Kevin Collins - Marine Business Consultant, Cornwall Marine Network

Interviewer: Peter Green (National Maritime)

1. Definition of the situation in the naval sector in the region.

Cornwall Marine Network (CMN) is a membership owned organisation. CMN's main aims are to improve and grow the prosperity of the Cornish marine sector, to maintain and increase marine job opportunities, to improve the skills of the workforce and to encourage networking between its members. Invest in Cornwall/ Cornwall Development Company is the arms-length economic development company of Cornwall Council. Marine Hub Cornwall brings together world class assets with existing and planned programmes of activity to provide a seamless co-ordinated offer to the marine renewable energy sector. Cornwall and the Isles of Scilly accounts for 8% of UK marine industry turnover and an impressive 1 in 7 of all marine jobs in the country. It is estimated that the marine industry in the region is worth £500 million per annum and that it supports more than 14,000 jobs. It is located at the centre of a growing European energy industry, including fixed/floating offshore wind, tidal stream/range energy, wave energy, testing and demonstration. The region has access to deep-water resources in the South West approaches, Celtic Sea and European Atlantic Seaboard. On the South coast, Falmouth Docks has well-established deep water berths, excellent engineering services, and a highly skilled workforce. In addition, other ports including Fowey and Newlyn also provide excellent facilities. On the North coast, Hayle Harbour provides an outstanding waterside location for technology development. The region has a highly developed marine supply chain with exceptional support services, which has seen it play a leading role in the development of marine engineering. As a result, it has a dynamic group of Cornish based businesses with a strong track record of delivering world leading products, services and skills into the global marine markets. It is home to a number of shipbuilding and ship repairers, including Pendennis the world-class and award winning Custom Build and Refit superyacht yard in Falmouth, specialising in luxury sail and motor yachts 30-100m. The region provides access to some of the world's top thought-leaders and testing facilities from leading-edge marine research teams at the University of Exeter and Plymouth University. Facilities include the Dynamic Marine Component Test Rig (DMaC), the South West Mooring Test Facility, the COAST Laboratory and Wave Hub, the worlds largest and most technologically advanced site for the testing and development of offshore renewable energy technology.

2. Strengths of the sector. Keys to its success.

Cornwall's sector strength is based on an outstanding supply chain and highly skilled workforce, it has a highly developed marine infrastructure, including some of the world's best test facilities, access to the top thought-leaders and specialist expertise in marine research and a superb package of marine funding support for businesses. It is home to one of the world's largest natural deep-water harbours, it houses the largest ship-repair complex in the UK, providing capacity for vessels up to 100,000 tonnes and a complete range of marine repair services. It is a centre of excellence for Ministry of Defence vessels, ferries, mobilisation and demobilisation works, jack-ups, pontoons and tankers. The regions sector continues to develop its capability and is a world leader specialising in military ship refit, commercial ship repair, upgrade and conversion and shipbuilding. The region retains an acknowledged position as a centre for design, engineering, marine equipment and research. The region is further active in the European energy industry, including fixed/floating offshore wind, tidal stream/range energy, wave energy, testing and demonstration industrial services and energy sector. Cornish companies have strengths in a number of areas including; concept, detailed and production

engineering, marine operations planning, design, execution and monitoring, Front-end engineering design, Offshore and subsea engineering and installation project management, Naval architecture , marine sciences, autonomous vessels, subsea operations and diving and so much more.

The region proactively markets itself as a world of marine technology in one outstanding region.

3. Weaknesses, difficulties and most relevant problems.

As with all of the biggest shipyards in the UK. If the region is further successful in bidding for military contracts, the UK's Royal Naval fleet has an historic record of providing a fluctuating source of business. The danger for the region is that its biggest yards become heavily dependent upon military shipbuilding. To be successful, both the shipyards and the supply chain need to develop their global competitiveness for both military and civil work. There is uncertainty as to how the UK's exit from the European Union (Brexit) will turn out, and the implications for the regions heavily trade-exposed Maritime sector. Brexit touches on a number of different economic themes, and increases levels of uncertainty for the Maritime sector. For instance, GDP growth and inflation projections are currently under the spotlight given the slowing UK economy and weaker pound sterling. The regions shipyards may also have to deal with higher unskilled labour costs given that the supply of labour resource from Eastern Europe may not continue (as before) as part of a post-Brexit settlement. The sector has an ageing skills base and high wage economy.

4. Competitiveness level of naval industry companies.

Again the majority of larger civilian ships are now produced in the Far East on a scale not achievable in the UK. Despite this, there has been a renaissance in regional shipbuilding, which has driven in part by an entrepreneurial attitude towards pursuing opportunities in the commercial market. The regions sector is modern, efficient, productive and competitive. It is recognised for its excellence and high market rankings by value in design and manufacture of luxury leisure vessels, commercial and naval refits, supply of marine equipment and design, and construction and project management of complex warships. The regions businesses are competitively positioned to exploit the opportunities provided by trends associated to technology development and vessel design The regions testing facilities from leading-edge marine research teams is helping to establish a global centre of excellence within the region for marine and maritime innovation, knowledge and skills.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The region provides access to some of the world's top thought-leaders and testing facilities from leading-edge marine research teams at the University of Exeter and Plymouth University. Facilities include the Dynamic Marine Component Test Rig (DMaC), the South West Mooring Test Facility, the COAST Laboratory and Wave Hub, the worlds largest and most technologically advanced site for the testing and development of offshore renewable energy technology. The regions sector businesses have a good record of innovation. They recognise the need to support the principal innovations that will shape the market over the next 10 years; Environmental protection and emissions reduction,

Autonomous systems, Renewables, Propulsion technology, electronics and data management. The regions industries recognise the importance of R + D + I to develop its strengths and improve its competitive advantage.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The regions sector recognises that the training of all employees is paramount to the future success of its businesses. Many have expanded their training functions and are driving the number of apprenticeships and graduates in their respective organisations. Regional schemes focus on the continual development of a workforce to maintain the world-class standards which the regions businesses adhere to. Many of the programmes, have seen employees progress to senior positions such as project engineers, trade and project managers.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Yes, the sector businesses are making a concerted effort to help the industry move on and achieve a representation within it that is more in keeping with twenty-first century expectations.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

We want more of the world's most innovative marine technology businesses to locate to Cornwall. We will develop further the comprehensive funding support that our regional marine technology businesses need. Foster greater collaboration to provide world-leading support for marinetech businesses in Cornwall and the Isles of Scilly. We want to develop competitive regional shipyards and supply chains that are globally competitive for both military and civil work. This will help drive employment and prosperity benefits across the region and to drive international trade.

9. Prospects for the long-term future (more than 10 years).

For centuries, Cornwall has been a major player in the UK marine sector and marine engineering. The region is bringing together all the resources that are needed to support the existing maritime cluster and to develop the new marine technology products and services of the future. We want to ensure that businesses can access technology funding and research support, take advantage of a superb marine infrastructure that includes exceptional testing facilities, and work alongside other companies who are leaders in their field and can provide the specialist marine services that their businesses need. In addition we want support the development of competitive shipyards undertaking both military and civil work. At present the UK Governments commitment to growing its Royal Navy Fleet by 2030 is presenting the opportunity to rejuvenate the long term future of our ship yards. This brings certainty and the confidence for the regions industries to invest for the long term in its people and its assets,

which will help to raise productivity and innovation, and improve its competitiveness in the domestic and overseas markets. Many of the trends and uncertainties caused by leaving the EU will be less relevant over the coming years due to the structural impact of Brexit. Outside of the EU and the customs union, the UK will be in charge of its own trade policy, which presents both risks and opportunities for the regions trade. Furthermore, outside of the EU s free movement rules the UK would also be fully in charge of migration.

10. Other comments and contributions not included in the questionnaire. (N/A)

Interview 2: Marine Energy Wales

David Jones - Project Director / Cyfarwyddwr Prosiect

Interviewer: Peter Green (National Maritime)

1. Definition of the situation in the naval sector in the region.

Marine Energy Wales brings together technology developers, the supply chain, academia and the public sector to help establish Wales as a global leader in sustainable marine energy generation, making a significant contribution to a low carbon economy. Marine Energy Wales is an initiative set up and managed by Pembrokeshire Coastal Forum. Through the development of the regional supply chain, Marine Energy Wales is making a significant contribution to a low carbon economy with sustainable green jobs, growth, skills and development opportunities. By combining supportive policy with the allocation of €100.4 million of EU Structural Funds, alongside a £76 million City Deal for marine energy, Wales has created one of the most attractive global sector landscapes in the world. Wales is committed to achieving a transition to a low carbon economy. Its focus is to embed a wide range of technologies into the mainstream including on and off-shore wind, small and large scale hydro projects plus explore the opportunities available from its marine resource. Diverse natural resources, array scale demonstration zones, seabed leases and significant tidal range proposals further support the development of a new low carbon sector in Wales. It has a skilled maritime supply chain, world class research and port facilities, which alongside new carbon reduction targets makes Wales a key location for marine energy development. The Shipping industry is the largest constituent industry within the Welsh Maritime sector in terms of economic activity, directly contributing £518 million in domestic output, £141 million in GVA, and directly supporting approximately 2,251 jobs. The Ports sector in Wales is of paramount importance to the UK steel sector. Port Talbot is the largest integrated steelworks in the UK, and its continued operations are dependent on the ability to bring in raw materials from Brazil and Australia, and to ship the high-quality output around the world. Wales has strategically located ports which provide valuable supply chain and deployment support for offshore energy projects. Welsh ports have reacted positively to maximise the market potential of renewable energy projects. Wales has rich resources for academic collaboration.

2. Strengths of the sector. Keys to its success.

The Welsh coastline has a significant wind, wave and tidal stream climate as well as huge opportunities for tidal range. The regions marine sector is also home to the UK's largest single cluster

of energy related businesses, handling or processing approximately 20% of the UK's energy requirements. In addition to ship building the sector is expanding its industry base to include the renewables sectors, particularly wave, tidal and floating wind, but also to tourism and leisure and fishing industries. The region retains an acknowledged position as a centre for design, engineering, marine equipment and research. Its ports offer strategically important deep water sites on the UK's west coast. They continue to support the oil and gas industries with infrastructure and services. The region's extensive, highly skilled engineering and fabrication supply chain is also superbly equipped to keep these vital industries operating effectively. This experience is increasingly being accessed by the emergent marine energy industry. Milford Haven is home to Wales' largest fishing docks. The Anglo-Spanish, Belgian and an inshore fleet all land seafood here. The Welsh Government is working towards delivering an ambitious 70% renewable energy generation target by 2030. Marine energy is amongst the technologies that are being targeted to make a real difference to Wales. From consultancy and advisory services through to build, operational and decommissioning services, Wales offers a complete supply chain for developers. The Marine Centre Wales is a centre for innovation in applied marine science. It is a new national resource for Wales to meet the need for integration of research, commerce and policy in the marine sector. There is also the Marine Energy Hub, which is located on the doorstep of one of the world's best marine energy resources. It is a dynamic worksite where marine energy companies can come together and share space, facilities and knowledge to unlock the sector's full potential. It is currently home to a number of world leading developers and supply chain companies.

3. Weaknesses, difficulties and most relevant problems.

The region has no major regional ship yard. There is a need to invest in training providers to ensure capacity exists to deliver a future workforce with the skills required to support any future marine energy investment. There is already a regional sector workforce and skills availability issue.

4. Competitiveness level of naval industry companies.

The region does not build large merchant or military ship, its shipyards, like their European counterparts, now tend to concentrate more on niche markets and vessels with high technological content. The region has extensive, highly skilled engineering and fabrication facilities and is superbly equipped to support sector growth. The growth of its ship yards is being driven largely by its ports and an entrepreneurial attitude to explore other commercial opportunities. Enterprise Zones designated by the Welsh Government have been created to attract new business and strengthen the Welsh economy, making it more competitive. The Anglesey Enterprise Zone and the Haven Waterway Enterprise Zone are both perfectly located in the North and South of the country to complement the work of the Demonstration Zones. The Welsh coastline has a significant wind, wave and tidal stream climate as well as huge opportunities for tidal range and the regions sector has the potential to be a world-leader in the marine energy market. Its investment in a Marine Centre Wales and the Marine Energy Hub is bringing together and supporting the sector to unlock its full potential.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

As Wales makes its transition to a low carbon economy the importance of research and development within the sector is of high importance. Wales has rich resources for academic collaboration. Many companies are already involved in research and technology transfer projects with academic institutions including major organisations such as Rolls Royce, Siemens, National Grid and Hitachi. In regards to shipbuilding, the regions sector businesses have a good record of innovation and in-line with the national sector consensus predict that the principal innovations that will shape the market over the next 10 years will include; Environmental protection and emissions reduction, autonomous systems, renewables, propulsion technology, electronics and data management.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The average age of the regions workforce is high and there is a lack of adequately trained young people. The skills gap is one of the biggest challenges facing the regions maritime sector. Its industries are working with key education and training partners to ensure the existing and future workforce has access to the knowledge, education and training programmes needed to keep their business competitive. Many have expanded their training functions and are driving the number of apprenticeships and graduates in their respective organisations. They are also engaged with the regions 16 further education colleges, focused on the employability of their 200,000 students and with over 160,000 students in full-time education across the regions eight universities.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Yes the sector has historically been a male-dominated industry however the regions businesses are making a concerted effort to help the industry move on from that tradition and to achieve a representation within it that is more in keeping with twenty-first century expectations.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

The blue and green economies are already demonstrating great promise for Wales – from renewables to ship building and aquaculture to marine leisure. Current developers actively involved in Wales have indicated an expected investment of £1.4 billion in the next 5 years, provided market and development incentives are in place. We will continue to provide a strong, stable and secure environment for enterprise to flourish in Wales, as the region makes its transition to a low carbon economy and promote the designated Enterprise Zones to attract new business. We will continue to work alongside the public and private sector to establish Wales as a centre of excellence in the field of sustainable marine energy. Working alongside the Welsh Government and partners including; the Offshore Renewable Energy Catapult and Renewable we want to provide a comprehensive guide to the marine energy supply chain in the UK. We will further support and develop the regions ports and shipyards and develop supply chains that are globally competitive. The regions ports and shipyards

are key to helping us to deliver our ambition of creating a sustainable, low carbon future. In turn this will help drive employment and prosperity benefits across the region and drive inward investment.

9. Prospects for the long-term future (more than 10 years).

By combining supportive policy with the allocation of €100.4 million of EU Structural Funds, alongside a £76 million City Deal for marine energy, Wales has the opportunity to create one of the most attractive global sector landscapes in the world. In this time we believe that Wales will be well on the transition road to a low carbon economy. By this time we will have helped to embed a wide range of technologies into the mainstream including on and off-shore wind, small and large scale hydro projects and opportunities identified from our marine resources. We will have worked to realise the value locked away in our ports and introduced the right policies and the right strategic alignment to deliver jobs, economic growth and healthier, happier, more prosperous communities. The blue and green economies will be delivering great promise for Wales – from renewables to ship building and aquaculture to marine leisure.

10. Other comments and contributions not included in the questionnaire. (N/A)

Interview 3: Mersey Maritime

Chris Shirling Rooke – Chief Executive

Interviewer: Peter Green (National Maritime)

1. Definition of the situation in the naval sector in the region.

Mersey Maritime, the representative body for the Maritime Sector in the Liverpool City Region. The regions Marine and Maritime Sector comprises of some 1250 businesses making a combined contribution of £3.47bn, or 13% of, the regional GDP. Liverpool has undergone an amazing transformation in recent years. Merseyside is now attracting new investment and new people drawn by this exciting renaissance which makes the Liverpool City Region one of the most attractive UK inward investment locations in which to do business. Key activity includes over £3bn of construction and infrastructure projects planned throughout Merseyside over the next five years. Over £60m investment at the Port of Liverpool including a new roll-on roll-off freight and passenger terminal at Twelve Quays. The Port of Liverpool is one of the largest ports in the UK. It lies just three kilometres inland from the Irish Sea on the River Mersey and is located on both sides of the River Mersey. A recent investment called Liverpool2 created a new £400m deep-water container terminal. This port is capable of accommodating the world's largest container vessels. The Port of Liverpool receives dry bulk, liquid bulk, roll-on roll-off vessels, project cargo and forest products. It also provides deep water berthing facilities. The port also has the UK's first fully automated steel terminal. Situated in the North West it has one of the largest share of employment in UK shipbuilding and repairing sector. It is home to a number of shipbuilding and ship repairers, including the world famous Cammell Laird shipyard. The shipyards provide marine shipbuilding, refit, repair and conversion facilities. They also provide services for offshore wind, oil and gas, and the petrochemical sector. Cammell Laird specializes in military ship refit, commercial ship repair, upgrade and conversion and shipbuilding. Regional

Education and Training Partners include; Liverpool John Moore's University, Maritime and Engineering College North West (MECNW), Port Academy Liverpool, Wirral Metropolitan College. In March 2016, in collaboration with key partners, Mersey Maritime and Liverpool John Moore's University opened the first phase of the Maritime Knowledge Hub, an ambitious new project to develop a global centre of excellence within the UK for marine and maritime innovation, knowledge and skills. The Liverpool City Region is also home to some of the world's leading logistics , energy, retail and manufacturing operations – ACL, Bibby Group, Cammell Laird, Cargill, CMA CGM, Dong Energy, General Motors, Iberdrola, Ineos, Jaguar Land Rover, Maersk, NSG Pilkington, QVC, Stobart, TJ Morris, Unipart, Unilever.

2. Strengths of the sector. Keys to its success.

The region retains an acknowledged position as a centre for design, engineering, marine equipment and research. A central marine and engineering cluster with easy access to support services classification societies and port state authorities. The regions highly skilled workforce and extensive world class facilities are used to support a broad range of sectors and projects. The region continues to develop its capability in the sector, and is a world leader specialising in military ship refit, commercial ship repair, upgrade and conversion and shipbuilding. The region is further active in the industrial services and energy sector. It has become a hub of the off shore wind industry seeing major investment in its port side infrastructure and facilities. Furthermore the region has recognised the benefits of modular construction and delivery techniques for the nuclear decommissioning sector. In addition it offers services to the off shore oil and gas sector, the petrochemical industry and a wide range sectors requiring the use of engineering and heavy fabrication work. The region is proactively positioning itself as the global thought leader and market leader in key emerging market areas to drive international trade.

3. Weaknesses, difficulties and most relevant problems.

If the region is further successful in bidding for military contracts, the UK's Royal Naval fleet has an historic record of providing a fluctuating source of business. The danger for our region is that our biggest yards become heavily dependent upon military shipbuilding. To be successful, both the shipyards and the supply chain need to develop their global competitiveness for both military and civil work. There is considerable amount of uncertainty as to how the UK's exit from the European Union (Brexit) will turn out, and the implications for the regions heavily trade-exposed Maritime sector. Brexit touches on a number of different economic themes, and increases levels of uncertainty for the Maritime sector. For instance, GDP growth and inflation projections are currently under the spotlight given the slowing UK economy and weaker pound sterling. There is also uncertainty concerning the framework for general UK Government policy. Outside of the EU and the customs union, the UK will be in charge of its own trade policy, which presents both risks and opportunities for trade. Furthermore, outside of the EU's free movement rules the UK would also be fully in charge of migration, meaning that the inflow of EU nationals will likely face some restrictions. The region already has an ageing skills base.

4. Competitiveness level of naval industry companies.

The majority of larger civilian ships are now produced in the Far East on a scale not achievable in the UK. Despite this, there has been a renaissance in regional shipbuilding, which has driven in part by an entrepreneurial attitude towards pursuing opportunities in the commercial market. Recent regional success has included Cammell Laird winning the international competition for the polar research ship. Merseyside is now attracting new investment and new people drawn by this exciting renaissance which makes the Liverpool City Region one of the most attractive UK inward investment locations in which to do business. The £20m Maritime Knowledge Hub is helping to establish a global centre of excellence within the region for marine and maritime innovation, knowledge and skills, which further reinforces the regions position as a centre for design, engineering, marine equipment and research.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The regions sector businesses have a good record of innovation they predict that the principal innovations that will shape the market over the next 10 years will include; Environmental protection and emissions reduction, Autonomous systems, Renewables, Propulsion technology, electronics and data management. The regions industries recognise the importance of R + D + I to develop its strengths and improve its competitive advantage.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The average age of the regions workforce is high and there is a lack of adequately trained young people. The skills gap is one of the biggest challenges facing the regions maritime sector. Its industries work as part of an industry-responsive Skills Alliance with key education and training partners to ensure existing and future workforce has access to the knowledge, education and training programmes needed to keep their business competitive. The region recognises that the training of all employees is paramount to the success and future of its businesses. Many have expanded their training functions and are driving the number of apprenticeships and graduates in their respective organisations.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Yes the sector has historically been a male-dominated industry however, sector businesses are making a concerted effort to help the industry move on from that tradition and to achieve a representation within it that is more in keeping with twenty-first century expectations. The sector has seen an increase in the number of females entering the industry in engineering positions and continues to work with education providers to ensure that the trend continues.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

The regions maritime sector faces a considerable amount of uncertainty over the next few years, much of this comes down to Brexit and the uncertainty it poses for the economy and associated maritime sector. We therefore expect the sector to experience sluggish growth over the next five years. We remain committed to attracting business and investment to the region and supporting those interested in growing and establishing their business here in Merseyside. We are actively seeking to help support and develop our regional shipyards and supply chains to ensure that they are globally competitive for both military and civil work. This will help drive employment and prosperity benefits across the region and to drive international trade.

9. Prospects for the long-term future (more than 10 years).

The Region is one of the fastest growing economies in the UK, with Maritime (under the wider Super port Liverpool umbrella) recognised as one of four key drivers for growth. Major projects are set to transform the region's maritime sector landscape. In addition the UK Governments commitment to growing its Royal Navy Fleet by 2030 is presenting the opportunity to rejuvenate the long term future of our regions ship yards. This brings certainty and the confidence for the regions industries to invest for the long term in its people and its assets, which will help to raise productivity and innovation and improve its competitiveness in the domestic and overseas markets. Many of the trends and uncertainties caused by leaving the EU will be less relevant over the coming years due to the structural impact of Brexit. Outside of the EU and the customs union, the UK will be in charge of its own trade policy, which presents both risks and opportunities for the regions trade. Furthermore, outside of the EU s free movement rules the UK would also be fully in charge of migration.

10. Other comments and contributions not included in the questionnaire. (N/A)

Interview 4: Scottish Maritime Cluster

Douglas Lang – Chairman

Interviewer: Peter Green (National Maritime)

1. Definition of the situation in the naval sector in the region.

The Scottish Maritime Cluster is a representative body for the maritime sector in Scotland. Its aim is to boost economic growth by securing a larger share of the multi-billion dollar global maritime market. Scotland boasts a rich maritime history and today, it is home to the UK's second largest maritime cluster accounting for more than 20% of the UK's total maritime sector. It is where the UK maritime services sector maintains its strongest presence in terms of employment; with the devolved country accounting for one in every four employees. Economic data suggests that the regions maritime sector accounted for 39,300 jobs and made a £3.6 billion contribution to the economy. With a large proportion of employment in the Marine Oil and Gas activities concentrated in Scotland, the Marine industry is the largest constituent industry within the Scottish Maritime sector in terms of economic activity, directly contributing £2.9 billion in GVA and directly supporting around 20,600 jobs in 2015. This compares to £440 million and £200 million in GVA directly contributed by the regions shipping and ports industries respectively. The sector has strong and globally-recognised expertise, based on

outstanding engineering capabilities, highly-skilled people and a drive for innovation, and ship owners have access to a wide range of world-class maritime services and support. Scotland's marine area has an estimated 25% of Europe's offshore wind and tidal resource and 10% of the wave resource. Its major ports offer major deep water harbours and accept the largest vessels in the world for transportation of oil. Shipbuilding accounts for the majority of employment in Scotland with around 87% of all jobs in the sector involved in the building of ships and floating structures. The country has one of the largest shares of employment in the UK shipbuilding and repair sector. Its ship yards are modernising, efficient, productive and competitive. Its yards on the Clyde and on the Forth, are seeing strong growth. These shipyards provide marine shipbuilding, refit, repair and conversion facilities and specialise in military ship refit, commercial ship repair, upgrade and conversion and shipbuilding. Other regional ship yards also provide services for offshore wind, oil and gas, and the petrochemical sector. In addition to military building, regional success has included Ferguson Marine constructing two dual-fuel Caledonian MacBrayne ferries. Scotland has one of the highest concentrations of universities in Europe. Regional sector education and training partners include the Glasgow Nautical College, part of the City of Glasgow College, and Strathclyde University, which has the world's foremost naval architecture department. The European Marine Energy Centre, the UKAS accredited test and research centre focuses on wave and tidal power development is also based in the region.

2. Strengths of the sector. Keys to its success.

The region retains an acknowledged position as a centre for design, engineering, marine equipment and research. Its ship yards are modernising, efficient, productive and competitive and have access to highly-skilled people. Its ports offer a range of infrastructure, facilities, skills and supply chain to support shipbuilding and ship repair as well as renewables, oil and gas, decommissioning and subsea industries. It is home of Europe's leading energy hub with £200 million of public funds available to support renewable energy projects and businesses have access to 2,000 supply chain companies employing 200,000 staff. It is also a global centre for offshore energy and is home to the European Marine Energy Centre (EMEC). It has a globally respected oil and gas industry, cemented by decades of experience. The region has the highest educational attainment in the UK and the highest concentration of universities in Europe, giving greater access to a skilled workforce.

3. Weaknesses, difficulties and most relevant problems.

To expand globally the sector needs a growth strategy which extends beyond reliance on MoD contracts. The UK's Royal Naval fleet has an historic record of providing a fluctuating source of business. The danger for the region is that the biggest yards become heavily dependent upon military shipbuilding. To be successful, both the shipyards and the supply chain need to develop their global competitiveness for both military and civil work. There is a considerable amount of uncertainty as to how the UK's exit from the European Union (Brexit) will turn out, and the implications for the heavily trade-exposed Maritime sector. Brexit touches on a number of different economic themes, and increases levels of uncertainty for the Maritime sector. There is also uncertainty concerning the framework for general UK Government policy.

4. Competitiveness level of naval industry companies.

The aim is to boost economic growth by securing a larger share of the multi-billion dollar global maritime market. The majority of larger merchant ships are now produced in the Far East on a scale not achievable in the UK. Despite this, there has been a renaissance in the regions shipbuilding. Its ports and shipyards offer a range of infrastructure, facilities, skills and supply chain to support shipbuilding, ship repair, renewables, oil and gas, commercial fishing, decommissioning and subsea industries. Recent regional success include; Ferguson Marine who are constructing two dual-fuel Caledonian MacBrayne ferries. The region has strong and globally-recognised expertise, based on outstanding engineering capabilities and access to highly-skilled people.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Our regions world class innovation Centre's bring together leaders in industry and academia. The Energy Technology Partnership (ETP) is the largest and most broad-based energy research partnership in Europe, comprising 600 researchers across 13 universities. The region is the UK's leading region for investment in higher education R&D. The region is the UK's most successful region for university spinouts. This allows the regions sector businesses to develop a good record of innovation and to recognise the importance of R + D + I to develop its strengths and improve its competitive advantage.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

As with other regions the average age of its workforce is high and there is a lack of adequately trained young people. The skills gap is one of the biggest challenges facing the regions maritime sector. Its industries work with key education and training partners to ensure existing and future workforce has access to the knowledge, education and training programmes needed to keep their business competitive. The region recognises that the training of all employees is paramount to the success and future of its businesses. Many have expanded their training functions and are driving the number of apprenticeships and graduates in their respective organisations.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Yes the sector has historically been a male-dominated industry however, sector businesses are making a concerted effort to help the industry move on from that tradition and to achieve a representation within it that is more in keeping with twenty-first century expectations. The sector has seen an increase in the number of females entering the industry in engineering positions and continues to work with education providers to ensure that the trend continues.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

Brexit causes uncertainty for the region's economy and associated maritime sector. We expect the sector to experience sluggish growth over the next five years. We will continue to work with partners

to promote and attract business and investment to the region, and support those interested in growing and establishing their business in the region. Our focus will also be to support our regional shipyards and to develop supply chains to ensure that they are globally competitive for both military and civil work. This will continue to drive employment and prosperity benefits across the region and increase international trade.

9. Prospects for the long-term future (more than 10 years).

The UK Governments commitment to growing its Royal Navy Fleet by 2030 is presenting the opportunity to rejuvenate the long term future of the regions ship yards. This brings certainty and the confidence for the regions industries to invest for the long term in its people and its assets, which will help to raise productivity and innovation and improve its competitiveness in the domestic and overseas markets. We will continue to support regional shipyards and work with them to develop supply chains to ensure that they remain globally competitive for both military and civil work. We will work closely with the ship yards and ports sector to develop a range of infrastructure, facilities, skills and supply chain that best supports shipbuilding, ship repair, renewables, oil and gas, commercial fishing, decommissioning and subsea industries amongst others. Many of the trends and uncertainties caused by leaving the EU will be less relevant over the coming years due to the structural impact of Brexit.

10. Other comments and contributions not included in the questionnaire. (N/A)

Southern and Eastern Region, Ireland Interview Transcripts

Interview 1: Enterprise Ireland

Liam Curran, Senior Technologist (Marine)

Date: April 12th, 2018.
Time: 10:00
Place: Telephone
Interviewer: Eileen Crowley (Cork Institute of Technology)

1. Definition of the situation in the naval sector in the region.

The sector in Ireland is small and limited. Geographically it occurs in small, isolated and dispersed communities around the coast such as Arklow, Co. Wicklow and Killybegs, Co.Donegal. As such, though small, it is a critical source of employment in these locations.

Ireland is not hugely different from most of western Europe in so far as there are no big general ship builders left. These types of ships, are built mostly in Asia, S Korea & China. Western Europe is home

to more specialised ship building businesses such as research and support vessels for the hydrocarbon or military sectors. Vessels in excess of 60 m are not built in Ireland. We tend to build vessels such as those suited to fishing. A small car ferry has also been built in Ireland. In general however we have limited capabilities in this space. It is simply not competitive here to do that type of work. It is labour intensive and needs a particular skillset as well as large-scale infrastructure, which Ireland no longer offers. There is some of this large-scale infrastructure available in Belfast docks but even there ship-building has ceased and the focus is more on activities such as wind turbine construction.

Ireland has some excellent capabilities around the fitting-out of fishing vessels especially for the pelagic fleet. Businesses in Killybegs can provide a full fit-out service for boats, including the provision of smart equipment and technology e.g. cranes, deck winches, net equipment, bridge, radios, communication equipment. An entire end to end, boat fit-out service can be provided by companies in Killybegs. Companies here service ships brought in from areas such as Norway and Scotland as well as from Arklow. Barry Electronics provides all the communications equipment needs of the vessel including sensors.

The Socio Economic Marine Institute (SEMRU) produces a report entitled Ireland's Ocean Economy, every three years and this provides more detail on all areas of the blue economy.

2. Strengths of the sector. Keys to its success.

A particular example of a strength in the sector can be seen in Killbegs and the ability of companies there to provide a complete fit-out service for a fishing vessel in one locality.

Other strengths include the capabilities and flexibility of the sector. Cutting-edge technologies are employed by businesses in this area. Businesses are also beginning to engage a little with the IoT world, particularly around the area of net sensors, which represents an interesting link between national ICT capabilities and mainstream maritime industry.

There is also a company working on using drone technology to deploy assets to manage search and rescue operations https://dronesarpilot.com/ and to deploy video feedback to the rescue services from drones out at sea. We have good national IoT and ICT capabilities and we need to maximise and optimise that for the marine and maritime sector.

We have a flexible SME base in the sector, which is quite innovative. This is a sector of industry for which innovation is critical. However, companies have no national smart specialisation vision to follow for the sector and operate in a rather ad hoc fashion.

We have strong national research capability with MAREI and NMCI. However, we lack a national big picture vision of what markets the sector should be chasing.

3. Weaknesses, difficulties and most relevant problems.

Some serious infrastructural deficits exist which prevent the industry from harnessing the potential of the sector. In Killybegs for example the absence of a dry dock big enough to handle large vessels, over 60m in length, for fit-out, means that all of these vessels go to the UK or Spain since we can't offer a yard big enough to handle them.

Greater integration is necessary between the IoT/ICT and the maritime sectors to drive opportunities, which exist in this area such as using ICT to track vessels as well as growing opportunities in the autonomous vessels space.

An in depth analysis of our strengths and areas of competitive advantage within the maritime sector is essential in order to build a national smart specialisation vision of the sector so that SMEs can focus efforts on areas with most growth and return potential in order to optimise their strengths in the sector.

One the greatest weaknesses in the sector relates to a lack of identification between society and the maritime sector. In general, the Irish citizen does not identify with Ireland as a maritime nation. As a result, Ireland is often, not recognised as having strong maritime capabilities and it is hard for businesses to sell their strengths in the maritime sector outside of Ireland.

Ireland identifies itself however as an agricultural nation. Trying to develop the sector from this basis where there is a total disconnect between the people and the sea is extremely difficult. A lot of work needs to be done in order to develop and instil a sense of our national maritime identity so that the growth of the sector can be supported from the bottom up.

Ireland's maritime sector contributes 0.9% to its GDP while the corresponding figure for the EU is 2.4%. A Marine Development Team was established in 2016, involving major development agencies of the state, including Enterprise Ireland, in an integrated inter agency based approach to delivering further development of the blue economy. It should be noted however that the blue economy is a huge sector. Perhaps the creation of sub sectoral networks including one to represent the maritime economy might be useful. Nevertheless, the Marine Development Team is only in its infancy and perhaps this will happen in the future.

A considerable problem or threat exists in the fact that there are a large number of skilled operators with assets in Scotland and Norway, which have experience in working in the offshore oil and gas industry now looking for new opportunities in ocean based renewable energy (ocean, wave, tidal etc.) Unless Ireland takes the necessary steps, there is a possibility that they will take the lead in this sector since they already have the large vessels and capable crews. This is a significant area of opportunity for Ireland, with plenty of potential off our coasts. This needs to actively harnessed and all necessary steps taken to secure this opportunity for our native capabilities and assets.

4. Competitiveness level of naval industry companies.

In terms of the countries active niche areas, the sector is very competitive. This is proven in the fact that businesses in Killybegs are well able to compete with corresponding industries elsewhere to attract Norwegian and Scottish boats for fit-out service to their location because they can provide a

competitive service. Shipbuilding however will never be competitive in Ireland. Our competitiveness is in areas higher up the value chain.

The development of a targeted smart specialisation strategy for the sector would greatly help our competitiveness going forward.

In 2017 the Irish Marine Development Office commissioned the creation of a new brand and suite of assets for the marine sector in Ireland. The result was a brand entitled 'Your Blue Edge'. This single brand image representing Ireland should help our competitiveness, however a significant amount of work remains to be done in terms of improving integration between our maritime identity and our population.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Ireland has some excellent national infrastructure in this respect. Examples include:

- *The LIR Lir National Ocean Test Facility in Cork which consists of state of the art wave tanks and electrical rigs that allow for scaled testing in a controlled environment.*
- *The Marine & Renewable Energy Test Site in Galway Bay - a national test and demonstration facility including 1/4-scale ocean energy test site for marine energy and technology.*
- *The Atlantic Marine Energy Test Site (AMETS) in Mayo – which can facilitate testing of full scale wave energy converters in an open ocean environment.*

Moreover, Science Foundation Ireland, have invested heavily in R&D relating to marine renewables and Enterprise Ireland also supports individual companies in that sector. Our active niche areas such as fit-out businesses are also innovative. A company called CATHX OCEAN for example has developed a disruptive technology relating to pipeline inspection for the oil and gas industry.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

Unable to comment.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Unable to comment.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

The prospects for our active niche areas are quite good. For those companies manufacturing a standard unspecialised product the prospects are less hopeful. Increased and closer integration between the ICT and marine sectors (autonomous shipping, navigation etc) will ensure we are positioned to take advantage of short term economic opportunities, particularly in the area of

autonomous control vessels – (advantage being you don't have major crew demand for standard crew vessels) There is great opportunity in this area.

One Irish company is already benefitting from this, XOCEAN have developed an autonomous surface vessel and are getting a lot of traction from the oil and gas industry who will use the technology in order to study decommissioned wells in the North sea.

Increasing and greater integration between ICT and Marine in areas in which we are already strong will be essential if we are to take advantage of the short-term prospects for the sector.

9. Prospects for the long-term future (more than 10 years).

There is likely to be major potential for the sector in off-shore renewables in the long term. The west coast of Ireland represents a major resource in this regard. In order to harness this potential it is critical that we develop the capabilities to exploit this resource in areas such as building and deploying floating wind turbines and improved grid connections. Ireland has the potential to become a major energy exporter in the long term if we can harness these opportunities.

10. Other comments and contributions not included in the questionnaire. (N/A)

Interview 2: Mainport Group

Dave Ronayne, Chief Executive, The Mainport Group

Date: April 9th, 2018.
Time: 10:30
Place: Mainport Group, Cork
Interviewer: Eileen Crowley (Cork Institute of Technology)

1. Definition of the situation in the naval sector in the region.

The current market in Ireland for Mainport operations is extremely small and limited, with only one off shore oil site in the entire country for example, thus Mainport operates globally. Nevertheless the company can run all operations from its Cork base, thanks in part to the excellent availability of high speed broadband.

The entire maritime economy has huge untapped potential in Ireland. The direct economic value of Ireland's marine economy in 2016 was approximately 0.9% of GDP. The corresponding figure for Singapore was 7%.

As an island nation, maritime activities including shipping and trade are vital to our everyday activities, to our survival and to our prosperity. Its growth and development depends on the support and understanding of actors from across the quadruple helix.

The importance and relevance of maritime activities to the everyday life of the Irish resident and to our socio economic growth and development however, are not understood or visible to the citizen, to the public sector or indeed to many in academia. Neither is there an understanding of the challenges, which businesses operating within this sector face. A huge proportion of our goods and items have arrived in our country by sea. Many of our jobs and industries in Ireland are reliant on the smooth functioning of a competitive maritime economy. Yet its growth and development continually faces challenges and barriers since people do not see the connections between this sector and the things they take for granted in their everyday lives.

There is a major communication, collaboration and outreach gap in this sense, which needs to be filled and improved if the potential of the maritime economy is to be harnessed in Ireland. This is a crucial first step. The maritime sector currently operates in a vacuum, disconnected from key stakeholders within its ecosystem. Moreover businesses and actors within this sector are a very disparate group, operating relatively independently and in an ad hoc fashion.

The sector needs a champion to develop and lead a unified and integrated strategy for the development of the sector, to represent and give voice to the sector, to strengthen connections across the ecosystem and to ensure improved visibility and understanding of the sector by all citizens across the quadruple helix.

2. Strengths of the sector. Keys to its success.

The Mainport Group are running a very successful company with global operations from their base in Cork. It has operations in the Gulf of Mexico, the North Sea and Turkey to mention but a few locations. Their ability to run these operations from their Cork base is considered a major strength. This is thanks to the availability of a high-speed broadband connection and access to an airport with direct flights to major hubs such as London and Amsterdam with global flight connections. Moreover the company has access to competent professional staff emerging from the locally based National Maritime College of Ireland (NMCI).

Ireland's well established, reliable, high safety record in maritime activities, as well as our high standards in marine regulations is also a strong point giving companies like Mainport a positive reputation globally.

Ireland's relative political stability is also a strong point.

3. Weaknesses, difficulties and most relevant problems.

The Irish market is small and limited. There is potential for growth here if the issues mentioned in the introduction can be addressed, through a champion or cluster type organisation similar for example

to the IFA for the agricultural sector. Collaboration between businesses within the sector and other actors within the ecosystem needs to be improved.

Financing for the industry is difficult to find in Ireland, it is necessary to look to London and Europe for ship financing.

The environment is extremely difficult for start-ups in the first two years of business. The public sector and academia are completely disconnected from the reality of the difficulties facing start-ups in terms of surviving, growing and developing. Moreover, there are very few start-ups in the maritime sector relative to other sectors. Previous attempts at developing a maritime cluster in Cork broke down and lacked sufficient engagement between industry, the public sector and academia. Instead, they operated almost in a parallel universe. Greater collaboration and engagement is necessary here.

4. Competitiveness level of naval industry companies.

Ireland currently cannot compete with Asia in ship-building because their labour costs are so low. Businesses in Ireland need to move up the value chain since we have more scope to compete in higher value products within global markets. We need greater engagement and support from government and the public sector in terms of addressing the competitiveness of and growing the contribution of the sector to the Irish economy. The state have to take a lead but is currently indifferent. On the positive side, Ireland has a very good tonnage tax regime, considered the best in Europe. This is a method for determining taxable income and positively affects the ability of shipping operators to attract and retain staff.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The Mainport Group do not have a dedicated R&D department, however they continue to monitor innovation and development occurring within their competitor companies and strive to keep up with these developments.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The NMCI provides an excellent stream of highly competent professionals for the industry.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

There are very few females working at sea. The Mainport Group has no females or people with disabilities working on ships. There are no females occupying senior management roles within the company. The sector is male dominated. There are a small number of second generation females within the sector.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

Continued operations within the fertilizer and animal foodstuffs area, since this is a busy operation in Cork. Cork used to be a busy port for timber imports but this stopped when the recession hit. Perhaps that will come back in the short term as housing construction grows. Continued operations within off-shore oil, base management. They currently provide base management services for Providence.

9. Prospects for the long-term future (more than 10 years).

Increase base management services provision should the off shore oil exploration market increase in Ireland. Growing seismic support service. Continued stevedoring and ship agency services. Develop investment in maritime start-ups.

10. Other comments and contributions not included in the questionnaire. (N/A)

Interview 3: Marine Development Team

Mark White, Manager, Marine Development Team

Date: April 20th, 2018.
Time: 09:30
Place: Telephone
Interviewer: Eileen Crowley (Cork Institute of Technology)

1. Definition of the situation in the naval sector in the region.

The marine supplies sector is a small sector in the Irish economy, consisting mainly of SMEs clustered in small remote coastal locations such as Killybegs in Co. Dongela. Killybegs is a fascinating example of this sector in Ireland. The engineering workshops are located about 100 yards outside the town. Businesses there are frustrated from the lack of support received from some parts of the government. A small percentage of the work carried out by the businesses in Killybegs is done for local boat owners but most of their business comes from clients from around Ireland and outside of Ireland. Companies like EK Marine and SeaQuest for example are exporting to Norway, Denmark and elsewhere yet they are largely unheard of in Ireland.

While the sector is relatively small in Ireland there are centres of excellence like Killybegs scattered around the coast. The sector is quite fragmented in Ireland with three relatively significant builders including Mooney boats, Arklow Marine and Safehaven Marine (based in Youghal). These builders create pilot boats and harbour launches and have very sophisticated interceptor craft such as 'Thunderchild'.

2. Strengths of the sector. Keys to its success.

The ingenuity of the businesses who have had to work hard to survive in a tough environment is the biggest strength of the sector in Ireland. Some businesses are involved in very innovative marine constructions, for example Eire Composites who recently won a H2020 SME grant. There are people doing innovative and ingenious things in order to stay in business.

At the same time there are decisions made which show no support to these businesses such as the closing of the dry dock in Dublin, in order to use the land for parking and storage, which had been an operating base for Arklow Shipping employing 30-40 people. This decision was made probably for reasonable commercial cause however it showed poor national and strategic support for the marine sector and SMEs operating in the area.

3. Weaknesses, difficulties and most relevant problems.

The small size of the sector, lack of critical mass and lack of strategic support, as well as lack of understanding of the strategic importance of the sector to Ireland as a whole, can be considered major weaknesses. Ireland needs a level of marine transport independence yet there is no strategic support or understand of this, neither at government or citizen level.

4. Competitiveness level of naval industry companies.

There is almost no internal competition in Ireland. A small amount exists for pilot boats between and for small fishing trawlers but it is almost non-existent. Most business in the larger vessel suppliers comes from international ship owners. Irish business therefore compete often with businesses from southern UK and other European businesses.

Most of the businesses in Ireland certainly in the clusters of Killybegs and Arklow are different enough from each other that their products are minimally competitive with each other.

Business in the marine supplies sector in Ireland are relatively competitive on an international scale. Arklow Marine built a very fine (RORO) ferry for the Northern Ireland government, which they won through an EU wide tender. Business in Ireland have developed to compete on an international scale doing things for example buying the hulls from areas where labour is cheaper and fitting them out in Ireland or with Irish companies.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The sector reveals a mixed story in this regard. The bulk of the value to the economy comes from standard, traditional boat supplies. However there are many things happening that have the potential to change that, in the current climate. The 'Thunderchild' interceptor vessel, a sleek and powerful boat, for example was, created with significant assistance from Enterprise Ireland. It was, designed for use by the customs services for quick interception of boats and created with quite innovative and radical thinking.

Eire Composites is another example of a business reliant on technological innovation and R&D. It recently received EU funding to commercialise some of their technological innovations with the intention of using them in the ship building market. W1DA is another company in this space and are collaborating with Eire Composites in the building of a really radical new type of sail boat, which will be powered by renewables.

A group in the University of Limerick called I-Comp, was funded by Science Foundation Ireland and focuses on composite materials and its use in larger boat building.

So while there are pockets of highly innovative activity within businesses in Ireland and some SMEs reliant on this type of activity, Ireland does not have an industry big enough to get into innovation in some of the other areas like engine drives or propellers but there is some significant innovation ongoing nevertheless.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

Businesses have major difficulties in sourcing the right type of staff for their companies in this sector and report it as a major issue. In general they are looking for boat builders, fabricators welders fitters, electricians and plumbers who have experience in the maritime sector. However with very few of these businesses in Ireland in this sector there are very few opportunities for apprentices to gain experience in the field or indeed awareness among apprentices of opportunities in the sector.

There is a resultant lack in skilled employees with an understanding of the requirements of the maritime sector, which is a significant difficulty for businesses. Moreover there is a wide spreading view amongst the population, young people and their parents, that a university degree and/or profession is far preferable to an apprenticeship in a trade. Work needs to be done in order to change this perception. It is also recognised that it is very difficult to create training opportunities for a sector where there are few jobs.

NMCI has a very important role to play in this area particularly in producing marine engineers. There may be an opportunity for NMCI to consider in offering some additional skills training in this area.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

This is a very, male dominated sector, involving hard physical activity and long periods of time spent at sea. There are some examples of females who have broken glass ceilings in this sector such as Yvonne Shields, CEO of Irish Lights. Overall however it is dominated by physically, able-bodied males.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

Support from the state will be essential to the health of the sector in the short and long term. Businesses will need state support in order to enable them to innovate in order to meet the current and future demands of the sector. Other sectors have been very successful in receiving major state support such as med-tech and IT. In Ireland the industrial support mechanisms have not traditionally supported the marine sector however. This has to change in order for the sector to grow. There has to be greater openness to supporting marine business possibilities – sincere there are people with great ideas and plenty of opportunity to be exploited within the sector.

There is plenty of opportunity within Ireland in the future for the leisure boat sector and commercial shipping sector such as pilot boats, small island ferries, specialist craft etc. However Ireland is unlikely to ever develop a bulk carrier ship building industry.

9. Prospects for the long-term future (more than 10 years).

The long terms opportunities depend on the government supporting the short to medium term opportunities within the sector.

10. Other comments and contributions not included in the questionnaire. (N/A)

Interview 4: Port of Cork

Paul O'Regan, Harbour Master, Port of Cork

Date: April 30th, 2018.
Time: 14:00
Place: Telephone
Interviewer: Eileen Crowley (Cork Institute of Technology)

1. Definition of the situation in the naval sector in the region.

The sector in Ireland is extremely small and limited to fishing trawlers and small ferries with no large ship activity. Nevertheless it is a necessary and very important sector, not only to the local communities which it supports but for the self-sufficiency and security of the country.

Outside of Ireland nearly every ship yard in the world is full. There has been a shift towards large shipping companies taking ownership of shipyards as they can't find space in those owned by private companies and individuals, which once, but no longer have spare capacity. There are multiple mega ships being built at present. In order to guarantee supply the shipping companies have had to make this move towards investing in the ownership and control of shipyards.

The Meyer Werft yard in Germany for example was just bought by Crystal cruise ships. The future impact of such activity may be that the smaller players will be squeezed out. They will have to wait a longer period of time for ship yard use, the cost of which will rise and this ultimately may lead to an aging fleet.

SMEs operating in the supply chain should still be very busy. Fishing boats and small ferries are being displaced as a result of the growth in mega ships and change in ownership of shipyards. This may well result in an uplift in the smaller yards in Ireland, if they are capable of building these and meeting the demand.

2. Strengths of the sector. Keys to its success.

Because of the small size of the sector in Ireland it is difficult for new entrants to break into, ensuring greater client and security for current operators.

This may or may not be considered a weakness in terms of innovation since new operators entering the market will be dependent on whether or not they are developing a product which meets a current need in the sector and consequently their level of innovation.

3. Weaknesses, difficulties and most relevant problems.

The small size and scale of the sector in Ireland can be considered a weakness. The Irish sector SMEs are limited to working with small craft. Moreover all raw materials for the sector have to be imported such as steel etc. Labour costs in Ireland are high relative to other areas. While highly skilled workers are available they are not available in large numbers and skilled workers often have to be sought from outside of Ireland. For example when Liebherr were building cranes in Cork dockyard they had to source skilled workers from Poland.

4. Competitiveness level of naval industry companies.

Unable to comment.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Innovation and R&D is essential in this sector. This was traditionally a heavy industry, but it is evolving very much so into a cutting edge, innovative, high-tech and environmentally friendly sector. The future of the sector is increasingly rooted in technological innovation and R&D related activity.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

There are a mix of skills levels in the sector. It takes a long time to build up the resources and reserves of these range of skills in a society particularly when they have been depleted as result of a declining sector in recent decades. The sector became unattractive due to its decline and lack of employment opportunities. This resulted in a skills shortage over time which the sector is still battling with and thus we see the need to import foreign labour for some specialised roles.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

Unable to comment in this regard.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

The sector will probably manage quite well. Its order books will be good it will build up its skill set and resources and will continue to innovate to meet market demand.

9. Prospects for the long-term future (more than 10 years).

The long-term prospects will rely on the work and progress made in the short term. The foundations which the sector lays down now in terms of its skills, resources and ability to innovative will be critical for its future growth and success. Legislation is changing in favour of a much more modern design in ship-building to incorporate increased energy efficiency, requiring specialist skills and knowledge relating to, for example, LNG powered vessels, vessels with a lower drag etc. Irish SMEs have opportunities in all of these areas if the industry prepares itself, adapts and develops in the short term.

Interview 5: Barry Electronics

Chris Joyce, Director, Barry Electronics

Date: April 18th, 2018.
Time: 11:00
Place: Telephone
Interviewer: Eileen Crowley (Cork Institute of Technology)

1. Definition of the situation in the naval sector in the region.

The sector is considered minimal in Ireland but it is of major importance to those operating within it. Barry Electronics is based near the town of Killybegs for example with a population of approximately 2,000 people. The sector is of crucial importance to the people of the town. However it is of such a small scale that it effects little or no political influence, which is reflected in the little weight it holds in terms of strategic importance to the country.

The lack of a dry dock in the town for example means that the area and businesses in the marine sector there are unable to access a large amount of fit out and finishing business which could be provided in Killybegs. Instead staff from Barry Electronics for examples spend several months at a time in locations such as Denmark fitting out larger boats and contributing to and benefiting the local economy there. Should a dry dock be made available in Killybegs it would not only benefit local businesses in the marine sector but the entire socio-economic ecosystem of the region.

2. Strengths of the sector. Keys to its success.

A significant strength is the expertise of the people and the can do, positive attitude of the businesses as well as their 24/7 commitment to their work. A further strength is the strong sense of co-operation and support between businesses in the sector, particularly within clusters such as Killybegs.

When a project comes along businesses pull together in order to share work and deliver a full start to finish service for the boat owner. While there is no formal agreement which has enabled this to happen the businesses work well together organically and there is a common understanding between all of them. The businesses cooperate to service large & complex contracts and thus each business benefits from that.

Unlike other locations offering boat maintenance and repair businesses can offer boat owners everything they need in one location. They provide an efficient and expert service from beginning to

end, all in one location. This is their unique selling point and certainly a strength of the sector in Killybegs.

3. Weaknesses, difficulties and most relevant problems.

Poor infrastructural support is considered a major constraint for the sector in Killybegs.

The lack of a dry dock, which would allow the businesses to supply a service to larger boats over 24m is a major weakness and constraint for the sector and for the entire regional economy. Moreover the lack of high speed broadband to the businesses in Killybegs is a further problem. While broadband fibre is passing through the area where the businesses are located in Killybegs they are unable to secure a connection to it under the Rural Broadband Scheme since the businesses are located within a 50km per hour speed limit and thus not considered a rural area and not qualifying for connection to the broadband fibre. The business survive on a rather inadequate ADSL connection, providing a 3-4M broadband service.

The sector's lack of lobbying power is a further weakness in this regard. Businesses are currently battling a proposal to turn land near the pier where they operate currently designated as suitable for future harbour use, into an area designated as high amenity visibility within the revised development plan for the area. Business are working towards improving their political connections and influence but individually they have little time to devote to this type of work, since they are pressed with the day to day running of their businesses.

Another weakness of the sector in Ireland can be attributed to the lack of speed with which ideas can be brought to fruition in Ireland relative to other countries. In Denmark for example ideas can pass through the political system and be implemented far more quickly than is possible in Ireland.

There is a lack of government support for SMEs in the marine sector in Ireland. While organisations such as Enterprise Ireland may be of benefit to larger companies SMEs often find that tackling the paperwork which comes with engagement with these organisations to be so time consuming that it is prohibitive for companies of their size and with their level of resourcing.

A further challenge for the sector is the ability to attract the right staff. The often, remote location of businesses and the need to often spend long periods of time at sea can often prove unattractive for workers. The result is that businesses often find it difficult to source the right staff. As a result Barry Electronics are trying to grow business in areas where they can service on board IT equipment through remote access.

4. Competitiveness level of naval industry companies.

Businesses within the Irish marine sector are very capable of competing at an international scale. Irish companies are competing with other EU companies and winning contracts for services on a regular basis. Labour in the marine sector in Ireland is cheaper than in many other western European countries.

A strong work ethic exists in the Irish marine sector as well as a highly skilled and knowledgeable workforce and this positively affects our ability to compete.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

The ability to continually innovate is crucial to the survival and success of Barry Electronics as well as to other SMEs in the Irish marine sector. While Barry Electronics do not have a dedicated in-house R&D team they are constantly collaborating with suppliers to drive product innovation.

Their location on the western seaboard means they have the ideal location to develop products which can withstand the worst of the ocean elements.

The growth in the development, sale and use of sensors offers a major potential area of future growth since they provide a world of data, which can be harvested and analysed for social, economic & environmental gain.

The Barry Electronics team who have worked with Letterkenny Institute of Technology and MAREI in the past, is always learning and adapting to new requirements and new technology which is rapidly changing, they see this ability to continually adapt as key to their survival.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

Most of the staff in Barry Electronics are educated to degree level and engage in upskilling on an annual basis in order to remain up to date on the latest knowledge and skills necessary for the sector. Since many of the companies operating in the sector are small businesses employees need to be willing and able to carry out a broad range of tasks.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

The sector is generally very, male dominated. Strong physical ability is often required. Barry Electronics has an all-male staff outside in roles outside of administration.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

If a hard BREXIT border is imposed it will shut Killybegs off from a lot of fishing locations on which they currently rely for business. This will have a major impact. Nevertheless investment in new vessels is continuing and businesses feel positive in this respect. Businesses in Killybegs offer an excellent standard of service and their reputation is known throughout Europe. This will stand to the sector in the short term.

Businesses in the sector intend to focus on their strengths and to build on these in the short terms. They also intend to become more organised and to grow their political influence for the benefit of the sector as a whole.

9. Prospects for the long-term future (more than 10 years).

Businesses hope for the development of a dry dock in Killybegs, which would enable them to service larger boats with consequent positive economic impact for the entire sector and region. Businesses in the sector have seen a slow and steady growth curve since the 1980s and they expect that this will continue if the appropriate infrastructure and support is provided.

10. Other comments and contributions not included in the questionnaire. (N/A)

Bretagne Region, France Interview Transcripts

Interview 1: MRE cluster BPN

Jacques Dubost, President, MRE cluster BPN

Date: May 16th, 2018.
Place: Survey
Interviewer: Lise Hermite (Bretagne Pole Naval)

1. Definition of the situation in the naval sector in the region.

The naval sector is developing in the region and has a low weight in terms of the regional economy.

2. Strengths of the sector. Keys to its success.

The strengths of the sector relate to 1 diversity of products / 2 expertise of the workforce / 3 geographical location of the region.

3. Weaknesses, difficulties and most relevant problems.

The loss of skills is a key factor, the lack of resources might put in danger all the profession.

Also, the lack of vision to approach another sector as the MRE is a handicap, the highest level of the French state should take fast measures to fix this diversification which might be springboards for the Breton shipbuilding and ship repair.

4. Competitiveness level of naval industry companies.

Just like in the new shipbuilding, it is important that the ship repair progress according to the new technologies by constantly adapting to the development of the MCO with the use of new virtual reality processing technologies.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Technological innovation has a real impact on the shipbuilding and the ship repair survival.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The problem of the loss of expertise, particularly by the turnover due to asbestos regulations, puts production jobs at risk. Also, we must take into account the lack of attractiveness of naval professions, which today have a negative image with young people just like the industry, even if the naval is slightly less impacted.

The shipbuilding and ship repair will have to face severe competition from the so-called emerging countries and this as well in the design as in the shipbuilding and ship repair, working passengers, fishing etc. In order to develop the sector more 1/ trainings navalisation / 2 apprenticeship / 3 more multi-talented and multi-skiles profiles / 4 strengthen the practice of the English language are required.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

I do not believe there are equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

See question 9 below.

9. Prospects for the long-term future (more than 10 years).

We can envisage stability over the next 10 years, a stability that can only be maintained if we question the methods of design and construction, as well as the "hunt in pack" offensive. Competitive commercial approach driven by innovation, especially in propulsion modes, compliance with standards (eg. LNG, decarbonisation.).

10. Other comments and contributions not included in the questionnaire.

It seems to me important to work now on several axes:

1 development of an offensive "commercial and marketing" approach to highlight acquired know-how and new products

2 focus more on related markets such as the development of the RME sector which could be a vector of load plan for the naval fleet, for example the construction of a new generation ship allowing the maintenance of the wind farms, but also the development of a maritime tourism from ship "supply"

3 the reinforcement and the maintenance of the staff skills as well in design as in production, it takes many years to be fully operational because many trades especially in production learn by the gesture (ex the boilermakers, the welders, the carpenters etc ...)

4 faster entry of new technologies into design modes (3D printer, point cloud, virtual reality, etc. ... well beyond the CAO or GPAO currently present in our companies)

Interview 2: Campus of Business & Qualifications of the Brittany Sea Industry

Martine Jousset, Operations Director (CMQ INDMER).

Date: May 15th, 2018.
Place: Survey
Interviewer: Lise Hermite (Bretagne Pole Naval)

1. Definition of the situation in the naval sector in the region.

The naval sector is developing in the region and has a low weight in terms of the regional economy.

2. Strengths of the sector. Keys to its success.

The strengths of the sector relate to 1 presence of infrastructures / 2 geographical location / 3 expertise of the work force / 4 quality

Maritime DNA for France is strongly supported by BRITTANY, whose coastline is the largest in France. The geographical situation is thus, one of the asset of the development of the naval activity.

3. Weaknesses, difficulties and most relevant problems.

In my opinion, there is a too big gap between the economic actors and especially between the big groups like Naval Group, STX, etc… and the SMEs which nevertheless represent the majority of the activity in terms of jobs..

4. Competitiveness level of naval industry companies.

Regarding the ship repair, Brittany capitalizes on the very big contracts obtained in the last 3 years and in particular by the defences export contracts of Naval Group.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Technological engineering and industrial innovation has a medium impact on the shipbuilding and the ship repair survival.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The CMQ INDMER, which I represent in my capacity as operational director, is an entity supported by the region and the Ministry of Education / Research. The role of the CMQ INDMER is to federate training structures and organizations in the regions and to set up bridges between the academic world (training, school, research) and the economic world (companies, clusters etc.). In order to develop the sector more 1/ multi-talented and multi-skilled profiles 2/ navalisation specialization 3/ strengthening the practice of the English language are required.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

I do not believe there are equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

I regret to have to show a relative pessimism with a stability for the next 5 years, but the positioning of CAMPUS and in particular the CMQ INDMER requires a stronger awareness that will help to change the levels of skills. Competences essential to the competitiveness of the companies of the activity.

9. Prospects for the long-term future (more than 10 years).

Not Answered.

10. Other comments and contributions not included in the questionnaire.

The naval sector is no longer at local and regional level but at least at European level. Collective actions in favor of skills development have to be worked on the basis of partnership at the European level and in particular with neighboring countries (Spain / Italy / etc.).

Interview 3: Company 3

Patrice Le Fel, President, Port of Lorient.

Date: May 17th, 2018.
Place: Survey
Interviewer: Lise Hermite (Bretagne Pole Naval)

1. Definition of the situation in the naval sector in the region.

I don't believe there has been any significant evolution of the naval sector in the region over the past 5 years.

2. Strengths of the sector. Keys to its success.

The strengths of the sector relate to 1 infrastructures / 2 geographical location / 3 innovation

Competitiveness is regional, awareness has been raised in recent years and collective groups are essential (IPL / IPC / IBS / IPOC) regional players federating within BPN to carry out lobbying actions towards the authorities in charge, and in particular the regional council of Brittany which is the owner of the majority of the infrastructures the competitiveness of the naval sector is closely linked to the capacity to form important groups allowing the economy to position itself as rank 1 in a landscape where competition is not only regional but also national and international.

3. Weaknesses, difficulties and most relevant problems.

In my opinion, obviously the loss of competence is the first problem of the sector (asbestos).

4. Competitiveness level of naval industry companies.

Regarding ship repair, hope is allowed to the absolute condition of obtaining level and capacity skills (many trades are in tension and loss of know-how could endanger the very specific activity of French ship repair).

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Technological engineering innovation is extremely important, whilst industrial innovation has a medium impact on the shipbuilding and the ship repair survival.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

Federated companies within the IPL represent a force of around 950 jobs in the Lorient sector. All "industrial" professions are therefore widely represented and are all essential to the competitiveness of the local economy. In order to develop the sector more 1 / Minimum basic training required / 2 navalisation of training / 3 apprenticeship / 4 more multi-talented and multi-skilled profiles / 5 Strengthening the practice of the English language are required.

Need to share skills and issues within companies and activities - this sharing is both a brake at present but a lever - the consolidation of needs to weigh more heavily on training structures and to trigger the implementation special devices for the CRNC sector

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

I do not believe there are equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

In progress but with a link more and more important with the innovation as technological, as technical - and this on all the products (ships) and equipment that on the associated services (mco.).

9. Prospects for the long-term future (more than 10 years).

N/A.

10. Other comments and contributions not included in the questionnaire.

The ship repair construction business in Brittany and in particular the Lorient basin is very dynamic, since 2016 we are recording a progression, the know-how and skills held by the companies involved in this activity is widely recognized. Nevertheless, it is important to take into account the growing risk of skills losses, training times being long it is necessary to anticipate.

In previous years, although we are all fully aware of this loss of skills, the business plan would not allow these times to invest in the renewal of human resources, this distortion of time has caused a collapse and even the almost complete loss of certain skills that are considered key within our SMEs.

Interview 4: Sofresid Engineering

Frederic Guena, Managing Director of Sofresid Engineering Brest and President of BPN.

Date: June 22nd, 2018.
Place: Survey
Interviewer: Lise Hermite (Bretagne Pole Naval)

1. Definition of the situation in the naval sector in the region.

I don't believe there has been any significant evolution of the naval sector in the region over the past 5 years.

2. Strengths of the sector. Keys to its success.

The strengths of the sector relate to 1/ Innovative products-projects/ 2 expertise of the work force / 3 the geographical location of the activity.

3. Weaknesses, difficulties and most relevant problems.

In my opinion, obviously the loss of competence is the first problem of the sector (asbestos).

4. Competitiveness level of naval industry companies.

Competitivity (price) compared to shipyard from South Europe or worldwide (ie. Asia).

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

It is necessary to develop innovation in both project and design engineering, especially so that this sector can stand out from the international competition and position itself on the new markets related to the energy transition (EMR, ships propulsion LNG / electric / hybrid, NOx emissions reduction ...). France has a very small head start on the so-called emerging countries - industrial innovation is therefore essential to maintain this median level.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The naval sector is suffering overall from an unattractive image among young people while some positions are very difficult to fill due to a lack of candidates. This perception should be improved to attract young people. Which would facilitate the development of dedicated trainings already implemented (such as naval specialisation, learning…) as they often suffer from a lack of candidates.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

I believe there are equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

I believe the future of the sector is stable.

9. Prospects for the long-term future (more than 10 years).

I believe the future of the sector is stable.

10. Other comments and contributions not included in the questionnaire.

In my capacity as president of the BPN industrial cluster and my knowledge of the various sectors, shipbuilding and ship repair is currently progressing, but the balance remains very fragile and it is therefore necessary to provide companies with all possible means of tools allowing them to be visible on the international scene. BPN's actions must contribute to strengthening the size of companies by

initiating groups that will have the ability to position themselves collectively on export markets. The role of clusters is therefore major to federate companies, support them in export, position them on groups, strengthen them in terms of human resources, and support them in their innovation, while working in synergy with neighboring countries that face the same problems both in terms of size and lack of human resources.

Interview 5: TWOT – sail cargo ship project

Thibault Reinhart, President TWOT – sail cargo ship project.

Date: May 30th, 2018.
Place: Survey
Interviewer: Lise Hermite (Bretagne Pole Naval)

1. Definition of the situation in the naval sector in the region.

N/A.

2. Strengths of the sector. Keys to its success.

Innovation is the decisive criteria, not only for the R&D but also for the industrial innovation of new materials, as well develop the maritime transport design.

3. Weaknesses, difficulties and most relevant problems.

In my opinion, the lack of public political support for the development of an innovate naval industry.

4. Competitiveness level of naval industry companies.

The shipbuilding sector has a major concern in the way of thinking its mode of transport by including the new methods of propulsion, as well as the freight in an environmentally friendly way. Our company is specialized in the sail transport – cargo ship basis: By using the wind force in order to reduce the carbon emissions, the sail transport offer perspective of innovation and economic development.

5. Importance of R+D+i in the sector and level reached by its companies and surrounding institutions (technology centers, training institutions ...).

Technological engineering and industrial innovation are extremely important for the shipbuilding and the ship repair sector.

6. Qualification and training level of the personnel in the companies. Positive and negative points to highlight.

The naval sector would benefit from improved 1/ basic training / 2 trainings navalisation / 3 strengthen the practice of the English language.

7. Equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

I do not believe there are equal opportunities for underrepresented groups (women, people with disabilities, foreigners ...), both in access to the sector and in their working and professional conditions.

8. Prospects for the future of the sector in the short/medium term (up to 5 years).

In progress TOWT is conducting a research and development study for the construction of a sail cargo ship. Supported by ADEME, the project benefits from the Investors of the Future Program. It aims to design a new generation of tall ships for the transport of goods that meet the criteria of cost, reliability, capacity and speed. The modern sail cargo ship is a great vector of innovation. It will enable the application of new technologies, particularly in naval architecture, and also new environmentally friendly logistic and commercial uses.

9. Prospects for the long-term future (more than 10 years).

I believe the future of the sector is stable.

10. Other comments and contributions not included in the questionnaire. (N/A)

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