STUDY ON DEEPENING UNDERSTANDING OF POTENTIAL BLUE GROWTH IN THE EU MEMBER STATES ON EUROPE'S ATLANTIC ARC

CLIENT: DG MARITIME AFFAIRS AND FISHERIES

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0. Preface

This country fiche forms part of the Atlantic Arc sea basin study. Parallel sea-basin studies are being carried out on the North-Sea and the English Channel and the Mediterranean, Adriatic and Ionian and Black Sea and the Baltic Sea. The data definitions and template are adapted in such a way that exchange between the different sea-basins is made possible.

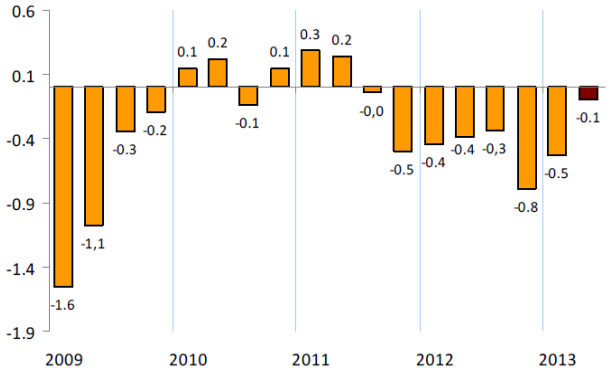
Brussels, March 2014

1. General overview

1.1. Country overview:

The economic crisis has marked a period of serious economic decline in Spain, reversing the economic expansion that was observed in the receding period. In the first quester of 2013 a downturn of - 0.5% GDP was registeredi (total GDP value of € 255 bn)[1]. Fiscal adjustments policies and the bank system restructuring process have had important consequences on the national demand, counterbalanced by a timid increase in exports.

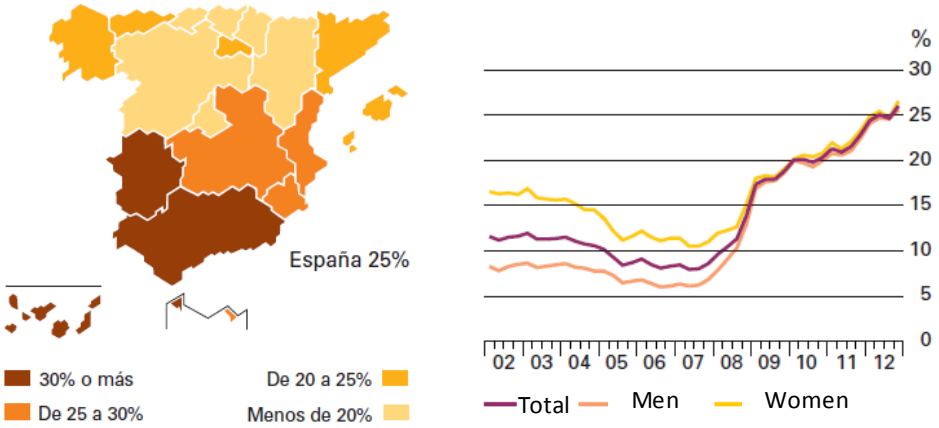
Figure 1.1 **Gross Domestic Product (quarter-on-quarter growth rates)**



Source: European Central Bank, Statistical National Office and Bank of Spain.

The population of the country has steadily decreased since the beginning of the economic crisis mainly due to the tight pressures on the labour market forcing the exodus of emigrants and the return of immigrants. On 1st of January 2013, the population of the country amounted to 46 704 314, with an unemployment rate of 27.16% as published by the Statistical National Institute[2].

Figure 1.2 **Unemployment figures for 2012**



Source: INE

[1] Statistical National Office, Spain. Data: 1st quarter 2013.
[2] Statistical National Office, Spain.

At present, Spain's Structural Reform and Economic Policy Programme focusses on unemployment, one of the main challenges of the country for prospective years along with productivity, flexibility and competitiveness. The industry has developed since 1960 in diverse sectors, including textile, food-processing, machinery, and iron and steel. However, the key contributors to the Spanish economy are the automotive industry and tourism. Some 1% of GDP in Spain stems from fishery activities, representing a GVA of € 2 bn. Compared to the previous year (2010), this presents a 9% increase. Aquaculture formed some 30% of these fishery activities. For the same period, fishery employed 37 495 people facing high unemployment and labour market pressure that, accompanied by the ageing of the occupied population (average age of 40 years old) and the lack of generational replacement, sheds some lights on the future prospects of this maritime economic activity. Nonetheless, other sea related activities are reporting positive trends, such as maritime transport and the coastal tourism. The strategic geographic location of Spain, as a gateway to the Southern European Hemisphere and EU neighbouring regions (Union for the Mediterranean) makes it a perfect logistic platform towards the African and the South American continents. At this regard, maritime transport and port activities represent for Spain around 1.1% of GDP, and provide around 35,000 direct and an additionalr 110 000 indirect jobs[3].

Tourism, in particular the Mediterranean coastal tourism and cruise, are important sources of income for the country: the total number of nights spent by both residents and non-residents in Spain during 2012 was 382 670 976, of which 79% were coastal[4]. Employees in accommodation and food services activities amount to 16 635 in the 1st quarter of 2013[5], although the figure is shrinking since 2011. Besides, nearly 30% of positions are temporary[6] and follow season-bound fluctuations with slight increases during the summer period. Maritime passenger transport has gained in significance for the Spanish economy, in part explained by the increasing relevance of cruises in this market area with a total of € 1 255 m billed in 2012[7].

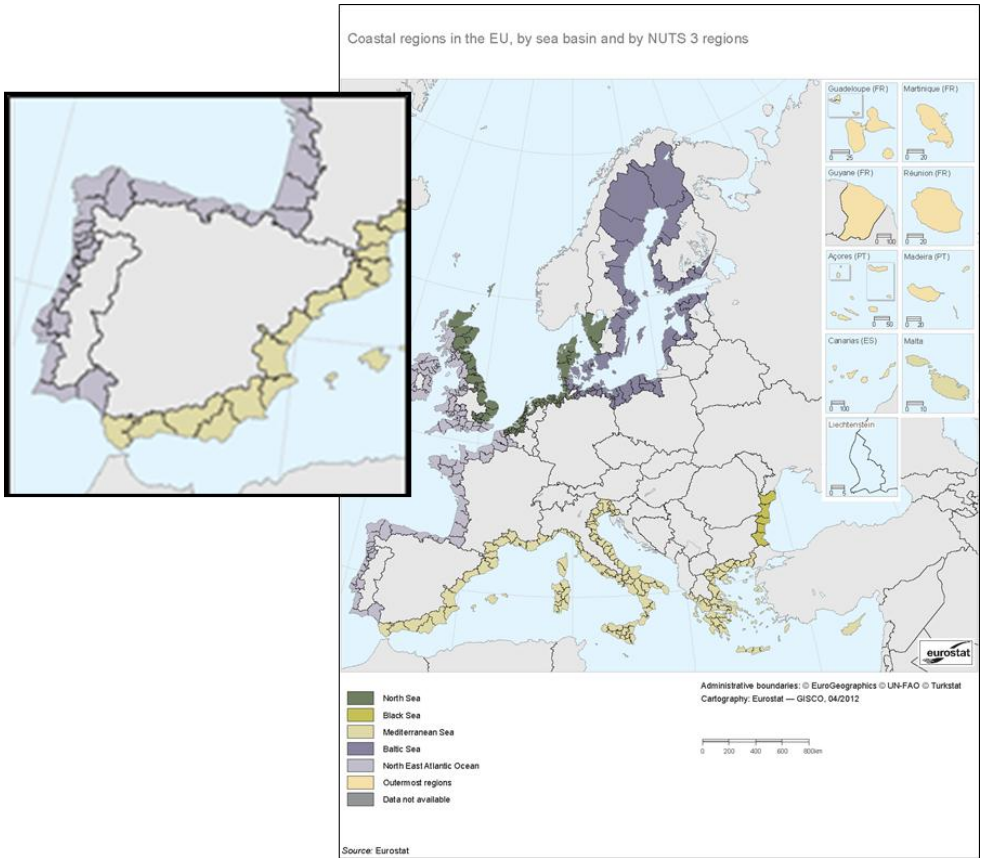
The shipbuilding industry, currently in crisis, is one of the main maritime traditional activities in Spain, at the leading edge in the international markets and in clear competition with Asiatic countries. During the period 2008-2011, the annual billing amounted to € 3 000 m and provided 8 000 direct and 17 000 estimated indirect jobs[8]. Nonetheless, the decreasing demand and the low levels of order bookings in the last year show that the sector is in decline.

[3] Puertos del Estado.
[4] Eurostat.
[5] Eurostat.
[6] Eurostat.
[7] Informe anual de contribución económica 2013. Puertos del Estado.
[8] ICEX.2001. España Sector de Construcción Naval.

1.2. Coastal regions[9]

Spain has the largest coastline of all EU countries, with a total of 7 876 km[10] of sea and oceanic water[11] bordering the Iberian peninsula and the Canary and Balearic Islands[12], this equals to 12.12% of the European Coastline[13]. The Economic Exclusive Zone (EEZ) covers 551 874 Km^2 for the continental mainland and 455 397 Km^2 for the Canary Islands[14]. Landscan reports that 33.2% of Spain's population, i.e. 15.5 m people, are living within 10 km from the sea. [15].

Figure 1.3 **Coastal regions in Spain**

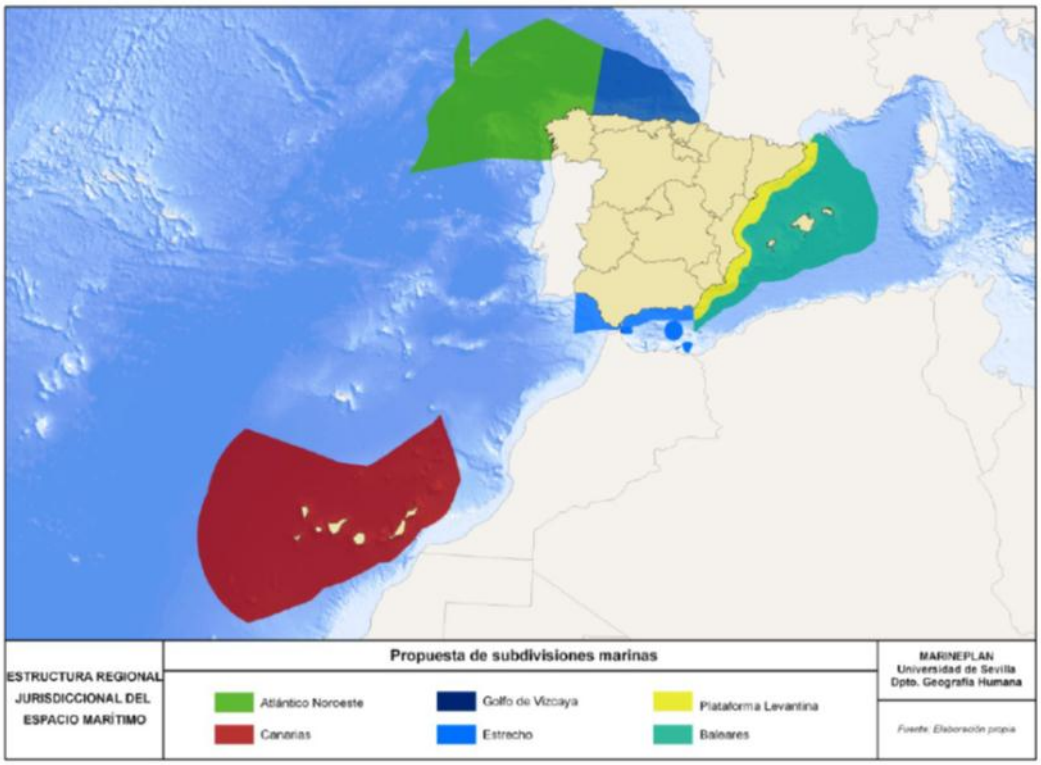


Its mainland is bordered to the south and east by the Mediterranean Sea; to the north and north east by the Bay of Biscay; and to the west and northwest by the Atlantic Ocean. It is one of the

[9] An EU coastal region is a statistical region of the European Union (EU), at NUTS level 3, defined according to one of the following criteria: 1) The region has a sea border, 2) The region has more than half of its population within 50 km from the sea,that is based on the GEOSTAT 2006 population grid. See also: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Coastal_region.
[10] The World Resources Institute data, spanish coastline is 8000km ,using and 50km interval scale.
[11] Statistical National Office, Spain. Data : 2008. Alternative data from the 2012 Annual Report of the Ministry of Agriculture, Food and Environment states that the Spanish coastline is of 10,250 km2, measured according to the procedure described by the Spanish Coastal Law. This difference could be attributed to the fact that the Spanish Coastal law determines the coast borderline and delivers cartography drawing of mentioned line at scale 1:1000. *http://www.magrama.gob.es/es/ministerio/servicios/publicaciones/10-II-F-Costas_y_medio_marino_tcm7-286714.pdf - page 639*
[12] However, this figures will have to be treated with caution due to the coastline paradox. It states that "….a coastline does not have a well-defined length. Measurements of the length of a coastline behave like a fractal, being different at different scale intervals (distance between points on the coastline at which measurements are taken). The smaller the scale interval (meaning the more detailed the measurement), the longer the coastline will be.[Note 1] This 'magnifying' effect is greater for convoluted coastlines than for relatively smooth ones." See also: http://en.wikipedia.org/wiki/List_of_countries_by_length_of_coastline
[13] European Union coastline is around 66.000 Km.
[14] Sea Around Us Project, The Pew Institute. www.searoundus.org
[15] LandScan™ Global Population Database, 2006. % share of coastal population based on 2006 data. To calculate the total number of coastal population, we assume that the share of inhabitants living within 10 km from the coast remained equal from 2006 to 2012 and apply the 2006 % share to the 2012 population data of 46,761,264 (Spain, 2012 figures, based on Eurostat).

three countries on the Atlantic Arc (along with Morocco and France) to have both Atlantic (4 419 km) and Mediterranean coastlines (3 457km).

Figure 1.4 **Maritime regional subdivision in Spain**



The maritime-regional subdivision of Spain shows the different regional areas exposed to the sea, meeting different levels and intensities of maritime activities.

Golf of Biscay - Cantabria

The Golf of Biscay-Cantabria, situated in the north of the country (Dark Blue), is characterised by an important and speciliased level of innovation and technological development associated to shipbuilding and R&D in maritime sciences. The regions of Asturias, Cantabría and País Vasco concentrate the largest number of around 23.3% of the national shipbuilding companies. In general the Atlantic region has also a more relevant role, comparing to the Mediterranean arc, in terms of fishing and aquaculture and offshore renewable energies. On the other hand, the offshore oil and gas reserves and, above all, the touristic activities are more important in the Mediterranean.

At a regional level, the maritime economy represents 2.5% of the Basque Country's GDP, with a total value of € 2 100 m and 17 000 employers. The Port of Bilbao moved around 33,3415 m Tonnes so far this year and is ranked the fourth Port in term of traffic activity at the national scale (data June 2013).

Northwest Atlantic

The Northwest area, covering mainly Galicia (Green), is characterised by its biological *richness*, intensive fishing and aquiculture activity, maritime transport traffic (Port of Vigo) and shipbuilding industry (15.3% of the National Shipbuilding Companies). The Galician Fleet capacity represents 6% of the total fleet of the UE, and is the largest of Spain. Fishing production raised to € 182 m in 2006, and the percentage of employment in the field of extractive fishing if compared with national

levels is 45,5% in and 65% in aquaculture. On the other hand, Galicia accounts for 87% of Shellfish state Affiliates according to the Ministry of Agriculture, Fishery and Food (2006).

Andalucia – Straits area

The autonomous region of Andalucia covers the Straits area (Light Blue), distinguished by its geostrategic location, biological richness of the marine ecosystem, traditional fishing development and aquaculture potentiality. Andalucía ranks first in terms of national shipbuilding companies. The fishing production and processing industry is meeting a reconversion that has produced a drop in its activities during the last years towards the development of aquaculture. Notwithstanding, fishing production raised to € 44 m and Fishing Processing € 184 m in 2006. On the other hand, the Port of Algeciras is the main port of Spain in terms of Maritime traffic volume, and the first in the Mediterranean Region, steadily increasing the cargo transport and cruise tourism in the last years and becoming the third port at the national scale (data June 2013).

Levantine platform

The Levantine platform covering the South-East regions of Murcia, Valencia and Catalunya is characterised by a potent port system (Barcelona, Valencia, Cartagena and Tarragona), accompanied by a developed tourism infrastructure and industry sector established along the coast. Cruise tourism is increasing in the region, mainly in Barcelona, Valencia, Alicante and Cartagena, sharing the space with marinas and maritime leisure sports. The region has a developped tourism activity and developed industry near the coast, that produces numerous land-sea releases. Because of that, fishing activities in this area are particularly exposed to the increase of industrial emissions and wastes.

Canary Islands

Spanish Islands are marked by a strong economic dependence to the sea and coastal tourism. The Canary Islands (Red) , traditionally a European touristic destination is also increasingly meeting high standards of maritime traffic, given its intrinsically characteristics as an island, its geographical distance with the Peninsula and its geographic location at the center of the African, South American and European Continents. The ports meet an intensive activity in terms of fishing, fuelling and provisioning of vessels, cargo traffic, ship repair and cruise destinations. In this sense the Port of Las Palmas has experienced an extraordinary increase in terms of maritime traffic, representing 22,34% of the national volume in 2007.The biodiversity and ecosystem of the maritime protected areas are also the scene for the development of leisure and sport activities such as diving, cetaceans sighting, surf, windsurf, etc. From its side, the Balearic Islands has a predominant position in the country and the EU Zone as a destination for international tourism and recreational boating, that generates important revenue sources for the Island. Intensive traffic is due to cruise shipping and recreational boating that let the entrance of a total of 294 118 nautical tourists in 2007, thus generating an income amount of € 527 m. The region has the highest number of moorings and marinas of the country.

Balearic Islands

The Balearic Islands have a predominant position in the country and the EU Zone as a destination for international tourism and recreational boating, that generates important revenue sources for the Island. Intensive traffic is due to cruise shipping and recreational boating that accumulated a total of 294 118 nautical tourists in 2007, thus generating an income of € 527 m. The region is one with the the highest number of moorings and marinas in the country, constituting a mooring stations in the Western Mediterranean.

Due to insularity, maritime transport is extremely important in the Balearic Islands, particularly for the shipping of goods, which in turn is indispensable for business activity. Nautical tourism is currently undergoing a considerable development, as well as the repair and maintenance activity of yachts and sailing vessels, and nautical sports.

2. Maritime economic activities

2.1. Overview of relevant maritime economic activities in a Member State

This section provides an overview of the main maritime activities and their related socio-economic impacts in Spain as a whole (NUTS 0). These economic activities are analysed, described and updated according to the NACE rev. 2 classifications.

The analysis is carried out in two steps:

- The first step focuses on the collection of **quantitative data** on the maritime economic activities. As far as possible data are based on Eurostat and official national statistics, where relevant (or necessary) complemented with alternative secondary sources. The methodology is harmonised across the different parallel sea basin studies;
- The second step provides a **qualitative review** of the maritime activities and their status. The information presented builds on the data collected, supplemented with specific inputs and analysis by the country editors.

2.1.1. Quantitative overview of maritime economic activities

Table 2.1 provides an overview of the most reliable data for each of the maritime economic activities[16]. More detailed information from all relevant sources is provided in **Annex I**. Annex I provides further explanation on the methodological assumptions and the underlying definitions that have been used. A separate Methodology Annex provides further explanation on the methodological assumptions and the underlying definitions that have been used.

Table 2.1 Overview of relevant maritime economic activities at country level

Maritime economic activity		GVA (€, m)	Employment	Number of enterprises	Sources for number of enterprises	Source & Reference year for GVA and employment data
0. Shipbuilding						
0.a	Shipbuilding and repair	1 391.5	24 122	1 018	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Eurostat, data for 2010
0.b	Construction of water projects	944,5	19 813	135	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Eurostat, data for 2010
1. Maritime transport						
1.a	Deep-sea shipping	621.1	8 864	1 093	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Eurostat, data for 2010. No data on NACE 77.34 and 52.22 available in Eurostat
1.b	Short-sea shipping	649.1	9 262	1 142	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Eurostat, data for 2010. No data on NACE 77.34 and 52.22 available in Eurostat

[16] The maritime economic acitivities are consistent with the activities discerned in the Blue Growth Study. In deviation tot his study Shipbuilding and the Construction of Water projects are added as separate economic activities.

Maritime economic activity		GVA (€, m)	Employment	Number of enterprises	Sources for number of enterprises	Source & Reference year for GVA and employment data
1.c	Passenger ferry services	353.0	5 582	622	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Eurostat, data for 2010. No data on NACE 77.34 and 52.22 available in Eurostat
1.d	Inland waterway transport	4.5	94	39	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Eurostat, data for 2010. No data on NACE 77.34 and 52.22 available in Eurostat
2. Food, nutrition and health						
2.a	Fisheries for human consumption	3 720.0	129 230	6 377	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	JRC (fishing), Eurostat (fish processing, wholesale & retail), PRODCOM (share of human/animal), data for 2010
2.b	Fisheries for animal feeding	11.5	454	16	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	JRC (fishing), PRODCOM (share of human/animal), data for 2010
2.c	Marine aquaculture	130.0	22 882	4 985		-JRC, data for 2010 -Agricultura y pesca (Informe sectorial 2013 - Barcelona Activa)
2.d	Blue biotechnology	n/a	n/a	n/a		Not available in Eurostat. No alternative data on Spain found centrally
2.e	Agriculture on saline soils	4 573.4	406 946	n/a		Eurostat, data for 2010 (agriculture in coastal NUTS-2 and percentage saline soils.
3. Energy and seabed materials						
3.a	Offshore oil and gas	16	n/a	113	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Sector not visible in Eurostat, nor official national statistical sources
3.b	Offshore wind	n/a	n/a	n/a		Sector not visible in Eurostat.
3.c	Ocean renewable energy	n/a	n/a	n/a		Sector not visible in Eurostat. Report 2010: « Impacto socioeconómico y climático de las energías renovables »
3.d	Carbon capture and storage	n/a	n/a	n/a		Sector not visible in Eurostat.
3.e	Mining (sand, gravel, etc.)	0	0	0	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	No offshore aggregates mining in Spain according to UEPG
3.f	Marine minerals mining	n/a	n/a	n/a		Sector not visible in Eurostat.
3.g	Desalination	382	4,186	n/a		Sector not visible in Eurostat. Global Water Insights, data for 2010 based on producction share of sea & brackish water & Eurostat NACE 36.00

Maritime economic activity		GVA (€, m)	Employment	Number of enterprises	Sources for number of enterprises	Source & Reference year for GVA and employment data
4. Leisure and tourism						
4.	Coastal tourism (accommodation)	6 596	206 397	11 737	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	Eurostat, data for 2010 (data for NACE 55.10, 55.20, 55.30, 55.90)
4.2	Yachting and marinas	3 303	62 107	2 359		Innovamar, 2011. Sector not visible in Eurostat.
4.3	Cruise tourism	232.1	3 670	409	Number of enterprises per relevant NACE code counted in AMADEUS 2010, same support data as for Eurostat calculations	(low estimate) Eurostat, data for 2010. No data on NACE 77.34 and 52.22 available in Eurostat Further indicators: (high estimate) European Cruise Council, data for 2010
5. Coastal protection						
5.1	Coastal protection	49.8	498	n/a		Eurostat COFOG, data for 2010; PRC the Economics of Climate change, data for 2008
6. Maritime monitoring and surveillance						
6.1 / 6.2	Maritime surveillance	n/a	n/a	n/a		Sector not visible in Eurostat.
6.3	Environmental monitoring	24.2	n/a	At least 7		EMODNET Sector not visible in Eurostat.

2.1.2. *Review of maritime economic activities in Spain*

Shipbuilding and water projects

Shipbuilding and repair[17]

Commercial and naval shipbuilding

Traditionally, the shipbuilding sector in Spain has been an emblematic industry[18] and economic engine in certain regions (mainly in the Northwestern and Cantabrian coast, as well as Andalusia). It was forced into conversion in the 80s, as a response to the growing internationalization of the shipbuilding market (civil and military) and following European policies and standards. Within the European naval framework, initiated in the 1970s total convergence with competitivity principles and horizontal norms applicable to other industrial sectors is pursued, limiting the scope of state economic aids to the shipbuilding sector. At this regard the "Gerencia del Sector de la Construcción Naval" created in 1984 is commissioned to the steady and coordinated reconversion of the Spanish shipbuilding industry and the elaboration of the assessment reports on the concession of state aids in accordance to the European naval framework.

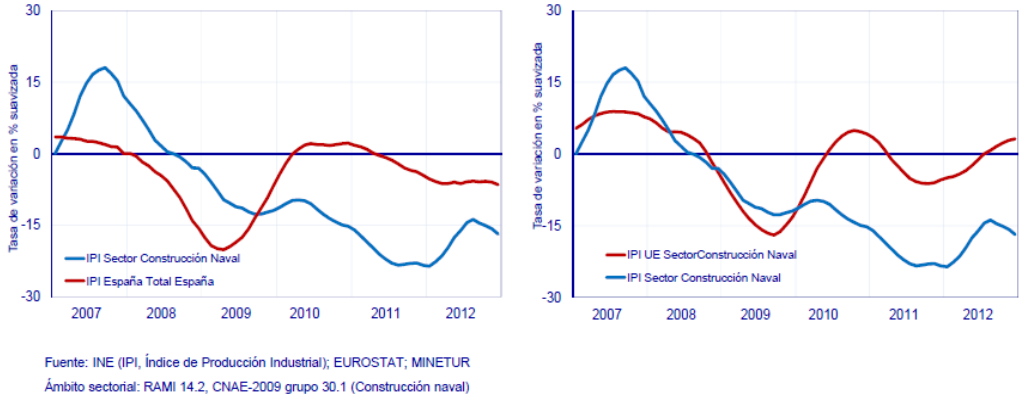
New business strategies involved internal re-organisation and innovative access to finance mechanisms to reduce costs, to achieve maximum independence in process and technology productivity, labour specialisation and maintenance of know-how. Besides, it created the incentive to instal a more integrated production network to facilitate the reationships between the industry

[17] Source: LA SITUACIÓN DE LA CONSTRUCCIÓN NAVAL EN ESPAÑA PERSPECTIVAS EN UN MERCADO GLOBAL, ALFREDO SUAZ GONZÁLEZ, Secretario Técnico Gerencia del Sector de la Construcción Naval

[18] Although the naval sector represents less than 0,1% of GDP in the national economy, the sector is emblematic due to the long tradition and its positive spill over in the whole of the industry sector, in terms of its export capacity, competitiveness, and technology development.

and the supplier side. The recent economic crisis, and the New European Naval Framework adapted in 2011 which establishes the end of State Aids in the sector in the time-frame 2012-2013, has accelerated the process of consolidation and adjustment by a near halt of recruitment in 2011. As a consequence, during that same year, only new orders were made for the production of an amount of 21 793 CGT. The backlog in the fourth quarter amounted to only 175 427 CGT, which represents a fall in the portfolio of almost 30% over 2010. Following the same trend, the Industrial Production Index has met a significant decrease both in comparison with the whole of the Spanish industry IPI and the European Shipbuilding sector IPI, thus stating that the real production output of the Shipbulding sector is below EU standards. The following graph shows the evolution during the last years.

Figure 2.1 **Evolution of the Industrial Production Index (in terms of annual variation rate)**



Source: National Statistical Office , Spain.

The status quo of the Spanish shipbuilding industry makes that the industry is essentially export-oriented, based on high-tech and R&D . It provides over 25 000 jobs, both in the public and private shipyards and in the supply and equipment industry, services, and research centers, most of them requiring high qualification skills. Today, it presents a key economic sector in several Spanish regions, due to its economic and employment impact: between 2008 and 2011, shipbuilding in Spain assumed an annual production capacity of 300 000 CGT[19]-, with an average turnover exceeding € 3 000 m.

In terms of employment, it directly employed some 8,000 workers (3 000 in private shipyards and 5 000 in public[20]). Besides, the shipbulding industry generates around 17 000 jobs indirectly, notably in the supply industry. The current production is specialised in the contruction of ferries, dredges, tugs, offshore vessels, vessels equipped with earthquake and natural disasters detection systems. Besides, some ocean and marine research as well as general cargo ships.

Currently, the shipbuilding sector in Spain is composed of two types of firms: on the one hand, shipyards with better educated labour force, but of an advanced age. In these shipyards, employment is rather stable, despite market labour pressures and potential licensing in the future; on the other hand, the supply industry companies, which usually employ young workers with little training and very unstable employment, dependent on the economic cycle. In auxiliary companies, most of which are SMEs, as in shipyards, strategies are focusing in technological improvement,

[19] CGT: Compensated Gross Tonnes
[20] The high number of public jobs in the shipbuilding sector is due to the characteristic of the major shipbuilding enterprise, NAVANTIA. The company is publicly owned and employed around 5.000 employees in 2009. NAVANTIA is specialised in military shipbuilding. Since 2005 it is the only public enterprise as a result of the privatisation process affecting formerly state-owned shipbuilding companies. See also: www.navantia.es.

more sophisticated and complex ship construction and decreasing delivery times, in order to bring this sector to the requirements and demands established by the highly internationalized and competitive market. The sector encompasses currently a total of 307 companies according to the Ministry of Industry, Tourism and Commerce[21]. The main companies are the state Company Navantia, and around 25 private companies.

Initially oriented to the military sector, Navantia has developped several ambitious Projects and Programmes for the Spanish Navy such as the frigate F-100, the amphibious assault ship LHD "Juan Carlos I", the combar supply ship "Cantabria" and currently the submarine S-80 and the construction of sea-going vessels. It has also involved in the design and final construction of the first diesel electric submarine of the world the S-81 Isaac Peral and the first gas propulsion vessel, the aircraft carrier Príncipe de Asturias. Currently the company has a major project with the Australian Royal Navy, and it has sell military vessels to Norway, Venezuela, Malaysia, Chile, India, Thailand, and Egypt.

On the other hand, most of the private shipyards are specialized in High End Value Vessels, including Oceanographic Vessels, Sismic Vessels, Chemical Tankers, Ferries and Ro-Ro, Ro-Pax, Tuna Vessels,Suppliers and other offshore vessels etc. Due to the economic constraints, shipbuidling companiesare investing in new projects seeking the diversification of activities from shipbuilding and repair towards the field of offshore wind energy. At this regard the state company Navantia is currently developing 3 high-tech projects, such as the design and construction of steel structures for the improvement of wind power plants (SEAMAR project), the design of floating-platforms and production procedures for its commercialisation (FLOATGEN project), and the development of floating- platform and offshore wind turbine for ocean wind speed measurement and prediction.(IN-OFF MET project).

Construction of leisure boats

During the period 2002-2006 the sector has met a stabilised economic situation, recording an accumulated growth rate of 22%[22]. In 2008, the number of leisure boats was 219,475[23], meeting a severe decrease in comparison with previous years that recorded a fall on the number of registered boats of 6.1% less than the previous year. Nonetheless, the national market share contraction is minor if compared with leisure boats' imports, this is imports diminished 5 points vs 3 points of the national producton. At this regard it is important to mention that motorboats, the principal product of the sector in terms of sales, have registered a decrease of 8.8%, although their share in the market is still in 58%. This means that the demand of national boats is still confident on the quality of national products.

Construction of water projects[24]

According to recent figures (2011), € 469 m have been invested in infrastructure and port capacity. The A Coruña Port has concentrated the largest amount invested (21%), followed by the ports of Balearic Islands (9.6%), Barcelona and Valencia (9% each)[25].

[21] Minetur, May 2013 : http://www.minetur.gob.es/es-ES/IndicadoresyEstadisticas/Presentaciones%20sectoriales/Construcci%C3%B3n%20naval.pdf
[22] El sector Naútico en España 2010, Asociación de Naúticas de Recreo de España.
[23] INNOVAMAR.
http://www.magrama.gob.es/es/agua/temas/delimitacion-y-restauracion-del-dominio-publico-hidraulico/Obras_de_nuevas_presas_en_Espa%C3%B1a_en_ejecuci%C3%B3n_-_Viernes_15_de_junio_tcm7-212129.pdf
[25] For more information please refer to:
http://www.puertos.es/sites/default/files/anuario_estadistico2011/archivos_internos/contenidos/05/050102.html

Other investments, calculated by objectives by the Ports of Spain Authority, include Logistics activities and Intermodality (13.6%), Port equipment and Installations (11%), Passengers (4.4%), and Port-city relation (2.5%). In general terms, major investments were carried out in the Ports of Barcelona (€ 171 m), Baleares (€ 94 m) and Valencia (€ 93 m), followed by Tarragona and St Cruz de Tenerife ports (each one of them with nearly € 70 m).

Maritime transport

Deep sea and Short Sea shipping

Spain has 22 major ports, which are included or adjacent to any of the corridors that will be interconnected trought the European transport networks. The total network traffic of these ports exceeded 375 m tonnes in 2010. 75% of these goods, more than 283 m tonnes, were shipped to ports located in the Mediterranean and South Atlantic, while the remaining 25%, about 94 m tonnes, were registered at ports in the front of Biscay and North Atlantic.[26]

Figure 2.2 **Ports of Spain**

Source: Puertos del Estado (www.puertosdelestado.es)

At this regard, the Maritime Motorway (Marco Polo Programme) linking Gijón to Nantes-St. Nazaire, was inaugurated in 2010. aiming to switch to greener transport modes including among others, the creation of Sea-Routes. In 2013, investment will be put in place to extend the Atlantic Maritime Motorway to Vigo City, in Galicia. On the Mediterranean coastline, the Algeciras Port Hub has intensive activity and is considered by the UNCTAD as the Mediterranean Port Hub due to its reliable and sustainable hinterland connections, but also its capacity and openness to Mediterranean countries by sea. On the other hand, the port hub of Las Palmas, at the centre of the main maritime routes merging Europe, Africa and South America has enormous potentials in terms of cargo transport. The Project Las Palmas Bunkering Hub, taking the example of the Panama Channel Bunkering, aims to become the petrol station in the Atlantic merging the 3 continents[27]. Finally, the Puerto Seco de Madrid is a Maritime Intermodal Terminal created in 2000 relating Madrid's Logistic Centre with the main Ports of Spain (Algeciras, Bilbao, Barcelona y Valencia).

[26] Study by the Ministry of Public Works and Puertos del Estado: Port System in Spain 2011-2012
[27] Memoria Anual Puerto de Las Palmas 2011. http://www.proyectogesport.com/descargas/bunkering.pdf

To better link rail corridors with shipping services, ports ended the year with another novelty with regard to intermodal freight transport in large state-owned docks. At this regard, agreements were signed in late October 2010 between ADIF and eleven Spanish ports regulating railway connections, aiming to improve the integration and coordination of the rail network with the State Ports infrastructure and boost both the rail freight and the competitiveness of Spanish ports.

Moreover, the direct, indirect and induced activity of the port system represents around 20% of GDP of the transport sector, which represents 1.1% of national GDP. It also generates direct employment for about 19 000 jobs[28]. The ports of Valencia, Algeciras Bay, Barcelona and Las Palmas moved 10.2 m TEUs in 2010, with an average growth rate of around 7% in comparison to 2009. With this handling capacity, Spanish ports rank among the top ports in the world and the twenty most important in Europe. E.g. Valencia was ranked as 26th in the world and 5th in Europe, Algeciras Bay 42nd and 8th, Barcelona 63rd and 12th, and Las Palmas 95th and 18th, respectively, in the ranking of the first hundred ports around the world in this kind of traffic[29].

Passenger ferry[30]

Passenger ferry transport is increasing in significance for the economy, with a total volume in the whole country of 27 147 000 passengers during 2011. It is strongly focussed on the Mediterranean and Islands Coastline, notably in the ports of Andalucia (25% of the total), Canary Islands (24% of the total), Balearic Islands (21% of the total), and Catalonia (14% of the total)[31]. The rather high number of ferry passengers observed in Andalucia (around 6.8 million during 2011), is mainly due to the Estrecho Cross- sea Operation, intensifying the transport from the ports of Algeciras, Almería, Málaga, Motril and Tarifa to North African Countries during the summer period. As an example, in July 2013, a total of 48 223 vehicles and 187 880 passengers embarked from the Southern Spanish ports to the North African cities of Ceuta, Tánger, Melilla and Nador. Main routes are Algeciras-Tánger, Algeciras-Ceuta and Almería- Nador with more 5 000 vehicles although during the summer 2013 the figures have slightly decrease. Estimations of the sector GVA account for € 353 m, employing 5 582 people.

Inland waterway transport[32]

Sevilla Port is an inland waterway port located at the river Guadalquivir. It is the only inland commercial port in Spain. The Guadalquivir river navigation is performed in the navigation channel, called Euroway Guadalquivir E-6002 within the European Network of Waterways. In the facilities of the Sevilla Port the loading and unloading of goods is perfored. They are afterwards exported to other countries or transported to other areas of the Spanish territory. Goods are also imported from abroad and then are distributed by road or rail. Potentially navigable up to Mértola, the Project Guadiana, cofinanced by the FEDER, aims to improve the navigation characteristics of the Guadiana river, both in the Spanish and Portuguese stretch to enhance sustainable tourism, sports and recreational use.

[28] Study by the Ministry of Poblic Works and Puertos del Estado: Port System in Spain 2011-2012
[29] Press Note – Puertos del Estado - http://www.fomento.gob.es/NR/rdonlyres/daf706e5-ec27-4857-a59f-9a490433d30b/107126/11103102.pdf
[30] http://www.proteccioncivil.org/documents/11803/0/Informe+OPE+02+julio+2013
[31] Source : National Statistics Institute (passenger transport data for 2011)
[32] http://portal.apsevilla.com/wps/portal/puerto_es/datosTecnicos_es

Food, nutrition and health

Fisheries for human and animal consumption[33] [34]

Fishing provides employment to 41 500 people[35] (5.7% of the total occupied in the whole sector and 0.24% of the total employed in Spain). This value is 4.5% higher than in the first quarter of 2012 and 27.7% higher than the second quarter of 2012. However, since 2008 fishing employment has decreased by 13.5% (equal to approximately 6 500 fewer jobs). The number of people unemployed in fishing in Spain, in the second quarter of 2012, is 3 200, representing an unemployment rate of 7.2%, well below the average of the Spanish economy (24,63% in the second quarter of 2012)[36].

Marine fisheries accounted for Gross Value Added (GVA) of € 901,52[37] m (in 2011). Compared to 2010, this means a 8.2% higher GVA. The operating income for fisheries amounted to € 2 087.6 m, a 9.2% compared to 2010. Nonetheless, the fisheries subsector obtained a negative balance in July 2012 (€ -156 m), although there is an improvement with the amount obtained in the same month in 2011. Between August 2011 and July 2012, the balance of the fishing sector was also negative (€ -1 767 m), although the pattern showed a positive trend in comparison with the same period last year (between August 2010 and July 2011). In 2012, fish Exports (including aquaculture and processing fish industry) amounted to € 2.7 m although imports were € 4.5 m which constituted a negative commercial balance of € 1.7 m[38]

The Spanish Canning industry is acquiring increased relevance, leader in the EU market and third in the international market, thus meeting an increase from 1996 to 2006 of 42% in gross terms and 81% in terms of income. Tuna and anchovies are the main products.[39] The Canning Industry is mainly concentrated in Galicia, where are established 58 out of the 144 spanish canning companies. Only the 5 main companies have a turnover of € 75 m.

In 2011, Spain had a total of 10,505 fishing boats, with Galicia (48% of total), Andalusia (16% of total) and Catalonia (9.09% of total) having the highest numbers. The Spanish vessel catches had an economic value of € 1 965 m in 2011, representing 7.8% more than in 2010. A 66.8% of the economic value comes from fresh fish for human consumption, 33.1% from frozen fish and 0.1% from fish unfit for human consumption.

Regarding the regional distribution, it is observed that the fishery activity is more important in the Atlantic region, in particular Galicia, than in the Mediterranean region (in terms of tones of fish catched, VAB, employment and number of vessels)[40].

Marine aquaculture[41]

The increased consumption of fish and the increasingly scarce marine resources became a reason for the evolution of the Spanish extractive and traditional fishing industry towards a more sustainable and environmentally friendly alternative, known as aquaculture. Thus, aquaculture includes techniques such as induced breeding fish, shellfish farms in land or/and in floating cages, with the aim of increasing the production of aquatic organisms by exercising control over these and

[33] Sources; Agricultura y pesca, informe sectorial 2013, Barcelona Activa; Estadísticas Pesqueras Ministerio de Agricultura, Alimentación y Medio Ambiente
[34] Please note that the paragraph refers to catching fish for human consumption. No information was available on the percentage of fish caught for fish feed in Spain.
[35] Data refered to fishing (not including fishing processing industry).
[36] figures for the second quarter of 2012, according to the EPA, Active Population Survey.
[37] Data refered to fishing (not including fishing processing industry).
[38] MAGRAMA, Estadísticas Pesqueras 2011.
39 Plan estratégico de la Industria Conservera Gallega 2007-2013, Centro Tecnológico del Mar-CETMAR, Octubre 2006.
[40] Economic Maritime Fishing Survey and Aquaculture Economic Survey. Source: Ministry of Agriculture and Environment
[41] Sources; Agricultura y pesca, informe sectorial 2013, Barcelona Activa; Estadísticas Pesqueras Ministerio de Agricultura, Alimentación y Medio Ambiente, Encuesta: The Economic Performance of the EU Aquaculture Sector – 2012 exercise (STECF-13-03), Joint Research Group.

on their environment in order to ensure the supply of these products to humans. Spain has constructed an important aquaculture sector, highly diversified, producing different species of freshwater and marine fish, molluscs, crustaceans, and algae with different levels of relevance in terms of quantities and values. All these farming activities can be found spread all over the country.

In 2010, Aquaculture contributed a GVA of € 130 m and the annual turnover of the sector met an increase of 11,9% during the year 2010-2011[42]. In the course of 2011, Aquaculture reached a sales value of € 457.3 m and the annual production of the sector met an increase of 7.8%[43]. The edible aquaculture production reached 271 963 tonnes in 2011, dominated by far by mussels production(212 556t), mostly concentrated in the North Western region of Galicia. It is estimated that around 75% of aquaculture production comes form shellfish although the value of this big production is just 23% of the total production. Finfish represents 24% of aquaculture production but represents 71% in sales value.[44]). As stated above (see description on fishing for human and animal consumption) fish exports including aquaculture and processing of fish amounted to € 2.7 m (2012). Imports amounted to € 4.5 m which constituted a negative trade balance of € 1.7 m[45].

Structurally, the sector is composed of 4 985 farm owners; (data for 2010) most of the firms belonging to individuals rather than legal entities, especially in the extensive and semi-extensive aquaculture like mussel in rafts, or clams in inter tidal areas. Hence, the number of small companies and independents is rather high, with the number of companies employing more than 10 staff is increasing due to a trend of consolidation, albeit at a low level of employees. In 2011, around 27 180 persons were employed in the sector.

Spain has an important role in the transformation of traditional fisheries to aquaculture. In this sense, it is one of the territories of the European Union where higher investments have been made for the development and expansion of this activity. Also, the technical and biological advances have improved the sector instruments, both in the field of agriculture and in the field of fisheries and aquaculture, which has resulted in an increased efficiency and reduced costs production. In addition, technological developments applied to the sector have helped to reduce the physical effort required to develop related occupations, and increase the possibilities of access to natural resources.

The Atlantic Arc has also a more relevant role in aquaculture than the Mediterranean region, both in terms of production (57% to Atlantic and 43.20% to Mediterranean) and employment (88% to Atlantic region and 11% to Mediterranean)[46].

Blue biotechnology

Spain plays a significant role in the Marine Biotechnology sector in Europe, with many relevant companies and R & D projects (public and private) in this field. Some significant public bodies responsible for the development of this science are the Center of Marine Biotechnology of the University of Las Palmas de Gran Canaria, located in Telde (which also hosts the National Bank of Algae), the University of Huelva, the Institute of Marine Research, the Instituto Español de Oceanografía (IEO), the Marine Science Institute of Andalusia, the Mediterranean Institute for Advanced Studies (IMEDEA) and the Coastal Osbservation and Prediction System of the Balearic Islands (SOCIB).

[42] « La Acuicultura marina en España 2012 », Asociación empresarial de productores de cultivos marinos de España.
[43] "La Acuicultura en España 2013", Asociación empresarial de productores de cultivos marinos de España.
[44] The Economic Performance of the EU Aquaculture Sector – 2012 exercise (STECF-13-03), Joint Research Group.
[45] MAGRAMA, Estadísticas Pesqueras 2011.
[46] Economic Maritime Fishing Survey and Aquaculture Economic Survey. Source: Ministry of Agriculture and Environment

Besides, marine biotechnology represents an attractive sector for investment in Spain, due to the great marine biodiversity found in its coasts and seas, including the Mediterranean sea, the Atlantic coast of Galicia and the Cantabrian Sea. Spain, through its local companies has already begun to create economic value for marine biotechnology and the country is open to develop new innovative projects with external invesments. Spain, being a country surrounded by sea, has a long experience in marine biology, and knowledge of their Biodiversity is a great attraction for the R&D sector.

The algology (the science of algae) is used by Marine Biotechnology not only to improve the species but to obtain algae using technological processes for the development of new food ingredients, cosmetics, drug development, bioremediation, biofuels (especially biodiesel) but also to develop new strategies to produce more clean energy . The sector is currently in an early development phase but this new discipline of Biotechnology has a long future ahead. Companies such as Pharmamar and other like Bioalgal Marine, Marine, CEAMSA, CEAMSA, BioFuel Systems and Seaweed BioFuel Seaweed Systems Canary are some clear examples of the different application of Marine Biotechnology to the industrial sector. BIOMAR has launched an innovative research project in the area of bioenergy: the project consists on the evaluation of 4,000 strains of microalgae based on their potential for biodiesel production. Biomar then selected several candidates to start their industrial development[47]. However, concrete information on ongoing projects in Spain as well as economic data could not be derived from our literature research.

The application of biotechnology in the design of transgenic plants, capable of growing in unfavorable environmental conditions or the creation of plant and pest-resistant seeds are examples of the increasing development of biotechnological applications. Marine Biotechnology employs new sources from marine organisms for industrial application and to develop new medical therapies. In Spain, its main user is the pharmaceutical industry, given its demonstrated positive results: the first antitumor drug developed in Spain comes from a marine organism, a tunicate, and has been developed by a pharmaceutical company called Pharmamar. Besides drug treatments, the obtention of new bioactive substances such as adhesives, biocompatible colloids, nanostructures and porous materials to produce new products or food ingredients, cosmetics, etc. are other products that are developed by the sector in Spain.

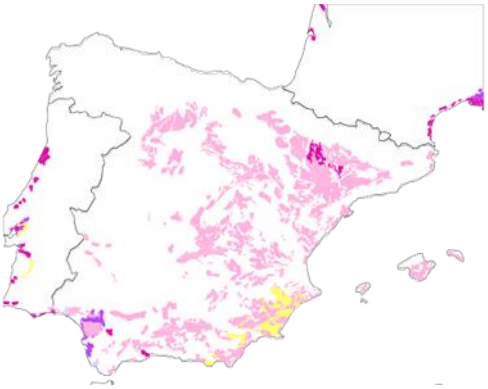
Agriculture in saline soils[48]

According to JRC, saline soils are found at various places along the Mediterranean coast of Spain. With regard to coastal areas, most activities (according to the map) are located in Andalucia, Valencia, and Catalonia and the Balearic Islands, with considerable activities also inlands, albeit out of the scope of the study[49]. Some other areas of the South East of Spain are identified as potentially salt affected. Furthermore, only in the irrigated zones of the whole territory, about 3% of the area is heavily affected by salinity problems.Saline soils occupy a much larger extension in Spain compared with the rest of Europe but they present alower salt concentration, with some exceptions (Ebro valley).

[47] Information from the Ministry of Economy and Competitiveness
[48] http://blog.agrologica.es/correcion-de-suelos-salinos/
[49] http://eusoils.jrc.ec.europa.eu/library/themes/Salinization/Resources/salinisation.pdf

Special attention should be given to the Delta del Ebro, where around 65% of its soils ared used for rice cropping[50]. Nonetheles, given the saline characteristic of its soil, irrigation techniques are performed introduce floods of fresh water during the period of maximum plant growth (April to September).

Figure 2.3 **Agriculture in saline soils occurrences in Spain**



Energy and raw materials

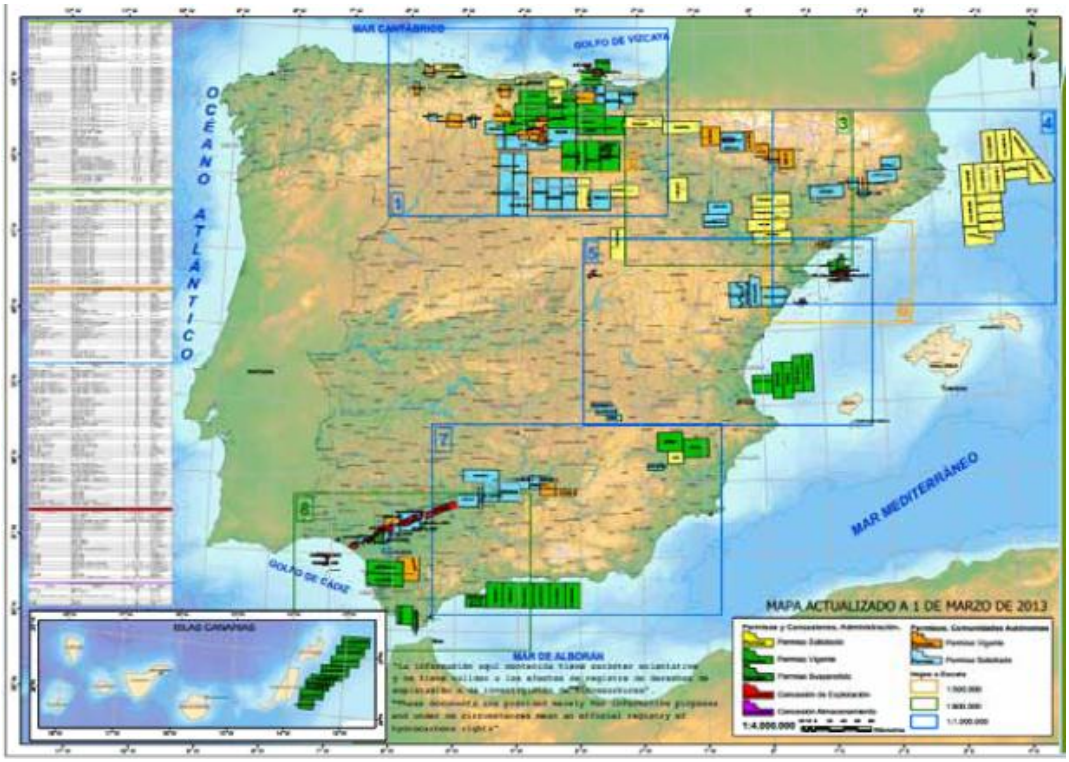
Offshore oil and gas

The first extraction survey was conducted in the Mediterranean sea in 1968. Two years later, Amposta was discovered, thus being the first Spanish navy oil field. Later on, in 1975, Casablanca, currently still in operation, was discovered. Up to date, it has produced over 150 m barrels[51]. Since then, a total of 11 commercial discoveries have been made in the country, mainly in the Mediterrenan Sea (near the coast of Tarragona and in the Gulf of Valencia) but also in the Atlantic arc (Gulf of Cadiz and Gulf of Biscaia). Also new discoveries have been made in the waters surrounding the Canary Islands. Moreover, and as shown in the figure below, as of March 2013, there are 25 offshore research permits in force, 8 offshore exploitation concessions, 2 underground storage gas and 12 research permits are still pending.

50 http://www20.gencat.cat/portal/site/parcsnaturals/menuitem.1942a21487b35eb0e6789a10b0c0e1a0/?vgnextoid=4861728d53b32210VgnVCM1000008d0c1e0aRCRD&vgnextchannel=4861728d53b32210VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default&newLang=es_ES and also the PLAN INTEGRAL DE PROTECCIÓN DEL DELTA DEL EBRO (Documento base- Julio de 2006).

51 Exploración y Producción de Hidrocarburos. Panorama de la industria offshore en España, March 2013 - ACIEP (The association that brings together energy companies engaged in the Exploration, Production and Underground storage of Hydrocarbons)

Figure 2.4 **Offshore oil and gas exploration sites in Spain**



Despite the extraction works performed so far, the Spanish territory is considered as very little explored, with high potential for petroleum and gas discoveries. Current GVA of the sector of oil and gas extraction is estimated at € 16 m, and generated by a total of 133 enterprises. At this respect, the estimated prospective resources following the assesment of the ACIEP[52] are:

- Oil potential resources in Spain are 2 000 MMBO (90% offshore) which is the equivalent of 20% of total oil consumptionoil in Spain for 20 years;
- Gas Potential resources (conventional and unconventional) in Spain are 2 500 BCM (15% offshore) which is the equivalent of 70 years of consumption in Spain.

Thus, Spain has in the Energy & Petroleum sector an opportunity to boost the economy and develop a domestic industry with high added value, generating investment, skilled labor and technological development[53].

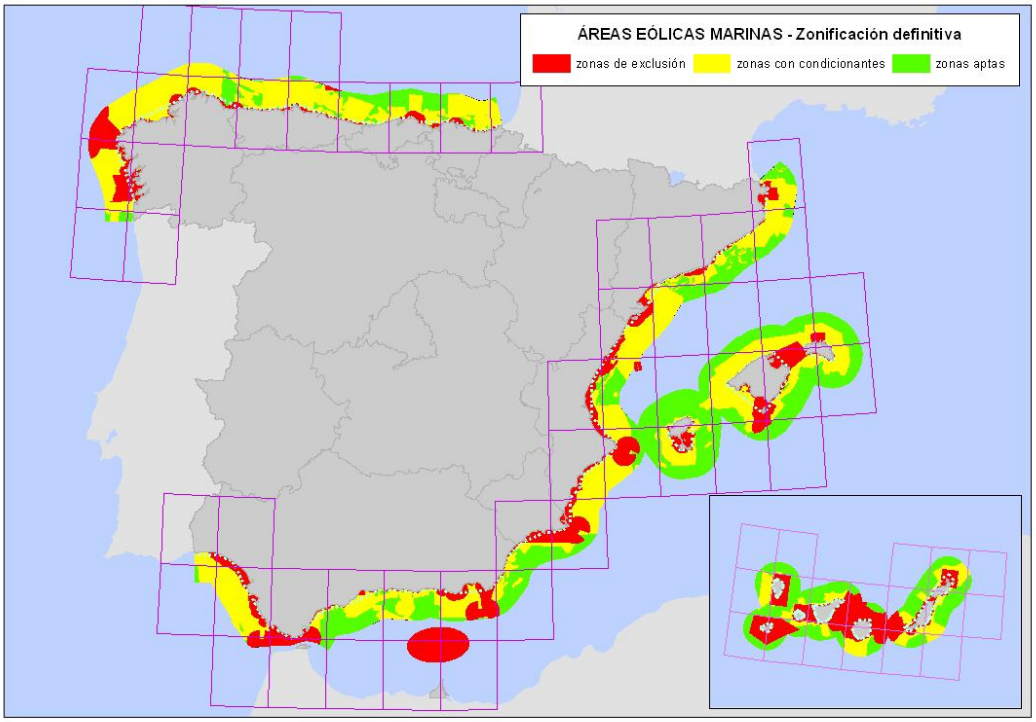
Offshore wind[54]

Even though there are around 30 offshore wind projects in the Spanish coast, some of them situated in Cadiz, Huelva, Castellón, Tarragona, La Coruña, Canary Islands, in Spain, there is currently no offshore wind farm in service. The depth of the Coastal waters in Spain explains why there are no offshore wind parks , until the floating technology achieves sufficient maturity.

[52] Exploración y Producción de Hidrocarburos. Panorama de la industria offshore en España March 2013 - ACIEP (The association that brings together energy companies engaged in the Exploration, Production and Underground storage of Hydrocarbons)
[53] Source : Exploración y Producción de Hidrocarburos. Panorama de la industria offshore en España, ASOCIACIÓN ESPAÑOLA DE COMPAÑÍAS DE INVESTIGACIÓN, EXPLORACIÓN Y PRODUCCIÓN DE HIDROCARBUROS Y ALMACENAMIENTO SUBTERRÁNEO
[54] Sources : Estudio del Impacto Macroeconómico de las Energías Renovables, Asociación de Productores de Energías Renovables | APPA
PERSPECTIVAS DE LA ENERGÍA EÓLICA MARINA EN ESPAÑA, INFORME BREVE PARA LA FEDERACIÓN DE INDUSTRIA DE CC.OO., Febrero 2012
Evaluación del potencial de las diversas fuentes de energía renovable y de las tecnologías para su aprovechamiento: oportunidades y retos para el sector de la energía, Universidad Pontificia Comillas, Instituto de Investigación Tecnológica Plan de Energias Renovables (PER) 2011-2020

Although there is a vast availability of public domain sea-land, the Spanish coastal conditions hinder the development of this technology, because of the real lack of suitable and shallow offshore locations near the coast. The following map shows in green the areas identified by the Ministry of Environment as suitable for offshore wind activities. Spain does not have offshore wind facilities and construction is not expected any time soon: due to its depth, the Spanish coast is not favorable to this type of facility due to the difficulties to realise foundations anchoring and power offtake works in deep water. In addition, the investment costs are still a drag in this type of infrastructure where financial contribution required for putting in place an offshore wind farm is three times that of a terrestrial park, and operating costs are five to six times higher.

Figure 2.5 **Offshore wind sites in Spain**



Source: Ministry of Agriculture, Food and Environement[55]

Furthermore, changes in the regulatory framework implemented in 2009 and 2010 along with the lack of definition on the remuneration of the wind in Spain[56], have lead to a climate of uncertainty in the sector. This has affected the activities of both offshore wind investors and energy providers, as well asequipment and component manufacturers. Ultimately, this hampered the development and investment in the wind sector. ☒

At this regard, the offshore wind technology would benefit from the development of specific concepts in the design, logistics, transport and assembly, etc. allowing the reduction of investment ratios and operating costs for maximum competitiveness. In particular, the implementation of experimental offshore R&D foundation substructures for midwater and deepwater floating designs is considered an asset to fuel the sector although, no commercially run test park is existing.

[55] http://www.magrama.gob.es/notas/documentos/Mapa%20e%C3%B3lico.pdf
[56] The new regulatory framework has been introduced by the Royal Decree Law 1/2012. The Royal Decree put an end to the price set at € 173.5 which was more than double the minimum guaranteed price for onshore wind energy.

Although, there are currently no offshore wind powers installed, recent improvements have been made in pilot-testing with the launch of the Zéfir Test Station project, an experimental offshore wind platform developed in waters adjacent to the port of Tarragona. This demonstration project is expected to produce up to 20 MW in the following years, becoming the first offshore wind power in Spain.

Complementarily, the Spanish Maritime Cluster believes that the domestic industry should leverage its competitive advantages, most especially the large international experience in the shipping industry and enormous prestige in the wind sector (terrestrial), for position it-self in this activity. According to their forecasts this subsector could employ up to 10 000 workers in the next eight years.

The R&D effort is reflected in the wide participation of Spanish wind companies on European research and development projects such as MARINET (2011-2015), focused on the study of offshore renewable energy conversion systems, including offshore wind. The project involves more than twenty Europeancompanies and universities, including Spanish entities.

Ocean renewable energy[57]

Spain has significant marine energy potential in the atlantic coast, where wave energy resource has great quality for viability and development given the characteristics of our coast, in contrast with Marine energy, along with solar thermal, experienced a higher growth rate during the last years. Marine energy is in a research phase, focusing mainly in demonstration projects in order to determine the most efficient prototypes to be marketed.

Some of them are the project Ibermar in Cantabria[58] currently in a demonstration stage delivering first results[59,] BIMEP (The Biscay Marine Energy Platform)[60] in the port of Biscay in the Basque Country to be inaugurated next year, with an overall power of 20 MW.

The platform consists of4 test berths or power connection units of 13 kV and 5 MW respectively.

On the other hand, the MutrikuWave Energy Plant[61] is already in operation and connected to the grid since the 8th July 2011. The plant has a capacity of 300 kW from 16 turbo generator sets. With regard to technology, the industry has focused mainly on wave technology (waves) and currents, although most of them still in a development stage. The current technology progress implies high generation costs that makes ocean renewable energy not competitive if compared to other non-fossile energy sources. In the Canary Islands, in the port of Arinaga an offshore prototype wind turbine has already been installed of 5MW and a new infrastructure the Ocean Platform of the Canary Islands (PLOCAN) has been established to house a testbed for harnessing ocean energy.

[57] Plan de Energias Renovables (PER) 2011-2020
Estudio del Impacto Macroeconómico de las Energías Renovables, Asociación de Productores de Energías Renovables | APPA
[58] The Ibermar project is a floating platform prototype. See also:
http://www.medioambientecantabria.es/documentos_contenidos/22822_3.Parte1.pdf
[59] Wave Energy Centre (www.wavec.org), Principais Players Mundiais
[60] The The Biscay Marine Energy Platform (bimep) is an open sea test infrastructure for research and demonstration of offshore Wave Energy Converters (WEC). The facility will offer the opportunity for testing full-scale prototype devices as single devices or arrays in order to assess and monitor performance. See also: http://www.fp7-marinet.eu/EVE-biscay-marine-energy-platform-bimep.html
[61] See also : http://www.eve.es/Promocion-de-inversiones/Proyectos-en-desarrollo/Mutriku.aspx

At the national level, a considerable commercial and industrial fabric is arising, reinforced by the significant commitment of business and technology sector, and the support of various regional administrations. In short, the national development of of different technological demonstrations suggests a major industrial growth in the energy area of the sea.

At this regard, the Renewable Energy Plan 2011-2020, that makes a rigorous analysis of the sector and identifies the barriers that have prevented the development of marine energy, estimates a marine energy production of 220 GWh in 2020. It also establishes a series of Specific Priority Actions to save these barriers and to promote the implementation of 100 MW of ocean energy and 750 MW of offshore wind by 2020. For all this and for having the adequate natural conditions (level of appeal, continental shelf and level climatological, etc.). Spain has significant potential to lead global development in marine energy.

Carbon Capture and storage[62]

Although carbon capture and storage is an emerging technology, there are currently no projects in the maritime areas. However, one initiative has been launched in Castilla-Leon, an in-land Spanish region. CIUDEN[63], the Energy City Foundation, in Castile and Leon and under the authority of the Ministry of Industry, Energy and Tourism, has developed the technology that has permitted to successfully completed CO^2 capture in oxycombustion in Spain. Although the project is still in a developing stage, this means the starting point of a new public-private partnership phase that will foster economic sectors, with high level of CO^2 emitting and promote the creation of new economic industries through the transfer and technological dissemination to the productive sector.

Mining[64]

The Spanish Coastal Law[65], article 90, speficically forbids the extraction of arid aggregates, considered a serious misconduct and punished with a fine of € 20 per m2.

Marine Minerals mining

The Geological and Mining Institute of Spain (IGME) is tasked to research the marine minerals stocks in Spain and make the knowledge available to the private sector, with the main objective of promoting business for the exploitation of marine mineral resources.

Among the recent discoveries made by this institute, it is important to mention the fields of iron and manganese nodules rich in nickel and cobalt found in the Gulf of Cadiz and in the Alboran Sea. In Galicia, the IGME has discovered a variety of iron nodules, polymetallic manganese and phosphorite crusts. Also in Galicia and in the Bay of Biscay some nodules and gas discoveries have been made. The exploration phase is starting in the Canary Islands and it is expected to prove the existence of this kind of materials.

Desalination[66]

Spain is one of the world's leading countries in water desalination activities and desalinisation plants building, with main construction companies operating in the field: Spanish construction

62 Source : CIUDEN, Ciudad de la Energía
63 The project is still in a developing stage. For more information please refer to: http://www.ciuden.es/index.php/es/comunicacion/noticia/es/29-comunicacion/noticias-tecnologias/711-ciuden-comienza-la-construccion-de-los-pozos-de-observacion-e-inyeccion-de-co2-de-su-planta-de-desarrollo-tecnologico-en-hontomin-prueba
64 Source: Los Fondos Marinos: lanueva frontera, IGME
65 Law 2/2013, de 29 de mayo, for the Proctection and sustainable use of the Litoral, that modifies the Law 22/1888, for the Regulation of Spanish Coasts.
66 Source : La desalinización en España, Cuadernos sectoriales. Enero de 2007 http://www.spaintechnology.com/icex/cda/controller/pageGen/0,3346,1559872_6406659_6410324_4648052,00.html, España, Technology for life, ICEX

groups such as Acciona, Ferrovial, FCC and Sacyr operate large projects in the business of water desalination not only at the national level but also in the world. These construction groups have proven capability in the design, construction and facilities management, as well as experience in structuring project finance and national engineering quality.

At this regard, Spain is the fourth country in the world in installed desalination capacity, with around three million cubic meters per day and 700 desalination plants installed all over the country.

In 2010, those regions with higher volumes of desalinated water in terms of their capacity were the Canary Islands (737,374 m3/day), Catalonia (579,998 m3/day) and Andalucía (541,044 m3/day), followed by Murcia (423,148 m3/day) and Comunidad Valenciada (353,1120 m3/day). With the exception of the Canary Islands, desalinisation plants are concentrated in the Meditearrean Arc, where traditionally the level of water reservoir levels is low.

Leisure and tourism

In 2012[67], a total of 57.7 m international tourists visited Spain, ie 2.7% more than in 2011. Overall, this presents the third best number of international tourists ever recorded, behind figures of 58.7 (2007) and 58 (2006) m arrivals, respectively. In the January-November 2012 period, international tourists spent about € 53 bn, representing an increase of 6% over the same period in 2011.

With these figures, Spain is now the world's fourth destination in international tourist arrivals behind France, the U.S. and China, and the second in international tourism receipts after the United States, (UNWTO World Tourism Barometer). According to estimates of the World Tourism Organization (WTO), global tourism will grow annually by 3.3% on average until 2030, with increases of around 40 and 42 m passengers a year. Europe is the most visited continent, and receives 500 million international visitors each year.

Coastal tourism[68]

Tourism in Spain is mainly focused on the so-called “sun and beach” (“sol y playa”), i.e. on coastal and maritime tourism. The number of bedrooms and bed-places in coastal regions represents 75.6% of the total lodging capacity of the country.[69] The prime accommodation establishments are concentrated in the coastal regions of Balearic Islands, Las Palmas, and Barcelona, followed by the capital city of Madrid. Figures for the period 2007-2009 also show that the regions where the number of nights spent in touristic accommodation is the highest are the capital city of Madrid, and the coastal regions of Catalonia, Andalucía, Comunidad Valenciana and Balearic Islands, thus stating the relevance of coastal tourism for the country.

The model has developed since the beginning of the sector’s expansion in the 50’s. It is based on an extensive standardized supply and competence in price, resulting in the product turning into a commodity. The emergence of new tourism destinations that offer the same product at a smaller price (African Mediterranean countries, Turkey etc) has implied a dramatic lost in the sector

[67] Source: PwC study: tourism hot topics 2013
[68] References: National Integral Tourism Plan (2012-2015),
Article “Coast tourism: lines of action for achieving sustainable development” by Dr. Silvia Sanz Blas, published by the Institute of Tourism Studies
Report on tourism perspectives for 2013 (Exceltur)
Report “Impacts over the environment, economy and employment of the different tourism development models in the Spanish Mediterranean Coast, Balearic Islands and Canary Islands”.
Exceltur September 2005. / Article “Coast tourism: lines of action for achieving sustainable development” by Dr. Silvia Sanz Blas, published by the Institute of Tourism Studies Article “Coast tourism: lines of action for achieving sustainable development” by Dr. Silvia Sanz Blas, published by the Institute of Tourism Studies
National Integral Tourism Plan (2012-2015).
[69] For a definition of coastal regions, please see above (0.2 coastal regions) and here: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Coastal_region.

competitiveness. Although the "sun and beach" tourism, the classic choice for the Spanish industry, concentrates 48 million international tourists in the country each year, the fact that 50% of trips made across the globe annually are motivated by other tourist segments, the need to turn the sun and beach tourism model into a more sustainable activity is recognized and shared. Nonetheless, there is not yet a strategy to achieve it, even if some local initiatives have taken place.

There are environmental problems in some parts of the coast, due to high pressure over the limited resources They derive from the increase of the coastal visitors' number and the increase of accommodation supply. This implies environmental conflicts and problems and a reduction of the overall coast tourism product quality, thus reducing the competitive advantage over the potential competitors. Hence, the current challenge in Spain to advance towards a more sustainable tourism model in the coast to respond to a more experienced tourism demanding an overall higher quality product. There is currently a too standardized tourism supply in Spain that fails to cope with an increasingly complex tourism demand. The coastal tourism supply in Spain is too standardized and does not respond to the new increasing demand for specific tailor made and more "authentic" products. There is a need for supply diversification: new products based on recreational or sports boating, wellness tourism and to enhance the cultural attractive and heritage including gastronomic and enologic culture, as well as the cultural heritage itself.

Coastal tourism experiencies have too seasonal demand ("seasonalization") with several consequences: Coastal and maritime tourism demand in Spain is too concentrated in the summer season. This has implied an increase in the supply necessary to cope with the high demand during the summer, resulting in pressure on the infrastructures and excess of waste production. The rest of the year, there is an excess of supply and tourism infrastructure under-use. Another consequence is the high sensitivity to the economic cycle and the low access to durable and qualified jobs, as the job careers are short and discontinuous (difficulties in promotion and training).

Yachting and marinas

In 2011, a total of 126 950[70] berthing places were under concession in Spain, that spread over the 355 marinas located along the 7 900 kilometers of Spanish coastline. Out of those, 30 170 are located in Catalonia, followed by the Valencia Region and Balearic Islands. This is an increase of more than 40% if compared with the number of berths recorded in 2003.[71] In the first two cases there is a great demand for berthing places, which gradually meet the demand with new marinas build in the Catalan Community, but not so in the Balearics, where the offer remains short due to the high demand generated largely by foreign shipowners who wish to have their boat in the islands. In fourth position in the list is the Andalusian Community with 17 670 berths and with future increases ahead, as the community is by far the one with more miles of coastline.

Cruise tourism[72]

Although the Spanish economy entered a second recession in 2012, the economic contribution of the cruise industry in Spain was € 1 255 m this is the fourth european market in terms of revenue. In addition, Spanish ports welcomed € 5.2 m European cruisers (adding scales and shipments) and ranks second at the European level. This means that 1 in 5 passengers who boarded in Europe did it from a Spanish port. Also, 576 000 spanish citizens enjoyed a cruise ride in 2012.

[70] Source: http://www.fondear.com/Todo_Empresa/Puertos_Links/Puertos-Deportivos.htm
[71] The increase in the number of berths from 130.555 (2011) in comparison to the baseline year 2003 with 92.694 berths represents an increase of 41%. Please see also: http://www.feapdt.es/wp-content/uploads/2010/11/art138_2.pdf
[72] Sources :Informe Anual de Contribución Económica 2013, CLIA, Cruise Lines International Association, Europe
Article "The maritime cruises market in Spain: a historical perspective" (1994-2004)" by Arturo Paniagua Mazorra, published by the Institute of Tourism Studies. Point V "Conclusion" http://www.tendencias21.net/Barcelona-afianza-su-liderazgo-internacional-en-el-turismo-de-cruceros_a19891.html

Despite all this, the maritime cruises sector in Spain has a small market share in the total tourism sector. It is a market with extremely high entry barriers (high fixed costs, demand for technology and capacity to build the cruise ships). These have made it difficult for Spanish companies to have a significant presence in the national market. The situation has changed in the last 15 years, though there is still a need to diversify the supply in order to adapt it to a more mature demand (the product is at the moment too standardized into cruises leaving from Barcelona Port offering a Mediterranean cruise including 7 nights on board).

The market is experiencing strong growth rates and the market share of Spanish companies has increased in the last years as Iberojet Cruises has become an important market player. Since the 2008 crisis, us the cruise industry has continued to generate more and more jobs despite the recession, from 22 397 in 2008 to 26 389 new jobs generated in 2012[73] both at sea and land, this is an increase of around 18%. On the other hand the disbursement of the industry has also increased from € 1 078 m in 2008 to € 1 255 m in 2012, ie increased by 16%.

In relation to domestic ports, in the mediterranean area, Barcelona and Balearic Island account for 77% the cruise tourism in Spain Mediterranean areas, and they account fo 54% of the total in Spain (both Atlantic and Med regions), in 2010 followed by the Port of Málaga (+35%) 650 000 passengers as per data from the Ministry of Public Works. The Port of Valencia has experienced a considerable increase in the volume of cruise scales, from 253 743 passengers received in 2010 to 480 233 in 2012. This represented an increase of 89%. To the same extent, the Balearic Islands have increased the cruise passenger's traffic, from 1 546 739 in 2010 to 1 608 704 in 2011, with 723 cruise lines layovers in 2010 to 745 in 2011. Meanwhile, Barcelona remains to be the first European port in term of cruise passenger's traffic, with a total of 2.4 million passengers visiting the port of Barcelona in 2012; this is 2.4% more than in 2010. The Barcelona Tourist Office has estimated that during the year 2012 cruise segment caused an economic impact equivalent to € 232 m in the area.

On the other hand, according to the data published by the Ministry on their website, the growth over the last years has been spectacular in the Atlantic Ports (+23%) from 589 688 passengers in 2009 to near 725 000 in 2010, with special mention to the Bahía de Cádiz (+42%) with more than 334 000 and Vigo (+5%) with 233.000 passengers. Moreover, las Palmas and Tenerife account for 1.3 million of passengers, increasing 13,7% between 2009-2010.

On the other hand, in September 2014, Barcelona will host the Seatrade Med, an event regarded as the second world's fair cruise sector, bringing together the industry's leading specialists. The occasion will also bring to the Catalan city the Oasis of the Seas, the largest passenger ship in the world. With both events, Barcelona will strengthen its leadership in cruise tourism segment at continental and global level. In the same line, the administration of the port of Barcelona expects to reach 2.6 million visitors through cruises in 2013, thus approaching the record set in 2011, when it reached 2.65 million cruise passengers. The increased activity has been notable in recent months, since last January to April was an increase of 30 percent compared to the same months of 2012.
Spain excels a target market for cruise tourism, and hosts many cruise lines and companies and their offices in the Spanish territory. In addition to this fact, growth in other related categories, such as shipbuilding and cruise purchases is also significant. The latter markets rose sharply in 2011, and reached 6%. As for the other parameters, growth slowed down in 2012, but experts are optimistic about its recovery during 2013 and 2014.

[73] THE CRUISE INDUSTRY: Contribution of Cruise Tourism to the Economies of Europe 2013, European Cruise Council- CLIA.

Coastal protection

Coastal protection

In may 2010, Spain represented over 6% of the total marine High Importance Area of the EU[74]. As of 31st of December 2010, the number of sites of Community importance declared by de country rose up to 1 446 with a total area of 12 622 994.2 ha (11 592 488.6 ha land and 1 030 505.6 ha marine), which represents 22.9% of the total terrestrial area. For the same period, Spain had 1 034 km2 of marine Special Bird Protection Area, thus included in the Natura Network 2000, which places the country in the rank 12 out of 27[75].

The General State Budget for 2012 assigned to the "Program 456d.Acting on the Coast" managed by the Department of Sustainability of the Coast and the Sea, the sum of € 78 716 680 financing investments for coastal protection activities[76].

Maritime monitoring and surveillance

In the field of maritime surveillance and monitoring Spanish coastal border protection competences are commissioned to the Central Administration, with a further allocation of responsibilities as follows:

- Spanish Guardia Civil; Reponsible, in the territorial waters as well as in international waters according to international treaties, for enforcing law in order to prevent, pursue and investigate criminal acts that threaten citizens rights and public security; as well as is responsible for protecting and guarding the custody of coasts and ports; maritime borders surveillance; irregular migration control; prevention of illegal trafficking of goods and drugs smuggling at sea. The Guardia Civil has high specialized professional teams and sophisticated technical equipments dedicated to maritime monitoring, surveillance and intervention such as the SIVE (Exterior Integrated Surveillance System), maritime patrol vessels, maritime patrol aircrafts and helicopters, being all of these means coordinated from the GC National Coordination Centre (NCC). On the other hand, under signed agreements with other administrations at national level, the Guardia Civil, has also responsabilities, among others, in fishery control; maritime environment protection; the inspection of sport boats; protection of the underwater historic heritage; and search and rescue activities;
- Puertos del Estado; Responsible for the planning, standardisation, coordination, inspection and control of the country's marine aids to navigation system as well as training, research and technological development and innovation. The ATON coastal network encompasses 3,800 entities, including State Port Authorities, Regional port, Fish Farms, Pipes, Ados and other organisations;
- Dirección General de la Marina Mercante, within the Ministry of Fomento; Responsible for maritime surveillance and pollution. SASEMAR (Salvamento y Seguridad Maritima is the public enterprise in charge of maritime safety. SASEMAR has a fleet of 4 polivalent maritime safety vessels,and 10 tugboats, 4 patrol boast and 55 vessels for rapid safety interventions and a total of 1 562 workers[77];
- Instituto Hidrográfico de la Marina; Responsible for Nautical documentation and charting;
- Ministry of Agriculture, Food and Environment; Responsible for coastal border protection (shoreline and beaches) as well as responsible for the environmental protection of the marine environment through the Division for the Protection of the Sea (implementation MSFD).There is a national system for the protection of the sea (Sistema nacional de Protección de la Ribera

[74] MAGRAMA, 2010. Informe Calidad y Medio Ambiente
[75] MAGRAMA, 2010. Informe Calidad y Medio Ambiente
[76] MAGRAMA, 2013. Memoria de Actividades del MAGRAMA durante 2012.
[77] Sociedad de Salvamento y Seguridad Marítima, 2011. Informe Anual 2011.

del Mar), regulated by the Marine Environment Protection Act[78]. At this regard, the environmental monitoring is mainly done by the Instituto Español de Oceanografía (IEO), the Centro de Estudios de Puertos y Costas del (CEDEX), and Puertos del Estado.

Furthermore, in the last years a high number of Spanish firms have proliferated in the sector of marine security and defence, thus facilitating high technological and management services, including equipment systems for the interception and assistance of illegal migration, prevention and detection of criminal activities, and assistance to marine casualties. As an example, in 2011 the Spanish space industry continued expanding, the trade industry group representing more than 20 space companies operating in the country. A large share of exports on overall sales is in part responsible for Spain's space sector resilience in the current economic situation.[79.] On the other hand, Spanish shipyards have extensive experience in the production of auxiliary vessels to support the activities of naval forces (surveying ships, hospital vessels, oil tankers, etc.) and non-military vessels whose features could be of interest in certain military or police operations. These include oceanographic research and seabed survey vessels, salvage tugs, fast rescue craft and technologically advanced special offshore vessels, which include support ships for ultra-deep diving, for ROV[80] operation, etc.

After the major pollution maritime catastrophe suffered in the north of the country, the Prestige sinking in 2001 which represents a public investment of €1 000 in cleaning and recovery activities[81,] limited efforts have being put in place in order to safeguard the integrity of natural and economic resources in the coastal area established by international regulations, consistent in developing new emergency and assistance protocols to ship accidents aiming to ensure adequate, prompt and effective compensation for damage to persons and property, costs of clean up and reinstatement measures and economic losses resulting from the maritime transport of hazardous and noxious substances At this regard, Spain does not have any specialised equipment for the monitoring of marine spills of Hazardous and Noxious Substances (HNS). However, it has aerial and vessel surveillance available. On the other hand, Spain's capability for responding to marine incidents involving HNS at sea is rather limited and mainly relies on the same resources as for oil pollution response and on special occasions on resources from private companies[82].

2.2. Breakdown of maritime economic activities at regional level (NUTS 1 or NUTS 2) and allocation to different sea-basins

This section allocates the data from Table 2.1 to maritime regions in the country. The results of this analysis are intented to provide a breakdown of maritime economic activities at regional level and to assess maritime regions.

The breakdown of economic activities is done at NUTS 1 or NUTS 2 level, depending on the availability of data. Besides, the level of regional analysis is determined by where maritime policy strategies and funding programmes are decided (please see suggested level highlighted in bold).

[78] Ley 41/2010 de Protección del Medio Marino, http://www.magrama.gob.es/notas/documentos/Mapa%20e%C3%B3lico.pdf
[79] INFODEFENSA Junio 2013.
[80] INFO DEFENSA
Junio 2013.
[82] EMSA 2013. Inventory of EU Member States' Policies and Operational Response Capacities for HNS Marine Pollution 2013

Table 2.2 Breakdown of maritime economic activities at regional level

EU Member State	NUTS 1	NUTS 2	Geographical allocation to Sea-basin (NUTS 2 regions)
Spain	Noroeste	Galicia	Atlantic Arc
		Asturias	Atlantic Arc
		Cantabria	Atlantic Arc
	Noreste	Basque Community	Atlantic Arc
	Este	Catalonia	Mediterranean Sea
		Valencian Community	Mediterranean Sea
		Balearic Islands	Mediterranean Sea
	Sur	Andalusia	Mediterranean Sea
		Region of Murcia	Mediterranean Sea
		Ceuta	Mediterranean Sea
		Melilla	Mediterranean Sea
	Canarias	Canary Islands[83]	Atlantic

Table 2.3 presents the percentage share of each region in the per specific maritime economic activity. This share can be applied both to the GVA figures and the employment figures in Table 2.1. As hardly any data can be found in regionalised statistics allocation has been done on the basis of other parameters. The methodology used is explained is footnotes to the table.

Table 2.3 Overview of employment and GVA percentages per maritime economic activity per region in Spain[84]

Sea-basin		Atlantic Arc					Mediterranean Sea								
NUTS I		Noroeste				Canarias	Este			Sur				OTHER (non-maritime regions in Spain)	Qualitative description of the split
Regional percentages to apply on GVA and employment		Galicia	Asturias	Cantabria	Basque Country	Canary Islands	Catalonia	Valencian Community	Balearic Islands	Andalusia	Region of Murcia	Ceuta	Melilla		
0.	**Shipbuilding**														
0.a	Shipbuilding and repair[85]	28 %	17%	6%	22%	6%	6%	6%	6%	6%	0%	0%	0%	0%	
0.b	Construction of water projects[86]	25 %	3.3%	0.7 %	7.7%	3.7%	17. 5%	9.7 %	9.6 %	12. 5%	3%	0.4 %	0%	0%	Source: Management report of the state-owned port system 2011
1.	**Maritime transport and shipbuilding**														
1.a 1.b	Deep-sea shipping Short-sea shipping[87]	7%	5%	1%	7%	8%	17 %	18 %	3%	28 %	5%	0%	0%		
1.c	Passenger ferry services[88]	1%	0%	1%	1%	24%	14 %	4%	21%	25 %	0%	7%	2%		
1.d	Inland waterway transport	0%	0%	0%	0%	0%	0%	0%	0%	100 %	0%	0%	0%	0%	The only inland waterway port is Sevilla Port that concentrates all the inland waterway transport.
2.	**Food, nutrition and health**														

[83] The Canary Islands (NUTS 2) will be assessed separately from the other NUTS 2 regions in Spain, due to the specific nature of the maritime economic activities and indicators.
[84] Under **'Others'** those regions (and the respective breakdown) in a given EU Member State are listed which are not sea-adjacent.
[85] Main shipbuilding companies per turnover- Number of companies per region. Source: ICEX
[86] Investment in infraestructure and port capacity, 2011
[87] Tones of freight. Source: National Statistics Institute (data for 2011)
[88] Number of maritime passengers carried. Source: National Statistics Institute (data for 2011)

Sea-basin		Atlantic Arc					Mediterranean Sea								Qualitative description of the split
NUTS I		Noroeste				Canarias	Este			Sur				OTHER (non-maritime regions in Spain)	
Regional percentages to apply on GVA and employment		Galicia	Asturias	Cantabria	Basque Country	Canary Islands	Catalonia	Valencian Community	Balearic Islands	Andalusia	Region of Murcia	Ceuta	Melilla		
2.a 2.b	Fisheries for human consumption and animal feeding[89]	46%					16%							38%	
2.c	Marine aquaculture[90]	86 %	0%	1%	0%	1%	4%	2%	0%	3%	2%	n/a	n/a	1%	
2.d	Blue biotechnology	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		No data available
2.e	Agriculture on saline soils	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		According to JRC, saline soils are concentrated mainly in the mediterranean basin, the west of Spain (south atlantic) and in the non-maritime regions. There are no saline soils in the north atlantic arc (bay of Bsicay)
3.	**Energy and seabed materials**														
3.a	Offshore oil and gas	27%					73%							0%	Among 11 commercial discoveries in Spain, 8 are located in the Mediterranean Sea (Valencian Gulf and near the coast of Tarragona) and 3 are placed in the Atlantic Arc (Gulf of Biscaia (2) and Gulf of Cadiz (1))
3.b	Offshore wind	27 %	55%	0%	0%	33%	5%	5 %		22 %					No offshore wind parks in Spain. Among 72 potential offshore wind areas identified by the Ministry of Agriculture and Environment, 9 of them have been ratified by promoters (Galicia, Asturias, Andalucia, Valencia, Catalonia, Canary Islands). The first offshore wind park is being built in Tarragona (Catalonia)
3.c	Ocean renewable energy	12 %	12%	12 %	12%	37%	12 %								R&D projects in Catalonia, Basque Country, Cantabria, Canary Islands (3 projects), Galicia and Asturias
3.d	Carbon capture and storage	0%	0%	0%	0%	0%	0%	0 %	0%	0%	0%	0%	0%	100%	There is a project that has successfully capturated CO2

[89] Direct data from the Economic Maritime Fishing Survey. Source: Ministry of Agriculture and Environment
[90] Direct data from the Economic Maritime Fishing Survey and Aquaculture Economic Survey. Source: Ministry of Agriculture and Environment

Sea-basin		Atlantic Arc					Mediterranean Sea								
NUTS I		Noroeste				Canarias	Este			Sur				OTHER (non-maritime regions in Spain)	Qualitative description of the split
Regional percentages to apply on GVA and employment		Galicia	Asturias	Cantabria	Basque Country	Canary Islands	Catalonia	Valencian Community	Balearic Islands	Andalusia	Region of Murcia	Ceuta	Melilla		
															capture in oxycombustion in El Bierzo (Castilla y León)
3.e	Mining (sand, gravel, etc.)	100%					0%							0%	
3.f	Marine minerals mining														Recent discoveries mainly made in the Atlantic Arc (Galicia and Bay of Biscay).
3.g	Desalination[91]	0%	0%	0%	0%	25%	20 %	12 %	7%	18 %	14 %	1%	1 %	2%	
4.	**Leisure, working and living**														
4.a	Coastal tourism[92] (accommodation)	4%	2%	1%	2%	16%	16%	8%	13 %	17 %	1%	negli gible	ne glig ible	19%	
4.b	Yachting and marinas[93]	8%	1%	3%	3%	6%	26%	17 %	15 %	15 %	5%	1%	0%		
4.c	Cruise tourism[94]	6%	0%	0%	0%	36%	25%	6%	9%	14 %	1%	0%	0%	0%	
5.	**Coastal protection**														
5.a	Coastal protection[95]	8% of maritime zone protection spread among the different sea basins out of total 12 622 994.2 ha protected (both land and maritime)												92% of total protected area	
6.	**Maritime monitoring and surveillance**														
6.a 6.b 6.c	Maritime surveillance	20 %	5 %	3 %	3%	18%	8%	7%	15 %	13 %	3%	0.34 %	0.1 5%	0%	Regional data has been estimated evenly base don the lenght of the coastline. However, it is important to take into account that the protection against ilegal movement of people is particularly important in the Canary Islands and in the Gibraltar Strait and Alboran Sea (Andalucia). Also the Strait and also Galicia have important activity in terms of fighting against illicit trafficking of goods, mainly illegal drugs..

[91] Installed desalination capacity operational in 2010, source: Environmental profile of Spain 2010, Ministry of Agriculture and Environment
[92] Number of nights spent in touristic accommodation establishments by each NUTS 2 region in the country (National Statistics Institute)
[93] Number of berths. Source: www.buscoamarre.com (data for year 2012)
[94] Total cruise passangers in the different ports (year 2011). Source: Puertos del Estado
[95] Quality and environment report from the Ministry of Agriculture and Environment (2010)

3. Ranking the 7 largest, fastest growing and promising maritime economic activities

The following sections are aligned with the methodology of the Blue Growth study, as requested by DG MARE. A list in ranking order of the 7 largest, 7 fastest growing and 7 most promising prospective maritime economic activities at country level is provided. This part of the study relies on statistical information gathered and supplemented with the insights of the sector editors and the country editors.

3.1. The 7 largest Maritime economic activities

This subchapter identifies the largest maritime economic activities with a ranking order. On the basis of the scores obtained in relation to GVA and persons employed, the 7 largest maritime economic activities have been identified as follows:

Table 3.1 **Listing the 7 largest maritime economic activities in Spain at country level**

Rank	Maritime economic activities	GVA (€ m)	Employment	Score
1.	Coastal tourism	6 596	206 397	136.2
2.	Catching fish for human consumption	3 720	129 230	83.2
3.	Shipbuilding (incl. leisure boats) and ship repair	1 391.5	24 122	19.0
4.	Construction of water projects	944.5	19 813	14.6
5.	Short-sea shipping (incl. Ro-Ro)	649.1	9 262	7.9
6.	Deep-sea shipping	621.1	8 864	7.5
7.	Passenger ferry services	353	5 582	4.6

3.2. The 7 fastest growing Maritime economic activities over the 3 past years

This subchapter identifies and selects the 7 fastest growing maritime economic activities as emerged **over the past 3 years** (see also Annex II). This part of the analysis is important for forecasting future trends. The analysis entails the aggregation and assessment of quantitative data for the maritime economic activities, applying the same approach as in the previous task on statistical information gathered supplemented with the insights of the sector editors and the country editors where applicable.

The CAGR (compound annual growth rate) has been calculated taking into account the GVA and employment figures for 2008, 2009 and 2010. Those figures are not available for all activities, but just for eleven of them and therefore the above ranking of the 7 fastest growing maritime activities has been calculated taking into account only the available data.

Table 3.2 **Ranking order of the 7 fastest growing maritime economic activities in Spain**

Rank	Maritime economic activities	Growth 2008-2010 (CAGR)	Growth 2000-2012 (CAGR)
1.	Offshore Oil & Gas	9.1%	-8.3%
2.	Cruise tourism	8.0%	18.5%
3.	Fisheries for human consumption	-2.5%	5.5%

Rank	Maritime economic activities	Growth 2008-2010 (CAGR)	Growth 2000-2012 (CAGR)
4.	Fisheries for animal feeding	-2.5%	5.5%
5.	Short sea shipping	-2.9%	3.7%
6.	Passenger ferry services	-4.0%	-1.2%
7.	Coastal tourism	-4.8%	1.5%

3.3. Identification of promising maritime economic activities

The selection of maritime economic activities which hold a clear promise towards the future, even if they might be small today, is done on a number of criteria. The most important element aspect is the innovation level of the sector. The innovation level of maritime economic activities is analysed on the basis of a number of innovation criteria. The scoring on innovation is complemented with a set of other criteria, which are qualitatively scored, to arrive at a more comprehensive insight of the potential of a maritime economic activity.

3.3.1. Innovation indicators

The innovation indicators are inspired by the recent communication on innovation indicators which aim to capture the innovation level of a country[96]. The following two indicator sets are included[97]:

Indicator	Explanation	Source
Technological innovation		
1. Scientific publications	Number of scientific publications in a MAE in a Member State in relation to the GVA (€ mln) of that maritime economic activity[98].	Thomson Reuters (2011)[99]
2. Patents	Number of patents in a MAE in a Member State in relation to the GVA (€ mln) of that maritime economic activity.	Thomsons Reuters (2011)
R&D expenditure		
3. R&D expenditure/GVA	R&D expenditure as a percentage of value added[100] (2007 and most recent available year).	OECD, ANBERD database
4. RTD expenditure/turnover	R&D expenditure as a percentage of company turnover. Data are available for UK only.	Amadeus company database

In addition to the above indicators a number of studies and reports have been identified that contain information on innovation potential per sector/maritime economic activity. A qualitative assessment of these reports is provided beneath.

Table 3.3 Identified national sources on maritime innovation

Source	Qualitative assessment regarding innovation potential per maritime economic activity/sector
"Agricultura y pesca", Informe sectorial 2013 - Barcelona Activa ("*Agriculture and Fishery", Sectoral Report 2013- Barcelona Activa*)	**Marine aquaculture** Spain pioneers the transformation of traditional fisheries sector to the current aquaculture. In this sense, it is one of the territories of the European Union where there is a strongest support for the development and expansion of this activity. The technical and biological advances have improved sector instruments, both in the field of agriculture and in the field of fisheries and aquaculture, which has resulted in increased efficiency and reduced costs production. In addition,

[96] European Union, 2013: Measuring innovation output in Europe: towards a new indicator. COM(2013)624 final
[97] Dependent on data availability
[98] For small economic activities a default value of € 1 million has been used. The analysis was performed for 10 MEAs.
[99] Analysis carried out in 2011 by Ecorys in the context of the general Blue Growth study. The analysis is based on Thomson Reuters data.
[100] This indicator can be calculated for a few sectors only and are in most cases expressed at a higher sector level (e.g. oil & gas as part of the larger sector mining & quarrying). Only for shipbuilding a relatively straightforward match can be reached.

Source	Qualitative assessment regarding innovation potential per maritime economic activity/sector
	technological developments applied to the sector have helped to reduce the physical effort required to develop related occupations, and increase the possibilities of access to natural resources.
"Estudio del Impacto Macroeconómico de las Energías Renovables en España, Asociación de Productores de Energías Renovables" (APPA) "PERSPECTIVAS DE LA ENERGÍA EÓLICA MARINA EN ESPAÑA", CCOO	**Offshore wind** This sector is at a research phase at the moment in Spain. The strong effort made in terms of research and development has a reflection on the wide participation of Spanish wind enterprises in European research and development projects, such as: • MARINET(2011-2015): project focused on the study of systems of offshore renewable energy conversion with the participation of more than 25 companies and European Universities. • Project Zéfir Test Station: experimental offshore wind and R & D platform that the Catalonia Institute for Energy Research (IREC) will develop in waters adjacent to the Port of Tarragona. • AZIMUT: 11 companies and 22 research centers work together in order to generate the knowledge needed to develop a large offshore wind turbine. • OCOA: project to optimize the concrete foundations of the wind turbines There are also other significant projects carried out by universities and institutions in Cantabria, Asturias and the Basque Country.
	Renewable offshore energy (marine energy) A level of technology and innovation, in Spain there are a lot of stakeholders involved in sea energies, who are conducting a major research and demonstration effort, as this sector is still in a research phase. There are up to nearly thirty projects (technological and regulatory-methodological) in development in the Spanish coast, with an estimated investment of over 230 m euros. Demonstration Technology Centers are to have a key role in providing installing prototypes and plants for demonstrative projects that will likely turn into commercial in the future. To reach the technological sector's maturity and the development, the Public Administration support will be essential. Some projects developing at the moment are: **Basque Country:** BIMEP (Biscay Marine Energy Platform), research infrastructure, demonstration and operation of systems for capturing wave energy offshore. **Canary Islands:** PLOCAN Project, infrastructure of scientific and technological uniqueness which will house a testbed for harnessing ocean energy (offshore wind, wave, ocean currents, etc..). **Cantabria:** development of an energy node wave power of 2 MW and in Santoña and a test center for marine systems (wave and wind) in the Ubiarco area. **Asturias:** infrastructure led by the University of Oviedo, that aims to create a Singular Technical Scientific Facility located in the Asturian coast for experimentation, demonstration and operation of marine-based energy, environmental research, marine aquaculture and biodiversity and climate change studies.
Spanish Institute for Strategic Studies[101] and Puertos del Estado (State Ports)[102]	**Coastal protection** New innovative project developed by the Spanish Marine Force to use sea lions in rescue and civil protection activities. Development of the "Portus" system by Puertos del Estado: a pioneer ocean-meteorological system easily manageable, that contains personalized information about each port, around the parameter of waves, wind (provided by AEMET), sea level, currents, water temperature and salinity.
Report "Hotspots for tourism in 2013: innovative solutions for ambitious challenges" by PwC *(« Temas candentes del turismo para 2013: Soluciones innovadoras para retos ambiciosos")*	**Coastal tourism (accommodation)** If the Spanish tourism industry invests in innovation, internationalization of products, technological development and product segmentation, the country could reach 80 million receive tourists in 2015. Innovation and the development of new varieties of tourism supply is the key to avoid the seasonality of tourism in Spain. According to experts in charge of the study indicated, Spain could get additional revenue of 20% after the high season. For this purpose, it would be vital to enhance alternatives that exist in other seasons and maintain contact with international tourists would allow discovering

[101] http://www.ieee.es/Galerias/fichero/docs_opinion/2012/DIEEEO39-2012_LeonesMarinos_MartinOtero.pdf
[102] http://www.puertos.es/oceanografia_y_meteorologia/redes_de_medida/index.html

Source	Qualitative assessment regarding innovation potential per maritime economic activity/sector
	new needs. No doubt, it will be vital to this end improve further technological development and optimization of digital tools used in communication. Highlighting the importance of a closer relationship between the efforts of the public and private sectors, the report positions the new technologies and social media as a vital point to achieve the paradigm shift that requires Spanish tourism. PwC concludes that this is the most appropriate way to capture the so-called " connected tourist ", which handles a lot of information and decides based on what he/she receives from digital media.

3.3.2. Other indicators

The innovation scores per MAE have been complemented with a number of additional criteria which have been scored in a qualitative manner. These include:

- Potential for competitiveness of EU industry, in comparison to the global industry in the respective segments;
- Future employment creation;
- Relevance for EU-based policy initiatives in that specific economic activity;
- Spill-over effects and synergies with other economic activities;
- Sustainability and environmental aspects.

Table 3.4 Future potential of economic activities

Maritime economic activity	Innovation Indicators					Other indicators				
	Publication/GVA	Patents/GVA	R&D/VA (2007 or 2009)	R&D/turnover	Composite score[e]	Competitiveness	Employment	Policy relevance	Spill-over effects	Sustainability
0. Shipbuilding										
Shipbuilding	n/a	n/a	4.0%	n/a	●●●	-	+	0	+	-
Construction of water projects	n/a	n/a	n/a	n/a	●●	+	0	0	+	-
1. Maritime transport										
Deep-sea shipping	n/a	n/a	0.2%[a]	n/a	●	+	0	+	+	+
Short-sea shipping	n/a	n/a	0.2%[a]	n/a	●	+	0	+	+	+
Passenger ferry services	n/a	n/a	0.2%[a]	n/a	●	-	0	0	0	+
Inland waterway transport	n/a	n/a	n/a	n/a	●	n/a	n/a	n/a	n/a	n/a
2. Food, nutrition and health										
Fisheries for human consumption	n/a	n/a	0.3%[b]	n/a	●	+	0	-	+	+
Fisheries for animal feeding	n/a	n/a	0.3%[b]	n/a	●	+	0	-	+	+
Marine aquaculture	1.7	0.4	n/a	n/a	●	+	0	+	+	0
Blue Biotechnology	188	33	n/a	n/a	●●●●	+	+	+	+	0
Agriculture on saline soils	n/a	n/a	0.3%[b]	n/a	●	?	?	?	?	?
3. Energy and seabed materials										
Offshore oil and gas	7.8	0.8	1.0%[c]	n/a	●●	+	0	+	+	-
Offshore wind	62	21	n/a	n/a	●●●	-	-	+	+	+
Ocean renewable energy	101	82	n/a	n/a	●●●●	+	0	+	+	+
Carbon capture and storage	n/a	n/a	n/a	n/a	●●	0	0	+	0	+
Aggregates mining (sand, gravel, etc.)	n/a	n/a	n/a	n/a	●	0	0	+	0	0

Maritime economic activity	Innovation Indicators					Other indicators				
	Publication/GVA	Patents/GVA	R&D/VA (2007 or 2009)	R&D/turnover	Composite score[e]	Competitiveness	Employment	Policy relevance	Spill-over effects	Sustainability
Marine minerals mining	159	32	n/a	n/a	●●●●	0	0	+	0	0
Desalination	19	106	n/a	n/a	●●●●	+	0	+	+	0
4. Leisure and tourism										
Coastal tourism (accommodation)	n/a	n/a	0%[d]	n/a	●	+	+	+	+	0
Yachting and marinas	n/a	n/a	n/a	n/a	●●	+	+	+	+	0
Cruise tourism	n/a	n/a	n/a	n/a	●●	+	+	0	+	+
5. Coastal protection										
Coastal protection	0.9	0.3	n/a	n/a	●●	?	?	+	?	+
6. Maritime monitoring & surveillance										
Maritime surveillance	11	31	n/a	n/a	●●●	+	0	+	0	0
Environmental monitoring	10.5	0.9	n/a	n/a	●●●	0	0	+	+	+

a) Transportation & storage
b) Agriculture/fisheries/forestry
c) Mining & quarrying
d) Accommodation & food services
e) For those maritime economic activities for which no innovation indicators are available this is based on expert judgement

Based on the above indicator scores 7 promising activities have been identified. This selection is primarily based on the composite innovation score, followed by the rank on the other indicators.[103]

Table 3.5 **The 7 promising maritime economic activities in Spain**

Rank	Maritime economic activities
1.	Ocean renewable energy
2.	Blue Biotechnology
3.	Desalination
4.	Marine mineral mining
5.	Offshore wind
6.	Environmental monitoring
7.	Maritime surveillance

[103] The overall rank for the other indicators has been established by adding the + and deducting the -.

4. Identification and analysis of maritime clusters

This section identifies the key Blue Growth clusters in Spain and describes their economic activities. Clusters are one of the most notable concepts within economic geography. However they are not always easily to grasp or to measure as they are not clearly delineated industries or sectors. Clusters can be defined at the level of:

- An end product industry or industries;
- Downstream or channel industries;
- Specialised suppliers;
- Service providers;
- Related industries: those with important shared activities, shared skills, shared technologies, common channels, or common customers;
- Supporting institutions: financial, training and standard setting organisations, research institutions, and trade associations.

In this study, clusters are defined as "a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (external economies)[104]."

4.1. Maritime clusters in Spain

Building on the clusters already identified in the Blue growth study[105] and complemented with cluster identified in the EU Cluster Observatory[106], the following clusters have been identified for Spain. Clusters in Spain are located in multiple sea basins: the Atlantic and the Mediterranean.

Table 4.1 **Maritime clusters in Spain**[107]

Longlist of maritime clusters EU Cluster Observatory	Suggested clusters for in-depth analysis		
	Cluster	**Location of the cluster**	**Maritime economic activities in the cluster**
Galicia	Galicia	Atlantic Arc	Coastal tourism, Maritime transport (deep and short-sea shipping), Fisheries, Aquaculture, Offshore renewable energy, Shipbuilding
Andalucia	Cluster Marítimo de Málaga	Mediterranean Sea basin	Shipbuilding, Short sea shipping, Deep sea shipping, Yachting and marinas, Catching fish for human consumption
País Vasco	Basque Country	Atlantic Arc	Shipbuilding, Marine energy, Coastline tourism, Maritime transport (port of Bilbao).
Cataluña	Forum Marítim Català Nautical Cluster of Barcelona	Mediterranean sea basin	Shipbuilding, Catching fish for human consumption, Deep sea shipping, Coastal tourism, Yachting

[104] Prof. Michael E. Porter, 20120213, MOC2012 (HBS course) Session 5 - final
[105] In the previous Blue Growth study, these were: Bretagne, Brest, Marseilles, ES: Galician Coast, Barcelona;
[106] The EU Cluster Observatory denotes maritime clusters and tourism clusters.
[107] This longlist is based on the EU cluster observatory. Besides, additional selection criteria were applied, primarily based on the mix of maritime economic activities. See also separate methodology note provided for the cluster analysis.

Longlist of maritime clusters EU Cluster Observatory	Suggested clusters for in-depth analysis		
	Cluster	**Location of the cluster**	**Maritime economic activities in the cluster**
			and marinas and Cruise tourism
Canarias	Clúster Marítimo de Canarias	Atlantic Arc	Ship repairs; port services; fishing and aquaculture; coastal tourism and cruise tourism; ocean renewable energy; blue biotechnology; auxiliary industries; and maritime monitoring and surveillance.
Valencia		Mediterranean sea basin	
Cantabria		Atlantic Arc	
Asturias		Atlantic Arc	
Murcia	Cluster Naval y del Mar	Mediterranean	Shipbuilding, ship repair and maintenance, port and related services, industry and energy, hydro resources, environment.
Baleares	Clúster Marítimo de las Illes Balears	Mediterranean	Offshore oil and gas, Short sea shipping, Deep Sea Shipping, Coastal Tourism, Yachting and marinas and Cruise tourism
Baleares	Balearic Cluster on Maritime Innovation (IDIMAR)		Innovation, Coastal Tourism, Yachting and marinas and Cruise tourism

Shortlist of maritime clusters in Spain for in-depth analysis[108]

The cluster analysis builds further on the regional allocation of economic activities as described under section 2.2. It also aims at assessing the maturity of the cluster (mature, growing or early development). Two specific clusters have been selected for a more in-depth assessment±:

- Basque Country: The Atlantic region has relevant role, comparing to the Mediterranean arc, in terms of fishing and aquaculture and offshore renewable energies. The maritime economy represents 2.5% of the Basque Country's GDP, with a total value of € 2 100mand 17 000 employers. The region outstands for its shipbuilding industry, and auxiliary development activities thanks to the improvements and efforts realised in the field of I+D. The Port of Bilbao is ranked the fourth Port in term of traffic activity at the national scale at represents around 1% of the region's GDP. Moreover, in the region there is an established Cluster (Foro Marítimo Vasco - Basque Maritime Forum), a non-profit-making organisation aim at representing, defending, consolidating, promoting and improving the competitiveness of the companies in the Basque maritime sector;
- Galicia: Galicia, is characterised by its biological *richness*, intensive fishing and aquiculture activity, maritime transport traffic (Port of Vigo) and shipbuilding industry. The Galician Fleet capacity is the largest of Spain, and fishery traditionally represents an important source of income and employment for the region.

4.2. Cluster analysis

The shortlisted and selected clusters are analysed according to the following aspects (Table 4.4):

1. Identification of existing clusters/updating the list in the 2012 Blue Growth study;

[108] This selection is based on the longlist compiled through the EU cluster observatory. It has been approved by DG MARE and follows the logic of the request for services.

2. Identifying of maritime economic activities in the cluster and indicate the mixture and composition of the cluster activities in terms of their development stage (mature, growing, early development);
3. Assessment of strengths and weaknesses (feeding in to the overall SWOT analysis on the sea-basin level which will be part of the final report).

In addition to that, the identified clusters should be analysed according to the following indicators (Table 4.2):

4. Number of students in higher education;
5. Number of students in higher education following courses specially designed for employment in the blue economy;
6. Unemployment rate in the cluster;
7. On-going research in a given cluster, i.e. number of on-going research programmes and projects in the cluster, regionalised patent & publications data (where available at cluster level), R&D test centres located in the cluster etc.

Table 4.2 **Description of maritime clusters**

Cluster	Maritime economic activities concerned	Unemployment rate at cluster level[109] (NUTS III or II level)	Ongoing research: main research institutes / companies associated to the clusters
Galicia	• Coastal tourism • Deep and short-sea shipping • Fisheries, • Aquaculture • Offshore renewable energy	Unemployment rate in the region is 22.4%, this is 270 515 people. Please note that this is the figure for all sectors. Breakdown figures do not follow a marine approach.	Instituto tecnoloxico para o control do medio mariño de Galicia[110] Asociación Cluster del Naval Gallego (ACLUNAGA) Instituto Español de Oceanográfia (Centre of Viga and Centre of La Coruña). Instituto de Investigaciones marinas Centro tecnológico del mar (CETMAR) CIS - GALICIA - Centro de Innovación y Servicios de Galicia Plataforma Tecnolóxica do Sector Naval de Galicia Plataforma Tecnolóxica Galega de Loxística[111] Universidad de A Coruña Universidad de Santiago de Compostela Universidad de Vigo
Basque country	• Shipbuilding • Marine energy • Coastal tourism • Maritime transport	Unemployment rate in the region is 15.46%, this is 100 772 people. Please note that this is the figure for all sectors. Breakdown figures do not follow a marine approach.	Foro Marítimo Vasco Agrupación de industrias marítimas de Euskadi Asociación profesional de maquinistas navales Fundación y Centro Tecnológico de los Astilleros Medianos y Pequeños - Soermar Escuela Técnica Superior de Náutica y Máquinas Navales - Universidad del País Vasco Escuela Universitaria de Ingeniería de Bilbao – Universidad del País Vasco Consejo económico y social vasco AZTI-Tecnalia IK4 Museo marítimo ría de Bilbao

Other clusters, research institutions, foundations with relevance in the field of maritime activities have been identified at National level, thus having important direct and indirect impact to the regional clusters of Galicia and Basque Country [112]:

[109] Where available data exists, this should be provided at NUTS 3 level. However, if not available, a NUTS 2 data are gathered. The breakdown on cluster level will be provided and the rationale provided.
[110] For more information: www.intecmar.org
[111] For more information: www.loxisga.org
[112] For more information on maritime organisations and associations, please refer to the following websites : www.kimeraa.eu/mapa/index.php, www.ptmaritima.com/desar/miembros.asp?apt=63

- Cluster Marítimo Español : www.clustermaritimo.es ;
- Pescaplus- Oficina para la promoción y dinamización de proyectos de innovación tecnológica: www.pescaplus.es ;
- Plataforma tecnológica española de la pesca y la acuicultura (PTEPA): www.ptepa.es ;
- Plataforma Tecnológica para la Protección de la Costa y del Medio Marino (PROTECMA) : www.ptprotecma.es ;
- Confederación española de pesca (CEPESCA) : www.cepesca.es ;
- Fundación Innovamar: www.innovamar.es ;
- Fundación Aulamar : www.aulamar.org ;
- Fundación Ecomar : www.fundacionecomar.org ;
- Federación española de empresarios del mar (Identidades, Valores y Estrategias Alternativas para los Empresarios Marítimos y Pesqueros- IVEAEMPA): www.iveaempa.org ;
- Instituto Español de Oceanografía (IEO) : www.ieo.es ;
- Instituto Marítimo Español (IME) : www.ime.es ;
- Real Academia de la Mar : www.hispamar.es ;
- AEPTMCD - Asociación Española de Promoción del Transporte Marítimo de Corta Distancia : www.shortsea.es ;
- AITEMIN - Asociación Instituto de Investigación y Desarrollo Industrial de Recursos Naturales : www.aitemin.es ;
- ANAVE - Asociación de Navieros Españoles: www.anave.es ;
- ANEN - Asociación Nacional de Empresas Náuticas: www.anen.es ;
- Asociación de Ingenieros Navales del Estado (AINAVAL) : www.ainaval.es.

Table 4.3 Education figures of the maritime clusters

Cluster	Number of students in higher education	Number of students in higher education following courses for employment in blue economy
Galicia	**n/a**	n/a
Basque Country	**n/a**	n/a

Table 4.4 List and strengths and weaknesses of clusters

Cluster	Maritime economic activities convered	Status	Strengths	Weaknesses
Galicia				
Galicia	Coastal tourism	Incipient phase (Early development)	Spain • Spanish is an important touristic destination, mainly due to its great offer of sun & beach touristic facilities. Galicia • Tourism oriented towards a nature & marine holistic approach (gastronomy, thalassotherapy[113], culture, nature, sports and marine traditional activities). At this regard the region has developed several Thematic Plans[114].	Spain • Coastal tourism mainly concentrated in the Mediterranean region, and meeting high foreign demand. Galicia • Weather conditions of northern regions that do not fulfil the sun&beach requirements.
Galicia	Maritime Transport	Growing	Spain • Strategic emplacement at the verge of the African and European continent, Mediterranean sea and Atlantic ocean. Galicia • Important investments in ports	• Galician ports are not representative for the country both in terms of volume of cargo and income generation: Main ports in Galicia are Ferrol (Ranked 12th), A Coruña, Vigo, Pontevedra y Vilagarcía[115].

[113] Toja Isle.
[114] For more information on Thematic tourism plan in the Galicia Region: http://turismo.xunta.es/index.php?id=25
[115] Data has been extracted from the Ports of Spain Annual report 2011.

Cluster	Maritime economic activities convered	Status	Strengths	Weaknesses
			infrastructure: Galician ports will received a total of 141M€ in 2012/2013 and 106M€ in 2014 • Port development works take into account a holistic territorial planning approach (biodiversity, urban planning..) • The region is an important area for the Atlantic Area MOS. E.g. VIGO port, represents a strategic point in the ports infrastructure and is the first port of Spain in terms of fishing products	
Galicia	Fisheries	Mature. Development towards a more technological industry in the field of fish processing	<u>Galicia</u> • The region is one of the main fishing regions of the country, characterised by its traditional fishing activities, craftwork processes and products (shellfish). • Its fleet capacity represents 6% of the total fleet of the UE, and is the largest of Spain. • Galicia represents 45.5 % of the total national employment in the field of extractive fishing. • Galicia accounts for 87% of shellfish state affiliates according to the Ministry of Agriculture, Fishery and Food (2006). • Strong development in the field of processing products: e.g. tuna canning industry leader in Europe. Canning industry cluster in Spain[116]. • Galicia is an important hub for fisheries research with several universities and research institutes, such as IEO (Spanish Institute of Oceanography) with research centres in Galicia	Spain • National fish supply does not meet the national demand. Although alternatives are being found in the Aquamarine sector. <u>Galicia</u> • Increasing ageing of the occupied population and lack of generational replacement in the sector. • Low innovation technologies applied to the field. • Fish stock and ocean biodiversity conditions, damaged by overexploitation and petroleum disasters (ie. Prestige) • PESCANOVA has traditionally been a leader in frozen fish processing, but the company is actually in arrangements with creditors
Galicia	Offshore renewable energy (ocean and wind energy)	Early development	<u>Spain</u> • Renewable energies, particularly wind energy, are a leading innovation sector in Spain, where the country holds high levels of I+D technology and experience. The country has a national strategy towards the development and support of Renewable energies, framed in the Renewable Energies Plan 2011-2020. <u>Galicia</u> • Galicia is the Spanish region with the highest wind energy potential[117] . • Galicia holds a strategic emplacement for the development of wave energy platforms, where intensities of ocean currents can reach 100kw/m. • The region has developed a Wave energy Map, for the Galician region[118]. • The region hosts several projects in the field of wave offshore renewable energy and has several testing tanks, e.g. PSE-MAR project, and Galicia Mar Renovables project, Wave Cat and Sea Energy	• Depth of Atlantic Ocean coastal water renders difficult the creation of offshore wind parks. • Need for floating technology to achieve sufficient maturity in order to become competitive in a large scale.

[116] For more information please refer to the ANFACO-CECOPESCA organisation website: www.anfaco.es
[117] Desarrollo de las energías renovables marinas: condiciones de éxito en las regiones RTA del Arco Atlántico, Red Transnacional Atlántica, 2010.
[118] The project has been developped by METEOGALICIA.

Cluster	Maritime economic activities convered	Status	Strengths	Weaknesses
			• Several r+d institutes and associations in the field of energy and navy in the region, that are developing initiatives and merging their knowledge at the service of offshore wind energy, e.g. ENERXE, ENVITE and ENERMAS.[119]	
Galicia	Aquaculture	Growing	Spain • National fish supply does not meet the national demand. Aquaculture represents a leading sector for the Spanish economy. Galicia • Galicia represents 65% of the total national employment in the field of aquaculture. Galician Mussels production on rafts, the main activity in the region, represents around 69% of the total national aquaculture production. • Opportunity to move towards more sustainable exploitation while responding to market conditions • Galicia is a hub for aquaculture research with several universities and research institutes (IEO, Instituto Español de Oceanografía (Oceanographic Centre of Vigo and Oceanographic Centre of Coruña) • Specialised cluster that offers education and training in the field of aquaculture: Instituto gallego de formación en acuicultura.	• Mussels farming is an aquaculture activity highly dependent on climate and other environmental conditions.
Galicia	Shipbuilding	Mature, need to develop I+D activities	• The region has a long tradition in the sector and hosts 15.3% of the National Shipbuilding Companies. • Navantia, situated in the port of Ferrol, is currently involved in the construction of several high-tech vessels and water turbines, also used for renewable energy. • The Galician branch of Navantia is also specialised in ship repair services • The sector is organised under different clusters and research institutes: Asociación Cluster del sector naval Gallego- ACLUNAGA120, Plataforma Tecnolóxica do Sector Naval de Galicia, Centro tecnológico naval gallego (CETNAGA), research units of the Vigo, Santiago de Compostela and A Coruña Universities.	• High international competitiveness, specially from Asian countries (China and Korea) • Highly dependent on Public and European financial aids. • Navantia, public enterprise with 5.000 employees, highly dependent on State aid and is currently in a restructuring process that may severely affect the region.
Basque Country				
Basque country	Shipbuilding	Mature, development towards a more technological industry	Long experience in the construction of military vessels and r+d development applied to the sector. High investments and improvements in terms of r+d and technology.	• High international competitiveness, specially from Asian countries (China and Korea) • Highly dependent on Public and European financial aids.
Basque country	Marine renewable energy	Early development-Growing	Spain • Renewable energies, particularly wind energy, are a leading innovation sector	• Depth of Atlantic coastal water renders difficult the creation of offshore wind parks.

[119] Desarrollo de las energías renovables marinas : condiciones de éxito en las regiones RTA del Arco Atláncito, Red Transnacional Atlántica, 2010.
[120] For more information, refer to: www.aclunaga.es

Cluster	Maritime economic activities convered	Status	Strengths	Weaknesses
			in Spain, where the country holds high levels of r+d technology and experience. • The country has a national strategy towards the development and support of Renewable energies, framed in the Plan de energía renovables 2011-2020. <u>Basque country</u> • Basque country is leader in the development of renewable energy, strongly supported by the Basque government through the *Ente Vasco de la energía* and has elaborated an *Estrategia energetica de Euskadi 2020.* • The government is actively involved in marine renewable energy initiatives and has created the CIC ENERGIGUNE research centre responsible for the BIMEP and Mutriku initiatives. • The region has developed leading projects in the field of wave offshore renewable energy, e.g. Mutriku project, BIMEP project, Oceantec project and the Ocean Power Technology projects. • The region has developed a Wave Energy Map that allows the analysis and statistical measure of wind and currents force for a more accurate installation of projects but also for environmental purposes. • Several r+d institutes and companies from the field of energy are developing a cluster that aims to promote marine energy (e.g. GTEO – Working group on wave energy to find out business opportunities in the Basque Country and abroad; BEOG - Basque Eolic Offshore: Group for industrial diversification an its introduction in the sector of marine power, particularly offshore wind power, under the BEOG brand (Basque eolic offshore Group); NAUTILUS-Consortium made up by 4 industrial companies from the Basque Country and the technology centre TECNALIA with the aim of developing a floating platform for offshore wind turbines to be installed in deep waters; • Another initiative is the OCEANTEC project which is a Tecnalia Technology Corporation spin-off, participated by Grupo Iberdrola that focuses on the development of their proprietary technology for the creation of an offshore floating converter using wave power. The group is currently working on the design of a real- scale prototype to be installed for testing in the BIMEP in 2014. The goal is to make park of 60 MW that meets the objective set by the Basque Energy Strategy • Strong industry, atmosphere conducive to achieve marine energy development, which encloses energy operators, turbines manufacturers, major engineering companies,	• Need for floating technology to achieve sufficient maturity in order to become competitive in a large scale.

Cluster	Maritime economic activities convered	Status	Strengths	Weaknesses
			electronics, naval construction and auxiliary engineering that could easily diversify its activities towards marine energy . • The region is also very active organising events and conferences in this area, such as the BMEW (Bilbao Marine Energy Week). EVE, TECNALIA and BEC (Bilbao Exhibition Centre) with the sponsorship of IBERDROLA and the collaboration of the Energy Cluster and the Foro Maritimo Vasco organized a very successful event in spring 2013 for marine energy associated to SINAVAL, a traditional exhibition of the maritime sector. BMEW is expected to continue as a biennial event. EVE and TECNALIA have organized several conferences about marine energy since 2005.	
Basque country	Coastal tourism	Growing	<u>Spain</u> • Spanish is an important touristic destination, mainly due to its great offer of sun & beach touristic facilities. <u>Basque country</u> • Tourism strategy in the region is based in four strategic documents aiming to promote mainly the gastronomy, nature and culture of the region: *Plan de Competitividad del Turismo Vasco 2010-2013, Plan de Marketing del Turismo Vasco 2010-2013*, the *Plan de Turismo Cultural de Euskadi* and *Plan Director de Turismo de la Costa Vasca.* • Increasing relevance of the region as a hosting place for cultural events (San Sebastian festival), sports competitions (surf, windsurf, etc.) • Together with the growth in cruisers calling at Bilbao in recent years, the Port of Bilbao is aiming at becoming an open door for tourists coming to Spain by sea.	<u>Basque country</u> • The weather conditions of northern regions do not fulfil the sun& beach requirements.
Basque country	Maritime transport	Growing	• The Port of Bilbao is the 4th port of Spain in terms of traffic (33,415 million tonnes in 2013 so far) and growing. • Bilbao is the only Spanish Atlantic port included in the core network (core network) of the TEN –T • In September 2007, the first motorway of the sea on the Bay of Biscay began between Spain and Belgium. Transfennica offers five weekly sailings from Bilbao to the Belgian port Zeebrugge with three modern vessels, equipped with the means to transport driver-free lorries, platforms, containers and high & heavies. In addition, cold goods are also accepted • New lines have been opened linking Bilbao with major ports in USA, China, and India among others, reaffirming Bilbao's position as the EU entrance gate in Spain, in connection with UK, Netherlands and Belgium markets that	• Decrease in oil and gas traffic from the Spanish Oil refinery company PETRONOR and the scrap imports of ARCELOR MITTAL SESTAO, one of the largest steel manufacturer company in the country (both located in Biscay).

Cluster	Maritime economic activities convered	Status	Strengths	Weaknesses
			has met an increase of 8% in 2011[121]. • Investments during 2012/2013 in the port were 40M€ and forecast for 2014 is 19M€. • The port of Bilbao presents a strong hinterland and intermodal transport connectivity (rail and roads) thus in line with the TEN-T European maritime transport strategy. • The port has elaborated the first Sustainability Guide, stating its environmental compromise and its commitment under an Integrated Management System. • In 2011 the port has been accredited with the quality certification- ISO 14001. • A mobile application (APP platform) has been created to inform about the services, routes and other relevant information of the port.	

List of **specific regional or national cluster strategy** in place

Table 4.5 **Regional or national cluster strategy**

Regional or national cluster strategy	Brief description of main objectives and features
Cluster Marítimo Español (Spanish Maritime Cluster)	Mission and Objectives The cluster is oriented towards the promotion of a Bluegrowth strategy in Spain, completely aligned with the European Maritime Policy and for the increased relevance of the maritime sector in the Spanish economy. The principal objectives are: -To encourage the development and competitiveness of the Spanish maritime industry by achieving business excellence; encourage innovation and high tech product development; - To improve efficiency of Spanish industrial and commercial management companies, and internationalisation of their products in order to increase competition of Spanish companies in the global market; -To contribute to the wealth generation and economic prosperity of Spain by promoting professional development of employees of the different maritime sectors and generating high quality jobs of the different maritime sectors; -To maintain and strengthen the leadership, growth, competitiveness and sustainability of European maritime activities. Areas The strategic plan identifies several thematic action lines, in relation with Blue growth to be principally coordinated with the naval industry and other Spanish maritime organisations. These are: - Maritime transport - Ports - Shipbuilding and ship repair - Fishery - Aquaculture - Leisure boats - Marine research - Education and training
Foro Marítimo Vasco (Basque Maritime Forum)	Mission - Objectives: The cluster encloses outstanding regional firms, associations and institutions of the different maritime sectors and the Basque country Government, and has the mission to defend, consolidate, promote and improve the competitiveness of the

[121] Balance 2011, Puerto de Bilbao.

Regional or national cluster strategy	Brief description of main objectives and features
	Basque maritime enterprises in the global market. The cluster has elaborated a Strategic Action Plan 2009-2012[122] that identifies the following objectives: - To promote and support regional firms to achieve excellence in management and competitiveness while taking in hand socio-economic and environment conditions - To support regional firms to attain leadership position in international markets, through innovation strategies, capacity building and training activities - Advocacy actions for the full support of the sector in the different decision-making forums and levels. - Information delivery on the sector's situation, evolution and challenges in the region and the global market, and be a communication and information vehicle to all companies of the sector. Areas: The above mentioned plan has constructed the overall strategy of the cluster through the identification of the following strategic areas: - Internationalisation - Technology - Business Management Excellence, Finance-auditing - Education and capacity building, Communication - Information, Interest representation The cluster offers a series of services and activities to its partners related to these strategic objectives such as participation in conferences and representation in decision-making forums, thematic workshops, revitalisation of technological projects, recycling initiatives, sectoral agreements and alliances, advice for quality management systems implementation, etc. At this regard, 2 ambitious projects have been developed by the Forum: - A Competitive Intelligence System, with the purpose to easily compile sector-related information and disseminate it to the companies and organisations within the cluster, in order to be used as a technological surveillance tool. - A diagnostic-study of the sector with the aim to assess the needs, challenges and modernisation requirements of maritime activities in the region and serve as a road-map for the sector's strategy. (e.g. education and training in the area of shipbuilding in order to make the sector more technologically intensive).

[122] Plan de acción Foro Marítimo Vasco 2009-2012.

5. Analysis of measures, policies and strategies to stimulate growth and good practices in the sea-basin

Law 41/2010 of 29th for December on the Protection of the Marine Environment is the transposition into Spanish regulatory system of Directive 2008/56/EC of June 17, 2008, that establishes a framework for a European Marine policy to achieve or maintain good environmental status of the marine environment by the year 2020. Subsequently, the Commission has adopted *Commission Decision 2010/477/EU on Criteria and methodological standards on good environmental status of marine waters*. This decision contains the criteria and associated indicators that allow assessing good environmental status in relation to the 11 descriptors listed in Annex I of the Directive.

To facilitate the planning work for the elaboration of the Spanish marine strategy, the Law 41/2010 realises a division of the country in five marine boundaries:

- North Atlantic, “Estrategia marina para la demarcación noratlántica”;
- South Atlantic, “Estrategia marina para la demarcación sudatlántica”;
- Alboran Strait, “Estrategia marina para la demarcación del Estrecho y Alborán”;
- East-Balearic, “Estrategia marina para la demarcación levantino-balear”;
- Canary Islands, “Estrategia marina para la demarcación canaria“.

For each one of the 5 marine boundaries government shall develop a marine strategy[123]. Currently, the first three phases (initial assessment, good environmental status and environmental objectives) have been completed and the Ministry of Agriculture, Food and Environment is working on the implementation of the next phase of the marine strategies through the development of monitoring programs. These programs should make the most of existing programs, and be coordinated and consistent among countries that share marine subregions. They will also be subject to public consultation, and should be ready by July 2014[124].

Apart from that, Spain doest not have a specific document such as a Blue Book that integrates the whole of marine and maritime activities in accordance with Blue Growth Policy vision[125]. Nonetheless, the following Strategic Plans and Programmes have been identified, in relation:

- National Strategic Plan for the European Fisheries Fund 2007-2013, and the Operational Programme for the Spanish fisheries sector;
- National Action Plans on Marine Aquaculture;
- River Basin Management plans;
- Guidelines for Integrated Coastal Area Management ;
- Strategic Infrastructure and Tranports Plan 2005-2020;
- National Action Plan for Adaptation to Climate Change;
- National Action Plan for renewable energy 2011-2020;
- Spanish Strategy for the conservation and sustainable use of the biological biodiversity.

[123] For more information please refer to: http://www.magrama.gob.es/es/costas/temas/estrategias-marinas/default.aspx
[124] MAGRAMA website : www.magrama.es
[125] Executive summary : Blue Growth in the Mediterranean region: Spain perspective, May 2013.

Table 5.1 Assessment of maritime and generic policies

Policy	Objectives	Priorities	Consequences for maritime activities	Impacts on sustainable growth	Investment and funding
National Strategic Plan for the European Fisheries Fund 2007-2013 + OP for the Spanish Fisheries sector *(Plan Estratégico Nacional del Fondo Europeo de La Pesca 2007-2013 + Programa Operativo para el sector pesquero español).*	The strategy pursues the adaptation of the fishing fleet, in order to ensure the future exploitation of living aquatic resources that provides sustainable environmental and social conditions, while ensuring a long-term economic sustainability.	• Management and adaptation of the fishing fleet; • Sustainable development of aquaculture activities; • Sustainable development, and processing and marketing of fishery products; • Sustainability of fishing areas; • Improving competitiveness in fisheries; • Preservation of human resources in the fisheries sector; • Protection and improvement of the aquatic environment related to the fisheries sector; • Inspection and control of fishing activities, through data collection and information systems and procedures on the common fisheries policy and sanctions regime; • Market supply and maintenance of fishing by Spanish vessels outside Community waters.	• Fishing effort adjustment actions: cessations (shipbreaking) and conversion to other uses (recreational); • Promote investment to improve safety and working conditions of workers and energy efficiency; • Support to traditional coastal fishing; • Promote of R & D by improving energy efficiency, improving seaworthiness of vessels and use of more selective techniques.	• Reduction of the fishing effort in order to restore fisheries; • Reinforcement of employment in the fishery sector; • Reduction of operating costs to increase the benefit of fishermen and fisheries sustainability improvement.	The total amount forecasted is €946M, as its breackdowb is described in the Operational Programme. Financial sources are: FEDER, FSE, Innovation plans, Spanish Central Administration (Fisheries Directorate General), and Autonomous Regions, etc.
National Action Plans on Marine Aquaculture *(Planes Nacionales de Cultivos Marinos).*	The purpose of these plans is to promote and develop marine aquaculture in an harmonised way in the whole country. They are oriented towards the achievement of specific and concrete objectives to eliminate ambiguities and generalities and to be of interest to a significant portion of the country. The plans are elaborated by the Governement and the Autonomous regions, but co-ordinately executed by the Autonomous Regions under a specific plan for each marine species. The evaluation of	Efforts focus on research, development and innovation, as well as any complementarity activity related to marine aquaculture whose achievement is considered important for the harmonious development of the sector.	• Develop a solid aquaculture sector in the Spanish marine sector; • Increase maritime revenue and new income sources through the development of the sector; • Create employment opportunities; • Promote sustainable fishing; • Protect marine enviroment and biodiversity.		Each plan elaborates a breackdown on the cost and activities to be realised. No data on the total amount invested on marine aquaculture is provided by the Ministry of Agriculture, Food and Environment.

Policy	Objectives	Priorities	Consequences for maritime activities	Impacts on sustainable growth	Investment and funding
	those plans is commissioned to the Junta Nacional Asesora de Cultivos Marinos. From 2011-2012 a total of 38 plans have been elaborated and executed.				
River Basin Management Plans *(Planes Hidrológicos de Cuenca*[126]*).*	The plans are elaborated to ensure the good condition and adequate protection of public water and wastewater, meeting water demands in balance with regional and sectoral development. The different actions aim to safeguard the availability of the resource, while protecting its quality, saving water dependent related jobs and streamlining their uses in harmony with the environment and other natural resources protection, through holitis and long-term initiatives. Water planning should contribute to mitígate the effects of floods and droughts, guided by the sustainability criteria in the use of water.	• Drainage and water treatment initiatives; • Ensure water provision; • Modernisation of Irrigation methodologies and practices; • Flood management; • Restoration of water bodies in humid areas; • Energy and water regulation; • Planning and administrative control of water.	• Develop measures concerning Water Stations Treatment, deposits and pumping tools through the improvement of supply networks; works in dams and weirs; improved catchments and pipeline; • Realise drainage and water treatment works through improvements in wastewater treatment plants, manifolds and sanitation networks; • Support the modernization of irrigation activities and practices through the investment in lower water consumption systems, improvements in canals and ditches and implementation of regulatory measures and concessions; • Develop flood management actions through the design of an Early Warning System including prevention plans; improvement works in dams, channels and defense flecks restoration. • Support actions for the Restoration of rivers, waterfront redevelopment, restoration Wetlands, etc • Develop administrative Measures to complement Water management and prevention mechanisms. • Develop Networks for water control (AHIS-SAICA) and cost recovery rate update, rules and regulations of uses, development of good practice codes, awareness campaigns and environmental education.		Each plan elaborates a breakdown on costs and activities to be realised. Financial support is safeguarded through recuperation costs instruments, such as water surcharge and water supply tariffs.
Guidelines for Integrated Coastal Area Management *(Plan estratégico Directrices Gestión Integrada de Costas).*	These guidlines serve to identify and promote measures to halt and reverse the erosion of environmental resources, deterioration of socio-economic and cultural	• Preservation and restoration of the values and functions of the natural and scenic coastal strip ; • Natural recovery in degraded coastal areas or excessively urbanized zones . • Protection of the beach as a natural area with high environmental values ;	• Attend the incessant growth of the coast demand exceeding in many cases the capacity load of the beaches and fall of the environmental quality of these urban coastal areas . The recovery of the coastal edge quality of these cities and urban areas is closely linked to the pressure relief on edificatoria on seashore ; • Transform urban waterfronts to protect and preserve the coast, and to "recover naturally" the degraded coastal and urbanized areas ensuring the		The Coasts Directorate General has a specific financial item for urban coast areas' protection and regeneration. The amount is included in the General State Budget.

[126] A total of 18 plans approved. http://www.magrama.gob.es/es/agua/temas/planificacion-hidrologica/planificacion-hidrologica/planes-cuenca/default.aspx.

Policy	Objectives	Priorities	Consequences for maritime activities	Impacts on sustainable growth	Investment and funding
	resources in coastal areas, and to improve their overall situation. They intend to provide guidance on what should be the content, approach and objectives of coastal works projects, among which are those that pursue the integrity protection of the coast as well as its free public access and use.	• Recovery of natural spaces of the waterfront ; • Protection and defense of the integrity of public land and maritime areas and access for general use ; • Ensuring the public use of the seashore and the rest of the public domain seascapes ; • Improvement of open access, transit and public use of the coast in those stretches where there is some privatization of the coastline.	environmental quality and the general interest of the coast; • Support routes works and nature trails on non-urban coastal areas that allow exploring the coastline walk and enjoy the scenery and natural value of Spanish Coast ; • Develop actions for free access, transit and public use of the shoreline by integrating trails and itineraries in harmony with the environment, reducing their impact as much as possible, both physically and visually.		
Strategic Infrastructure and tranport plan 2005-2020. *(Plan estrategico de Infraestructuras y Transporte 2005-2020[127]).*	The plan ensures the effective integration of Spanish transport system to European transport policies, by the increase in the relative weight of the different transports involved in intermodal transport (air, road, rail and maritime) both in long distance movements of passengers and goods.	Particular attention will be given to maritime (and air links connections), in order to better integrate these networks in non-mainland areas of Spain.	Increase by 2020 national operators presence in the maritime transport market, to attain an economic share proportionate to the country's weight in the EU/Internationl level; and support intermodal operator (with participation in rail, sea and road) activities to the average levels of the European Union.		A total of investment effort of € 250,000 M; through direct investment (State and Central Government Administration), Indirect investment (Autonomous Community, Municipality, Public Corporation or Holding Company), EU funds, Public Private Partnership agreements and deferred mechanisms (i.e. Automobile charge, special levies, etc). The amount for Sea transport and ports is 23,460million and, in the frame of intermodal transport , a total of 1,220millionis foreseen for "Land access to ports projects".
National Action Plan for Adaptation to Climate Change. *(Plan Nacional de Adaptación al*	The plan seeks the integration along all sectors and/or systems of climate change adaptation measures in order to implement and develop	• Adaptation of R&D and innovation scheme to the needs identified in the field of climate change; • Development of a permanent process of information activities and communication of projects evolution ;	• Biodiversity: protect inland aquatic ecosystems, realise evaluation studies of protected natural areas, create a biological indicator system, etc. • Fisheries and marine ecosystems: climate change supposes a reduction of Spanish waters productivity given its characteristics of warm temperate seas, that may infer a change in the distribution of many species. Also, unsubsidized mariculture with food may be affected by the reduced marine productivity.		n/a

[127] http://www.fomento.gob.es/MFOM/LANG_CASTELLANO/_ESPECIALES/PEIT/

Policy	Objectives	Priorities	Consequences for maritime activities	Impacts on sustainable growth	Investment and funding
Cambio climático[128]*).*	state-level commitments that the country has gained in the international context of the United Nations Framework Convention on Climate Change (UNFCCC) and the European Union. The plan is conceived as a continuous and cumulative process of knowledge generation and capacity building, as well as a tool for decision makers related to climate change adaptation policies.	• Promotion of participation of relevant actors through their involvement in the different sectors / systems ; • Elaboration of specific reports taking in hand the results of the evaluations and projects ; • Preparation of periodic reports for the monitoring and evaluation of the joint projects and the National Adaptation Plan.	Increases in the presence of toxic phytoplankton species or cultivated species parasites, are favoured by the temperature increase of coastal waters. The plans supports the evaluation of marine protected area networks to mitigate these impacts. • Coastal areas: a rise in the level of the sea may have an impact on deltas and coastal wetland areas for agricultural use or built in the vicinity of estuaries or coastal floodplains. At this regard the plan includes the evaluation of potential actions to enhance stabilization of beaches and dunes, construction works to protect transport capacity of the incident wave and artificial sediments. • Transportation: a rise in sea level, changes in the regime rainfall, winds, waves, etc., could have numerous impacts on ports and maritime transport; • Tourism: Areas most vulnerable to climate change are located in the coastal area (with a high degree of artificiality), which supposes a threat to the Spanish main tourism product, tourism of sun and beach. On the other hand, the sea level rise threats the current location of certain tourist settlements and their infrastructure.		
National Action Plan for renewable energy 2011-2020. *(Plan de acción nacional de energías renovables 2011-2020*[129]*).*	The plan promotes the use of energy from renewable sources, with the objective that renewable sources account for at least 20% of final energy consumption in 2020, with a contribution of 10 % of renewable energy in the transpors sector t in that year.	• Liberalization and the promotion of transparency in energy market as well as the development of international interconnections in the electricity and gas sector; • Development of energy infrastructure to improve security and diversification of energy supply sources through the modernization of networks, the development of LNG regasification plants, underground natural gas storages and strategic reserves of petroleum products; • Promotion of the use and conssumption of renewable energy and energy efficiency and savings, by increasing the investing effort in technology, advances in the management of the system, the use of storage techniques such as pumping, or the development of renewable energy facilities with a storage capacity.	• Develop a specific regulatory framework for the development of the Sea Energy projects ; • Develop scientific research and innovation lines, to promote technological development of renewable energy prototypes at sea; • Develop specific marine technologies, designed for the deployment of deepwater projects.		The financial support is assured throught the determination of specific compensation values for each renewable-energy aiming to contribute to the investment efforts realised in this field. These compensation values for the remuneration of the renewable energy production are established by royal decree, RD 485/2009.
Spanish Strategy for the conservation and	Increase the knowledge and conservation of biodiversity as a whole,	• Promotion of active cooperation between all parties involved, both from the different public and private institutions and the	• Identify the areas likely to be part of the list of Specially Protected Areas for its importance in the Mediterranean (ZEPIM) according to the Fourth Protocol of the Barcelona Convention, as well as marine areas appropriate to the process		n/a

[128] http://www.magrama.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/pna_v3_tcm7-12445_tcm7-197092.pdf
[129] http://www.minetur.gob.es/energia/desarrollo/EnergiaRenovable/Paginas/paner.aspx

Policy	Objectives	Priorities	Consequences for maritime activities	Impacts on sustainable growth	Investment and funding
sustainable use of the biological biodiversity, *(Estrategia española de conservación y uso sostenible de la biodiversidad biológica*[130]*).*	protecting the variety of life forms, species and communities, and the maintenance of ecological processes.	various social and economic groups, to achieve a company-wide commitment to the ration and sustaible conservation of biological diversity ; • Incorporation of the principles of restoration, conservation and sustainable use of biodiversity in planning processes and sectoral and intersectoral policies ; • Establishment of planning management mechanisms for the conservation of natural resources in the medium and long term ; • Promotion of research, knowledge generation activities and training on biological diversity ; • Incrementation of education, outreach and information efforts to raise awareness on citizenship and achieve social involvement in the conservation and sustainable use of biological diversity ; • Articulation of policy instruments and financial resources, through the adaptation of existing instruments or through the possible establishment of new ones ; • Involvement of bilateral and multilateral programs and active participation in all initiatives arising between countries towards the better conservation of natural heritage, in line with the gaining momentum of international cooperation in this area.	of implementation of Annex V of the Convention on the Prevention of Marine Pollution (OSPAR), as and create a technical-administrative database for these areas ; • Develop restoration plans for natural habitats, terrestrial, marine and freshwater gradients, necessary for the prior development of the necessary guidelines for their development and implementation ; • Elaborate a Planning for the use of land and the maritime space, that ensures the conservation of biological diversity ; • Develop specific protective measures on the landscape as a way of preserving habitats and species that do not fall on the Special Areas of Conservation in the marine environment ; • Establish animal reserves or marine sanctuaries, and as well as a Center for Marine Biodiversity.		

[130] http://www.magrama.gob.es/es/biodiversidad/servicios/banco-datos-naturaleza/informacion-disponible/descargas_es.aspx

6. Annex I - Detailed description of the sources on maritime economic activities

The following table refers to section 2.1 “Overview of relevant maritime economic activities” (Table 2.1). It provides an overview of relevant figures sourced from Eurostat, Official national statistical sources or alternative sources (as indicated by the columns of Table 2.1). Appropriate references are supplied.

Table 18 – Selection table of the most relevant figures and detailed references

Maritime economic activity		Source	GVA (€ m)	employment (abs. nrs)	Comments
0. Other sectors					
0.a	Shipbuilding and repair	Eurostat	**1 392**	**24 122**	
		National statistics	937	23 238	combination of Eurostat and National statistics
		Alternative	844	39 000	Innovamar, 2011
0.b	Construction of water projects	Eurostat	**945**	**19 813**	
		National statistics	945	19 813	combination of Eurostat and National statistics
		Alternative	n/a	n/a	
1. Maritime transport					
1.a	Deep-sea shipping	Eurostat	**621**	**8 864**	No data on NACE 77.34 and 52.22 available
		National statistics	622	8,857	combination of Eurostat and National statistics
		Alternative	1 129	13 000	Innovamar, 2011
1.b	Short-sea shipping	Eurostat	**649**	**9 262**	No data on NACE 77.34 and 52.22 available in Eurostat
		National statistics	650	9 255	combination of Eurostat and National statistics
		Alternative	incl. in 1.1	incl. in 1.1	
1.c	Passenger ferry services	Eurostat	**353**	**5 582**	No data on NACE 77.34 and 52.22 available in Eurostat
		National statistics	353	5 578	combination of Eurostat and National statistics
		Alternative	n/a	n/a	
1.d	Inland waterway transport	Eurostat	**4**	**94**	No data on NACE 77.34 and 52.22 available in Eurostat
		National statistics	6	115	combination of Eurostat and National statistics
		Alternative	incl. in 1.1	incl. in 1.1	
2. Food, nutrition and health					
2.a	Fisheries for human consumption	Eurostat	**3 720**	**129 230**	JRC (fishing), Eurostat (fish processing, wholesale & retail), PRODCOM (share of human/animal)
		National statistics	3 820	131 440	National Statistical, JRC (fishing), Eurostat (fish processing, wholesale & retail), PRODCOM (share of human/animal)
		Alternative	902	33 210	Marine Fishing Economic Survey, 2011
2.b	Fisheries for animal consumption	Eurostat	**12**	**454**	JRC (fishing), PRODCOM (share of human/animal)
		National statistics	1	24	National Statistical, where not possible JRC (fishing), PRODCOM (share of human/animal)
		Alternative	1 693	45 000	Innovamar, 2011; Data includes 2.1 and 2.2 and 2.3
2.c	Marine aquatic products	Eurostat	**130**	**22 882**	JRC
		National statistics	130	22 882	JRC
		Alternative	137	27 072	Marine aquaculture, 2010 - Aquaculture economic survey
2.d	Blue biotechnology	Eurostat	**n/a**	**n/a**	
		National statistics	n/a	n/a	
		Alternative	n/a	n/a	
2.e	Agriculture on saline soils	Eurostat	**4 573**	**406 946**	
		National statistics	25 873	272 087	National Statistical completed with Eurostat,

Maritime economic activity		Source	GVA (€ m)	employment (abs. nrs)	Comments
					(agriculture in coastal NUTS-2 and percentage saline soils.
		Alternative	n/a	n/a	
3. Energy and sea bed materials					
3.a	Offshore oil and gas	Eurostat	**16**	**n/a**	Eurostat, GVA data 2008 (only NACE 09.10). No employment data in Eurostat on NACE 06.10, 06.20,09.10
		National statistics	16	n/a	Eurostat, GVA data 2008 (only NACE 09.10). No employment data in Eurostat on NACE 06.10, 06.20,09.10
		Alternative	n/a	n/a	
3.b	Offshore wind	Eurostat	**n/a**	**n/a**	
		National statistics	n/a	n/a	
		Alternative	n/a	n/a	
3.c	Ocean renewable energy	Eurostat	**n/a**	**n/a**	
		National statistics	n/a	n/a	
		Alternative	n/a	n/a	
3.d	Carbon capture and storage	Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	n/a	n/a	
3.e	Mining	Eurostat	**0**	**0**	No offshore aggregates mining in Spain according to UEPG
		National statistics	n/a	n/a	
		Alternative	n/a	n/a	
3.f	Marine minerals mining	Eurostat	**n/a**	**n/a**	
		National statistics	n/a	n/a	
		Alternative	n/a	n/a	
3.g	Desalination	Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	**382**	**4 186**	Global Water Insights (2010)
4. Leisure and tourism					
4.a	Coastal tourism (accommodation)	Eurostat	**6 596**	**206 397**	(data for NACE 55.10, 55.20, 55.30, 55.90)
		National statistics	7 102	252 265	combination of Eurostat and National statistics
		Alternative	n/a	n/a	
4.b	Yachting and marinas	Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	**3 303**	**62 107**	Innovamar, 2011
4.c	Cruise tourism	Eurostat	**232**	**3 670**	No data on NACE 77.34 and 52.22 available
		National statistics	232	3 667	
		Alternative	1 120	24 200	European Cruise Council, data for 2010
5. Coastal protection					
		Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	**50**	**498**	Eurostat COFOG; PRC the Economics of Climate change, data for 2008
6. Maritime monitoring and surveillance					
6.a	Maritime surveillance	Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	n/a	n/a	
6.b	Environmental monitoring	Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	**24**	**n/a**	EMODNET

7. Annex II – Growth rates of the maritime economic activities

Maritime economic activity		Indicator	Source	Availability	CAGR (2008-2010)	CAGR (2000-2012)	Notes
0. Other sectors							
0.a	Shipbuilding	Volume index of production, Gross data	Eurostat	2002 - 2012	**-11.8%**	**-8.7%**	
0.b	Construction of water projects	GVA	Eurostat	2008-2010	**-12.4%**	**n/a**	
1. Maritime							
1.a	Deep-sea shipping	Volume of deep sea cargo shipped, 1000 tons	Eurostat	2000 - 2011	**-7.4%**	**6.7%**	
1.b	Short-sea shipping	Volume of short sea cargo shipped, 1000 tons	Eurostat	2000 - 2011	**-2.9%**	**3.7%**	
1.c	Passenger ferry services	1000PASF - 1000 passengers (excluding cruise passengers)	Eurostat	2004 - 2011	**-4.0%**	**-1.2%**	
1.d	Inland waterway transport	1000 tonnes transported on inland waterways	Eurostat	no data			
2. Food, nutrition and health							
2.a	Fisheries for human consumption	Volume index of production, Gross data	Eurostat	2000 - 2012	**-2.5%**	**5.5%**	
2.b	Fisheries for animal feeding	Volume index of production, Gross data	Eurostat	2000 - 2012	-2.5%	5.5%	
2.c	Marine aquaculture	n/a			n/a	n/a	
2.d	Blue biotechnology	n/a			n/a	n/a	
2.e	Agriculture on saline soils	n/a			n/a	n/a	
3. Energy & sea bed minerals							
3.a	Offshore oil and gas	primary production of oil and gas in TOE	Eurostat	2000-2011	**9.1%**	**-8.3%**	
3.b	Offshore wind	n/a			**n/a**	**n/a**	
3.c	Ocean renewable energy	n/a			**n/a**	**n/a**	
3.d	Carbon capture and storage	n/a			**n/a**	**n/a**	
3.e	Mining	Marine Aggregates (millions tonnes) - UEPG data	Eurostat	2000-2012	**-14.6%**	**-6.2%**	No offshore activity according to UEPG; growth of production stone & sand quarrying
3.f	Marine minerals mining	n/a			**n/a**	**n/a**	
3.g	Desalination	n/a			**n/a**	**n/a**	
4. Leisure & tourism							
4.a	Coastal tourism (accommodation)	Index turnover, Gross data (all accommodation NACE 55)	Eurostat	2000 - 2012	**-4.8%**	**1.5%**	
4.b	Yachting and marinas	n/a			**n/a**	**n/a**	

4.c	Cruise tourism	1000PASC - 1000 cruise passengers starting and ending a cruise	Eurostat	2004 - 2011	**8.0%**	**18.5%**	
5. Coastal protection							
5.a	Coastal protection	n/a			n/a	n/a	
6. Maritime monitoring & surveillance							
6.a	Maritime surveillance	n/a			n/a	n/a	
6.b	Environmental monitoring	n/a			n/a	n/a	