

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

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0. Preface

This country paper 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:

Portugal's economic activity is experiencing a contraction since the beginning of the 2008 crisis. The fiscal adjustments' policies, i.e. confronting low levels of domestic demand against a background of lower permanent income prospects are some of the reasons attributed to this development. Gross Domestic Product of Portugal stood at € 165.11 bn in terms of GDP in 2012 which represented a decrease of 3.2%, as compared to 2011¹. In the first quarter of 2013 GDP further decreased with 3.9% in real terms (in comparison to the same quarter in the previous year). According to latest data provided by the Statistics Portugal (INE), the country recorded a population of 10 521 400 people in the 1st quarter 2013 with an unemployment rate of 17.7%².

Table 1.1 Regions in Portugal



¹ Statistics Portugal (INE), 2011, Website Data, Table A.1.1. Gross domestic product at market prices (annual) and Table A.1.1.8 - Gross domestic product at market prices (volume change rate; annual). Please note that the figure on GDP is a preliminary data calculation realised by Statistics Portugal (INE). Further information provided in Flash sheet "Destaque" of 11th of March 2013 set the GDP for 2012 in € 165.4 bn.

² Statistics Portugal (INE) Portugal, 2013, Boletim mensal de Estatística. Setembro 2013.



Source: Europa.eu

Between 1995 and 2011 the structure of the economy's total GVA changed markedly. In particular, the relative weight of services increased significantly- mainly composed by tourism, consulting and engineering services - in contrast to a marked decline in the relative importance of industry and agriculture. However, there was an increase in the relative weight of industry in the past few years, from 13.0% in 2009 to 14.5% in 2011. Notwithstanding that fact, the contribution of fishing and agriculture economic activities dropped to less than 2% of the country's GDP in 2012³. On the other hand, in 2011, industrial production of fishery and aquaculture dropped by 2.2%⁴. This was seen as a result of the structural adjustment of the economy produced by technological improvements in the first sector, and the subsequent diversification of the economic activity towards the industry and service sectors. Fishery Labour input plunged to half of the value recorded in 1986, and was 13.6%⁵ in 2008. According to the results of the Census, only 13 156 individuals worked in the fishing sector in 2011, representing 0.3% of the total employed population⁶.

In Portugal the decrease in the abundance of some commercial resources, like sardine, is a big challenge, having in mind the urgency to preserve the existing resources, along with the need to safeguard the economic viability of the fishing industry. In return, an accelerated increase of aquaculture activities has been observed, meeting a GVA of 5.3% in 2011 and constituting around 5% of the total fish production⁷. The urgency to preserve the existing resources, along with the need to safeguard the economic viability of the fishing industry is a major priority for the country.

³ Statistics Portugal (INE), 2012, Estatísticas da Pesca 2012 and Website Data. Tables 1.1.1. and Please note that value for Agriculture and fishing GDP is a preliminary data calculation realised by the Statistics Portugal (INE).

⁴ Estatísticas da Pesca, 2012. Statistics Portugal (INE).

⁵ Statistics Portugal (INE),

⁶ Estatísticas da Pesca, 2012, Statistics Portugal (INE)

⁷ Estatísticas da Pesca, 2012, Statistics Portugal (INE)

According to secondary literature⁸, the direct contribution of maritime activities amounts to about 2% of GDP and generates approximately 75 000 direct jobs. Another study⁹ sketches a less conservative economic outlook, pointing to values close to 2.2% of GDP although it also refers to the lack of consolidation in the national accounts that enables a more contextualized sampling. Overall, the direct contribution of the maritime economy amounted to about 2.5% of national gross value added in 2010 and 2.3% of national employment.¹⁰

The country as a whole had a positive performance in coastal and nautical tourism, including yachting and marinas and cruise tourism, with an increase in the recent years, both in GVA and employment, despite the economic crisis. It also improves in what concerns renewable energies, including off-shore (two examples are: the Windfloat, a demonstration wind off-shore project, and the Waveroller, a wave energy prototype). Ports activity have also increase in recent years, particularly the cargo movements in the Leixões Port in “Zona Norte” (12.3% increase from 2009 to 2011), in the Lisbon Port in “Lisboa” (2.9% increase from 2009 to 2011, and in Sines Port in “Alentejo” (1,1% increase from 2009 to 2011)¹¹.

1.2. Coastal regions¹²

Portugal has a long coastline: it approximately measures 2 587 km, thus including the continental territory (1242 km) and the archipelagos of Açores (943 km) and Madeira (402 km)¹³. In total, this represents 2.7% of the total EU coastline¹⁴. Besides, the country has one of the largest Economic Exclusive Zone (EEZ) in Europe covering more than 1 700 000 Km² (equal to more than 18 times the Country’s territorial space). LandScan reports that 49.6% of Portugal’s population, i.e. 5.2 m people, are living within 10 km from the sea.¹⁵

Geographical disparities can be observed, with Lisboa and Zona Norte being the most important regions regarding employment and GVA of the industry (representing ¾ of the country figures)¹⁶. They play a major role in terms of maritime economy, notably in shipbuilding, shipping (Lisboa) and fishing. The bulk of aquaculture production is concentrated in Zona Norte and the Algarve (representing over 90% of the production value).

Tourism, on the other hand, is gaining an important weight in the economy and is currently representing 8.8% of the national GVA¹⁷. Tourism accounts for 48% of employment of the total

⁸ Maritime Economy Hypercluster, 2009

⁹ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

¹⁰ Directorate-General for Political Sea (DGPM), 2012: Economics of the sea in Portugal. (document to support the National Ocean Strategy 2013-2020)

¹¹ Directorate-General for Maritime Policy, The Sea Economy in Portugal, December 2012 (document to support the National Ocean Strategy).

¹² 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: The region has a sea border; The region has more than half of its population within 50 km from the sea, that is based on the GEOSTAT 2006 population grid. Previous to the availability of this grid, all coastal regions were defined as a NUTS level 3 region with a sea border; Hamburg German region, not meeting either of the two previous criteria, but still included because of its strong maritime influence (Definition from Eurostat).

In the case of Portugal, the criteria is “Region with a Sea Border”, this is a total of 13 regions: Algarve, Alentejo Litoral, Península de Setúbal, Grande Lisboa, Oeste, Pinhal Litoral, Baixo Vouga, Baixo Mondego, Minho Lima, Grande Porto, Cávado, Açores and Madeira (Source Eurostat).

¹³ Anuário Estatístico de Portugal 2012, Cap. I, Cuadro I.1.2

¹⁴ European Union coastline is around 66 000 Km

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 10,514,844 (Portugal, 2012 figures, based on Eurostat).

¹⁶ Businesses in Portugal, 2010, Statistics Portugal (INE)

¹⁷ Yearbook of tourism statistics, 2009, Turismo do Portugal.

employment related to maritime activities¹⁸, as the country is widely known as a sun and beach destination within Europe counting with a wide accommodation and restoration infrastructure. The main touristic destinations are Algarve, Madeira and Lisbon.

The autonomous regions of the Açores and Madeira are characterised by their “ocean” touristic appeal, with a vast offer of water sports, whale watching, diving, leisure fishing activities and an increasing role of cruise tourism in Madeira. In the Azores, some activities have experienced a steady increase including activities such as surfing, scuba diving, whale watching, and shark diving. The Islands have rich and diverse natural resources (forest, wildlife, landscapes, etc.) although have unexploited development potential, mainly with respect to recreational boating. Highly dependent and almost entirely supplied by merchandise handled in Portuguese ports, the Islands meet an intense maritime transport traffic with the peninsula that is nonetheless poorly exploited towards new transport lines and business opportunities with the African Continent.

The port of Lisbon receives every year around 500 000 tourists coming, and the capital city hosts the major port of the country in terms cruise landings and the third port in terms of cargo transport. The Grande Lisboa region also concentrates the national shipbuilding and repair industry and is the fourth region in terms of fishery activities.

The Algarve region is the most southern Portuguese region of mainland Portugal, and the development achieved in the last decades reflects a dynamic tourism industry, specialised in the Sun and Beach product. Tourism has gradually been diversifying its business in leisure and sports products as golf or nautical and cruise tourism. The regional economy also maintains aquaculture and fisheries activities. In addition knowledge based activities begin to emerge especially related to marine science and research units in this scientific area.

Finally in Zona Centro main maritime activities are fisheries, aquaculture and to a more limited extent nautical tourism, shipbuilding.

¹⁸ Directorate-General for Maritime Policy, The Sea Economy in Portugal, December 2012 (document to support the National Ocean Strategy)

2. Marine and maritime economic activities

2.1. Overview of relevant maritime economic activities in Portugal

This section provides an overview of the main maritime activities and their related socio-economic impacts in **Portugal**. 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 aim is to use the same basic method for all countries;
- 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 activities¹⁹. More detailed information from all relevant sources is provided in **Annex I**. A separate Methodology Annex provides further explanation on the methodological assumptions and the underlying definitions that have been used.

Table 2.1 – Portugal - Overview of relevant maritime economic activities at country level

Maritime economic activity		GVA (€, m)	Employment	Number of enterprises	Source & Reference year for GVA and employment data
0.a	Shipbuilding and repair	83.2	3 472	349	Eurostat, data for 2010 combined with national statistics
0.b	Construction of water projects	83.60	1 520	54	Eurostat, data for 2010
1. Maritime transport					
1.a	Deep-sea shipping	121.73	1 758	108	Eurostat, data for 2010
1.b	Short-sea shipping	189.59	2 739	168	Eurostat, data for 2010
1.c	Passenger ferry services	35.58	698	91	Eurostat, data for 2010
1.d	Inland waterway transport	minimal	Minimal	n/a	
2. Food, nutrition and health					
2.a	Fisheries for human consumption	834.39	47 050	11 872	Eurostat, data for 2010
2.2b	Fisheries for animal feeding	4.51	281	44	Eurostat, data for 2010
2.c	Marine aquaculture	6.30	2 085	1 561	JRC, STECF (2013) Aquaculture only
2.4d	Blue biotechnology	n/a	n/a	n/a	Negligable
2.e	Agriculture on saline soils	119.68	24 604	n/a	Eurostat, data for 2010 (agriculture in coastal NUTS-2 and percentage saline soils.
3. Energy and seabed materials					

¹⁹ The maritime economic activities are consistent with the activities discerned in the Blue Growth Study. In deviation to this initial study Shipbuilding, the Construction of Water projects and fishing are added as separate economic activities.

Maritime economic activity		GVA (€, m)	Employment	Number of enterprises	Source & Reference year for GVA and employment data
3.a	Offshore oil and gas	0	0	n/a	Still in a study phase
3.b	Offshore wind	0	0	n/a	Still in study phase
3.c	Ocean renewable energy	minimal	Minimal	n/a	
3.d	Carbon capture and storage	0	0	n/a	Non-existent
3.e	Mining (sand, gravel, etc.)	0	0	n/a	negligible
3.f	Marine minerals mining	0	0	n/a	Non-existent
3.g	Desalination	minimal	Minimal	n/a	Some local hotel desalination installations
4. Leisure and Tourism					
4.a	Coastal tourism (accommodation)	905	44 155	2 028	Eurostat, data for 2009 (data for NACE 55.10, 55.20, 55.30, 55.90)
4.b	Yachting and marinas	n/a	n/a	n/a	n/a
4.c	Cruise tourism	38.65	758	n/a	(low estimate) Eurostat, data for 2010
		170	7 300	98	(high estimate) European Cruise Council, data for 2010
5. Coastal protection					
5.d	Coastal protection	6.3	100	n/a	Eurostat COFOG, data for 2010; PRC the Economics of Climate change, data for 2008
6. Maritime monitoring and surveillance					
6.a/ 6.b	Maritime surveillance	n/a	n/a	n/a	n/a
6.c	Environmental monitoring	n/a	n/a	n/a	n/a

2.1.2. Qualitative description of the maritime economic activities in Portugal

In the following text a brief description of the main characteristics of the maritime economic activities in the country is presented.

Shipbuilding and water projects

Shipbuilding and repair

Commercial and naval shipbuilding

According to COTEC, in general terms, shipbuilding in Portugal is a traditional and old sector that it is seen as a non-innovative industry. However, in recent years important and innovative projects are being developed within this sector, such as the Windfloat platform, the first floating offshore wind device in Portugal that has been assembled, installed and pre-commissioned in Lisnave shipyard, Setubal.

It is a relatively small sector within the Portuguese maritime economy and it has been decreasing in size over the last three years²⁰. In this sense, global orders are at a high number, which does not affect production levels at a global scale, amounting to 46 000 CGT (in 2011). In the same period, however, no production was recorded in Portugal. This is in contrast to the data recorded in the EU zone, with an order book of 5 794 000 CGT and a total of 2 446 000 CGT constructed²¹.

²⁰ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012.

²¹ According to figures communicated at the Conference: The shipbuilding industry in 2020: Economic potential and perspectives – AIN, Association of Naval Industries

In fact, the reduction in the number of new orders for construction and low freight rates in the international market has affected the domestic shipbuilding industry. In 2011, the turnover of repair / maintenance and naval shipbuilding (members of AIN), fell respectively 22% and 68% compared to the period 2001-2011²². The scarce domestic demand for this maritime economic activity has decisively affected its development along with other factors, e.g. the barriers to accessing debt finance²³. According to industry stakeholders, a supporting maritime cluster including the various maritime economic activities in Portugal (Hypercluster) would benefit in particular the domestic naval construction and maintenance activities²⁴. Besides, and according to some stakeholders, a more clear and active national industrial policy for the shipbuilding industry would provide a further boost²⁵.

It is a labour-intensive industry, which employed 3 500 people in 2010 (Table 1.1.). Around 75% of turnover is concentrated in a reduced number of large companies, in particular *Estaleiros Lisnave*, the largest shipyard in Portugal, Arsenal do Alfeite and Estaleiros Navais de Viana do Castelo. The rest of the sector is made up of a small number of naval shipyards and several fragmented SMEs devoted to fishing, recreational boating, sport and traditional boats construction and repairing.

Construction of leisure boats

Regarding the leisure boats sector, in Portugal, most marinas are served by shipyards that are installed in their own or nearby marina and providing repair and maintenance services to vessels that are parked there. Portugal, with the exception of some manufacturers of marine equipment, especially for the canoes and surfboards (such as companies like Sea Rib's, Setamar, Rivernaut, Tagus Yacht Center or OBE & Carmen), has not developed an industry in shipbuilding and repairing of recreational boats, which to some extent is understandable, given the weak domestic demand for leisure activities and marine tourism.

Construction of water projects

According to Eurostat data this sector offered employment to some 1 500 people in 2010. Construction of water projects in Portugal has taken place and is foreseen in many different areas, especially in ports and harbour infrastructures. In this sense it is important to mention the following public and private initiatives that are underway or ongoing²⁶:

- Leixões Port: several works develop and foreseen amounted to more than €300 m, such as the construction of Port Logistic Platform;
- Lisboa Port: Construction of the New Container Terminal Trafaria (under study) and the cruise terminal in Lisboa and Santa Apolonia;
- Sines Port: important initiatives foreseen like the extension of the East quay extension, the container terminal and the Liquefied Natural Gas Terminal and the construction of the new container terminal in Vasco da Gama. It is estimated that the total investment would rise to the overall amount of €1 300 m.

Overall, investments in ports and related infrastructure have seen a slight positive trend in Portugal.²⁷

²² According to figures communicated at the Conference: The shipbuilding industry in 2020: Economic potential and perspectives – AIN, Association of Naval Industries

²³ Maritime Economy Hypercluster, 2009.. Please note that evidence, that this is related to other factors, e.g. a lack of small companies providing components or a lack of trained staff (skills), could not be found through our literature review.

²⁴ Maritime Economy Hypercluster, 2009

²⁵ A industria naval no horizonte 2010,

http://www.ain.pt/index.php?mod=articles&action=viewArticle&article_id=217&category_id=66

²⁶ Strategic plan for transport. Sustainable mobility, 2011-2015

²⁷ This is partly due to the liberalisation process of the ports and infrastructure with investment having increased capacity and productivity having improved. See also: The Economist, 24th March 2012: Building euro-zone competitiveness. Ports in the

Maritime transport

The sea is a unique strategic asset for Portugal. The favourable location of the border of Portugal in Western Europe, where maritime traffic converges from worldwide, its long coast line and the size of its Exclusive Economic Zone are unique competitive advantages for this country. Bearing in mind the importance of maritime shipping in the international trade, the port and maritime sector plays a key role to foster the development of the country, the economy, and in particular the exports.

In Portugal, 67.5 m tonnes of seaborne goods were handled in continental ports²⁸, of which, 41% corresponded to liquid bulk goods, 24% to solid bulk goods and 35% to general cargo. Between 2009 and 2011 there was a 10% increase in total movement of goods.

First, the movement of general cargo has increased by 35% between 2009 and 2011, resulting in a sharp increase in the transportation of breakbulk and containerized cargo (44% and 34% respectively). The ro-ro cargo dropped by 15% between 2009 and 2011. Second, the movement of solid bulk cargo has shrunk by 5%. While the transport of coal and agricultural products has declined during the years under review (23% and 9% respectively), the movement of minerals and other bulk solids grew 50% and 10% respectively between 2009 and 2011. Finally, the movement of bulk liquids has risen 3% between 2009 and 2011, which is mainly due to 32% growth in the transportation of other bulk liquids (which includes the transportation of liquid natural gas) and 1% increase in the transport of goods petroleum. The movement of crude oil declined 0.15% between 2009 and 2011.

In terms of specialization by port, the ranking is led by Port of Sines holding a share of 39% of all goods loaded and discharged in mainland Portugal. It is followed by the Port of Leixões with a share of 24%. The Port of Lisbon ranks third in the country with a market share of 18% of all goods transported in mainland Portugal. It is observed that the ports of Sines, Lisbon and Douro and Leixões hold a nearly uniform share in terms of general cargo (breakbulk, containerized and ro-ro). Regarding the bulk solids, the Ports of Douro and Leixões hold a share of only 15% of the total volume of this type of goods, while the Port of Lisbon and Porto de Sines hold a share of 28% and 25% respectively. The transport of liquid bulk is led by the Port of Sines, with 59% of the total volume of cargo handling for this type of goods, while the Ports of Douro and Leixões move 28% of all bulk liquids transported in continental Portugal²⁹.

In terms of ports, Portugal holds strategic positioning along the Atlantic coast of the Iberian Peninsula at the crossroads of major shipping north-south and east-west routes, whose full use should be made based on ports capability of receiving the largest ships of the intercontinental traffic, including port container. The Port of Sines, one of the few deep water ports at European level, is currently one of the few ports on the Atlantic coast of the Iberian coast capable of meeting those requirements, and it can act as gateway of goods shipped to Europe. However, the necessary freight railway infrastructure should be developed to connect it to the center of Europe. This infrastructure should connect the Portuguese Ports in a smart and competitive network for the hinterland and to provide more ecological friendly transport alternative routes.

storm - Portugal needs to privatise its ports to reap the full benefits of its location. The latest in our series on reforming Europe's economies. See here: <http://www.economist.com/node/21551072> (last accessed on 25th Sept. 2013).

28 No data available for Madeira and Açores region

29 Port Statistics, IPTM - Institute for Ports and maritime transport and Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

Ports sector has been subject to new policies and progressed greatly in their form of organization and government. The importance of the maritime-port sector for Portugal is reflected in the priority assigned to it in the context of public policy. As from 1984 Portugal's ports have gradually moved to an intermediate public-private "landlord" model where ownership and port administration are public, but the port operation itself is concessioned to private groups³⁰. This liberalisation process has improved their capacity and productivity and has been able to attract considerable investments amounts since the 90s until today³¹. At present, notwithstanding the current need for budgetary consolidation, this is still one of the sectors in which the public investment efforts are maintained to improve the competitiveness of the country and contribute to overcome the current country's economic and financial situation, boosting exports, growth economic development and job creation. In fact, the Strategic plan for transport. Sustainable Mobility 2011-2015 approved to meet the EC, the ECB and the IMF³² requirements foresees important investments in different locations such as: Viana do Castelo, Figueira da Foz, Leixões, Aveiro, Lisboa, Setúbal and Sines (see above: "construction of water projects").

However, some bottlenecks, still persists and further improvements are needed. First, it is necessary to increase competition and transparency when it comes to public tendering process (this would reduce service costs and would improve the services provided by private companies). Second, the unions must be tackled³³, and finally Portugal should improve the governance model of the ports system³⁴ and reconsider its role as a port landlord³⁵.

Unlike the positive trend in terms of investment and improvements in ports' infrastructure, national maritime transport companies have not followed the same evolution. The fierce competition in international shipping and the fact of being a capital-intensive sector have pushed national shipowners to merge on large business groups or to concentrate almost exclusively in coastal traffic and insular maritime transport. As a matter of fact, as of June 2013 the Portuguese Fleet counted 114 vessels, representing a total of 1 589 530 deadweight tonnes, relatively small taking in hand the vast extension of the country's EEZ³⁶. The sector has a total of 19 national shipowners essentially engaged in transport operations between the mainland and the islands of Azores and Madeira, although some are now beginning to diversify their services to transport lines linking Portugal with Africa, or even the intra- European short sea shipping. Few companies - namely Portline, Naveiro and Transinsular with 12, 10 and 8 ships respectively- operate outside Portugal.

As a result of the above, the country has a much more robust economic performance in the port sector than in the shipping industry. This decline of the Portuguese merchant shipping, according to the White Paper on Maritime Policy-Port³⁷, negatively affects the presence of Portugal in world markets for goods and traffic, limiting the country's autonomy, to provide or obtain essential products for its economy, and import or export them from/to more convenient places, causing the loss of opportunities generated by international traffic from other countries, such as Africa and Latin America.

30 Ports in the Storm" – The Economist, 24 May 2012

31 Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

32 Memorandum of Understanding on Specific economic policy conditionality, CE, BCE, IMF and Portuguese Government

33 Also stated in the as stated in the MOU: *Portugal should revise the legal framework governing port work to make it more flexible, including narrowing the definition of what constitutes port work, bringing the legal framework closer to the provisions of the Labour Code*

34 Memorandum of Understanding on Specific economic policy conditionality, CE, BCE, IMF and Portuguese Government

35 Ports in the Storm" - The Economist, 24 May 2012

36 Shipowners and Ships, Maritime Transport Department of the Ports and Maritime Transport Institute, June 2013.

37 White Paper of the Maritime and Port Policy Towards the XXI Century

Deep sea shipping in Portugal

Deep sea shipping represents some 40% of maritime transport in Portugal (both in terms of goods handed and economic activity) (based on Eurostat). The commercial ports sector has had a significant economic development, accompanied by a diversification of infrastructure and port services, associated to increased availability of skills and capabilities to meet significant traffic requirements, such as import / export activities and transshipment of containerized cargo and petroleum products, natural gas and coal.

Short sea shipping

Some 60% of all goods handled in Portuguese ports are categorized as short sea shipping. Short sea shipping is divided into the activities of feeding, coastal trade (“cabotage”) and micro coastal trade as well as river transport, including the recently created Highways of the Sea. Feeding combines deep sea transport with the redistribution through secondary ports in smaller boats, structuring the activity in a small harbours network around a main port. Coastal trade consists in transports of passengers and goods among a country’s ports or at the EU scale, among EU ports. Short Sea shipping is strongly promoted in both European and Portuguese policy hence making it conducive to continued growth. In 2011, Portugal reported growth rates of more than 20% in short sea shipping of TEUs compared with the previous year³⁸.

In the framework of the Motorway of the Sea to promote the use of short sea shipping in the EU zone, the Commission has envisaged the creation of a *Motorway of the Sea of Western Europe* (leading from Portugal and Spain via the Atlantic Arc to the North Sea and the Irish Sea). Nonetheless some major difficulties should be mentioned regarding the construction of the Maritime Motorway in Portugal water land: the long distance between the different countries’ ports and their specificities demand flexible and integrative ways to adapt to the circumstances of the Atlantic space. Despite these differences, all states are aware of the importance the project entails and had created a logical integration of its services and maritime infrastructure, where the leadership in the preparation of various initiatives was assumed by France, Ireland and Spain. Portugal has also progressed with projects in this area in the ports of Leixões and Sines³⁹.

Passenger ferry

Various ferry operators are active in Portugal, including: Atlanticoline and Transmaçor (operating ferry services in the Azores Islands), Transtejo & Soflusa (operating services from Lisbon across the Tagus river) Atlantic ferries (operating services in the river Sado estuary), or Porto Santo Line (regular ferry between the islands of Madeira and Porto Santo). In 2008, a new ferry service was launched from Portugal (from the port of Portimão in the south) to Madeira. This was the first ferry connection between the island and the mainland for over 30 years. As a result of this new ferry service this activity presents one of the biggest growth rates from 2008 to 2010. However, this ferry was subsequently closed. Although it’s social relevance and need remains, promoters are not showing interest in its operation.

The other important ports on the Portuguese continent in terms of passenger movements are Lisboa port (Lisboa Region) and Leixões in the Norte Region. According to statistical data from 2010, more than 700 566 passengers were transported among those ports in 2010. This is combined with an active development of a river taxi system along the river Tagus shores by the Lisbon City Hall and Turismo the Lisboa as part of a wider promotion of these areas. Smaller in

³⁸ http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Maritime_transport_statistics_-_short_sea_shipping_of_goods

³⁹ Portmos report D13 – Organisation and configuration of pilot actions for the development of the motorways of the sea in Portugal, Portuguese Ports Association
http://ec.europa.eu/transport/modes/maritime/studies/doc/mos/portmos_final_report_global_d13.pdf

volume but also important in terms of passengers movement is that among eight of the nine islands of the Azores, with a total of 480 921 passengers transported in 2010.

Inland waterway transport⁴⁰

Inland waterway transport in Portugal is negligible in volume and focuses mainly in passenger transport and tourism. Fluvial activity in major rivers could be summarised as it follows:

- Douro river: The river provides a waterway of around 210 km, available for maritime tourism and recreational navigation. Commercial shipping is only possible in an area of 102km, between Porto and Ruler, due to limitations in the Tua zone that limit the passage of vessels of greater tidal shift - up to 2 500 tonnes. The number of ships entering the ports of the Douro river showed a slight decrease (6.3%) since 2010;
- Tagus river: River Tagus has good natural conditions to be navigable and offers several possibilities for waterway uses. Nonetheless to be navigable, important investments and regularisation works are needed, since the current conditions only allow cargo barges movement up the Valada river zone. As part of the promotion of Lisbon as European Atlantic Capital by the Lisboa City Hall and active development of the river shores is promoted and supported;
- Algarve Region: In 2011, transport movements in the Algarve inland rivers, mainly to the Ria Formosa islands and between Vila Real de Santo António and Ayamonte, reached 2 085 272 passengers;
- Guadiana River: Potentially navigable up to Mértola, the Project Guadiana, cofinanced by the FEDER, aims to improve the navigation characteristics of the river, both in the Spanish and Portuguese stretch to enhance sustainable tourism, sports and recreational use.

Food, nutrition and health

Fishery

Fishing and its subsidiary activities, such as fish processing and wholesale, constitute an industry with huge tradition in Portugal and with a high importance in terms of social and economic contribution.

One of the main features of this sector is its fragmented structure composed of a vast number of SMEs and small vessels with a crew of one or two people. The Portuguese fleet is highly diversified with a broad range of vessel types (9types of gears with different vessel length) targeting different species predominantly in the Portuguese Exclusive Economic Zone.⁴¹ On December 31, 2012 a total of 8 276 vessels were registered in the national fishing fleet register, representing a total gross tonnage of 99 836 GT. Small vessels with a gross tonnage of less than 5 GT accounted for about 84.2% of the total number of vessels, although they represented only 8.4% of the total tonnage. The large vessels (over 100 GT) accounted for only 2.4% of the total number of vessels, holding approximately 68.2% of the total tonnage⁴².

This fact led to the creation of *Organizações de Produtores* (Producers Association), implemented with the aim to organize producers and to allow them to lobby in several subjects of fishing activity. In the meantime, these organisations have evolved and some of them have become major producers, distributors and fish processors. In 2012, 33% (equal to 1 525 units)⁴³ of the

40 Inland waterway in Portugal - The use of the major rivers - http://www.revistademarinha.com/index.php?option=com_content&view=article&id=1150:navegacao-fluvial-em-portugal-o-aproveitamento-dos-principais-rios-portugueses&catid=106:marinha-mercante&Itemid=390

41 The 2012 Annual Economic Report on the EU Fishing Fleet (STECF-12-10) (JRC) <https://stecf.jrc.ec.europa.eu/reports/economic>

42 Fishing statistics Report 2012 (Estatísticas da Pesca) – Statistics Portugal (INE)

43 Fishing statistics Report 2012 (Estatísticas da Pesca) – Statistics Portugal (INE)

licensed vessels in Portugal were members of Producers Association, corresponding to a decrease of 2.1% compared to the previous year.

The total number of employment for licensed fishermen - a group characterized by higher age groups with lower levels of formal education - has decreased⁴⁴ during the period 2008 and 2012⁴⁵.

Fishing has maintained in recent years, almost constant level of fish catches, however, it is remarkable its low productivity index: average production per fisherman is below 10 tonnes per year against averages above 20 tonnes in other European countries⁴⁶. One of the reasons that might explain that is the fact that artisanal fishing continues to be the most prevalent "business model" of this economic sector in Portugal implying important losses in terms of productivity. The need to improve the scientific knowledge of stocks exploited by the Portuguese fleet as well as the technologies applied to the fish transformation are other factors that hampered the sector's productivity. Regarding the latter, the way should be the commitment on quality, with product differentiation through the know-how quality, thus directing the production to niche markets of higher added value.

Moreover, the majority of the Portuguese fish processing enterprises are small companies with less than 11 employees. By contrast, only 2% of the enterprises have more than 250 employees⁴⁷. The trade balance for the fishing sector and related activities is negative, since imports of fish have grown (Portugal is the largest consumer of fish in the EU and the fish demand is high). Nevertheless fish processing products have a positive trade balance.

The profitability of fishing enterprises is also poor, given that the most lucrative part of the value chain corresponds to the final stages of this chain, especially in the sale to the final consumer.

The sea areas under Portuguese jurisdiction do not have particularly high levels of fish stocks. With the exception of some migratory species, commercially exploitable fish stocks tend to be coastal species captured in small quantities in the coastal areas (accounting only for 2% of the total Portuguese Exclusive Economic Zone). However, those areas are especially rich in terms of variety of fish stocks and also the quality of the products is considered to be excellent.

Therefore, and given the relative scarcity of natural resources, according to Cotec Portugal⁴⁸, the focus should be set on the quality and variety of the fish rather than on the quantity. It is essential to create a brand attached to the product and particularly generate a national brand of seafood. For that it will be necessary to advance to certification schemes denomination of fish, origin certification, quality certification and also the certification of sustainable fisheries. Moreover, the sector must also improve and modernize its managing structure and restructure the market and the fishing trade. Furthermore, the appreciation of the fish through the transformation emerges as another way to improve economic performance of the fishery. Those measures will increase competitiveness and employability in the sector.

The majority of fish caught in Portugal in **fish for human consumption**. Regarding the processing fish industry, in 2011 the manufacturing fisheries and aquaculture industry presented a joint

⁴⁴ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

⁴⁵ whether this has pure economic reasons and a decreasing return on investment of the fishermen, due to increasing scarcity in fish stocks, or whether it is linked to the economic crisis could not be assessed through desk research.

⁴⁶ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

⁴⁷ Economic Performance of the EU Fish Processing Industry Sector (STECF-OWP-12-01)
http://stecf.jrc.ec.europa.eu/documents/43805/324157/2012-02_STECF+OWP+12-01+-+Fish+Processing+Sector_JRC69584.pdf

⁴⁸ Cotec is a Business Association for Innovation chaired by the President of the Portuguese Republic

production of 207 000 tonnes of "frozen", "dried, salted" and "prepared or preserved" fish, which represented a decrease of 2.2%⁴⁹ compared to the previous year. Regarding the structure of production activities, "frozen" fish category ranked first, followed by the group of "dry and salty" fish in the second place and "prepared or preserved" fish in the third place, the latest reinforcing its relevance in the Portuguese processing industry⁵⁰.

Within this sector, it is worth noting the cod processing activity which is the largest subsector within the fish processing industries - where the 3 main companies of the country together represent 60% of cod processing production turnover. Nonetheless, the industry is heavily dependent on imported raw materials, given the sharp decline in cod catches made by the national fishing fleet.⁵¹

Marine aquaculture

Aquaculture⁵²

Portugal has favourable natural conditions to the development of aquaculture production, stemming from its physical and geographical conditions (extension of the coastline and the intrinsic quality of the sea), and a growing domestic and international demand for fish and the fishing quotas. In this scenario, aquaculture is seen as an important alternative to traditional forms of fish supply.

Notwithstanding that potential, the sector is still in an embryonic stage, having produced only about 9 000 tonnes (in 2011), mainly bivalves representing 1.5% of the domestic fish consumption⁵³. This production has corresponded to an income of €58.2 m (increase of 20% compared to 2010⁵⁴). Partly, this is due to the fact that only a small percentage of those areas with optimal conditions for aquaculture are being explored to date. As a result the turnover of aquaculture products in Portugal is relatively low. The production of aquaculture represents less than 10% of the caught fish, which is well below European levels (25%) not to mention global levels.

It is an industry characterized by the presence of a large number of small family firms under extensive exploitation and producing bivalve molluscs and with some big players having a dominant position. This is evidenced by the fact that the entry in the market of Acuinova (Group company Pescanova) has caused a growth of 76% of turnover in the sector. In fact, Acuinova⁵⁵ generates a turnover that is 40% of the turnover of the largest 50 companies. In 2010, around 1,500 active establishments could be counted 94 % of them were bottom culture, 4 % were ponds and tanks and 2 % were floating structures. They offered direct employment to some 2,300 people.

Catching fish for animal feeding is essential for aquaculture and in Portugal is dominated by a single company, Aquasoja Sorgal Group. It sells more than 20 tonnes in Portugal and abroad, including in the Iberian market, South American and Asian markets. Other important companies are Narciso Dias in Peniche, Sorgal and Empresa Figueirense de Pesca (Figueirense Fishing company) which producing oil and fish meal also necessary for the aquaculture industry.

⁴⁹ Fishing statistics Report 2012 (Estatísticas da Pesca) – Statistics Portugal (INE)

⁵⁰ Fishing statistics Report 2012 (Estatísticas da Pesca) – Statistics Portugal (INE)

⁵¹ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

⁵² The Economic Performance of the EU Aquaculture Sector – 2012 exercise (STECF-13-03)

http://stecf.jrc.ec.europa.eu/documents/43805/410684/2013-04_STECF+13-03+-+EU+Aquaculture+sector_JRC81620.pdf

⁵³ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

⁵⁴ Fishing statistics Report 2012 (Estatísticas da Pesca) – Statistics Portugal (INE)

⁵⁵ It has entered into an arrangement with creditors (summer 2013)

Important barriers for future growth are the obsolete production methods, barriers to accessing the credit, difficulties in obtaining production licenses or the lack of maritime and coastal development plans establishing specific areas to develop aquaculture activities. Another one is related with the fact that the majority of the productions units are located in protect areas, which don't allow production methods that make use of more advanced technology equipment.

However some positive actions have been taken recently. In this sense on January this year it has been approved by the Portuguese Parliament a resolution urging the Government to approve specific measures to support the sector by improving its competitiveness and sustainability⁵⁶.

Algae

Portugal counts with an important historical experience in collecting algae to be used as fertilizers. Although, this activity declined with the rise of chemical-based fertilizers during the twentieth century, some remnants of this activity can still be found on the North coast and in the Ria de Aveiro. Also in the seventies, Portugal was one of the largest producers of Agar in the world. Over-exploitation of algae and changes in the marine ecosystem accelerated the decline of this industry since then.

The actual algae production expression in Portugal is much less than in the past. In 2012, twenty permits were given and the production totalized 267 tons, corresponding to € 386 995⁵⁷.

Nevertheless, for the future, and given that the waters of the mainland and the Azores are good production regions of various species of agarofito algae and the vast tradition in the country, it seems reasonable that Portugal could development a market niche in the algae production and farming both for human consumption or to be used in various industries, including animal feed, cosmetic and pharmaceutical products and potentially the production of biofuels and biomass for energy purposes.

Although formally not part of this sector **salt production** is also a sizeable activity in Portugal. Weather conditions, the extent of Portuguese coast along with the biophysical characteristics of the sea makes the country a suitable place for producing salt. The Algarve with about 20 companies operating in this sector is the main producing area of sea salt (representing over 95% of the total production). Nowadays, traditional salt and high added value, such as *fleur de sel*, have gained importance and are considered as a new trend. This has lead to a revitalization of the Portuguese salt production activities although without sufficient impact to change the trend of declining production in recent years.

Blue biotechnology

Marine biotechnology, along with underwater robotics or ICT companies are among the so-called "new uses and resources of the sea". They form an emerging sector in Portugal and in view of its extended maritime area, Portugal could eventually be a major player in this industry. The Blue technology industry is considered one of the most promising activities of the maritime economy in the country. Some estimates assign a growth rate of 5% per year in all components from marine biotechnology, marine ingredients, aquaculture and exploitation of algae for human consumption, but also for use in therapeutics, bio remediation, cosmetics and nutraceuticals.⁵⁸ A current growth rate of the Blue biotechnology in Portugal (2013) is not available.

⁵⁶ Parliament Resolution n.º 6/2013, <http://dre.pt/pdf1sdip/2013/01/02100/0058900589.pdf>

⁵⁷ Directorate-General for maritime Policy (DGPM), The Sea Economy in Portugal, December 2012 (document to support the National Ocean Strategy 2013-2020)

⁵⁸ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012.

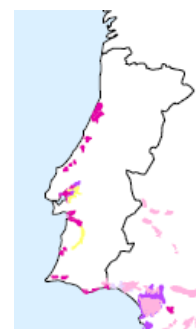
As part of the new EU policy on developing a bio-economy in Europe⁵⁹ new opportunities for nature based research are expected to be created and the further development of a bio-based economy will be stimulated. This also includes new opportunities for marine biotechnology stakeholders.

Currently some companies are already operating and well positioned, e.g. Bioalvo, S.A, Ceramed, Stemmaters, Necton, and also Sparos, Fish Care, Marsensing or Abyssal among others. The latter are often highly innovative start-ups and spin-offs from universities and Sea Research Centres. Therefore they are small enterprises operated by few young and highly skilled employees producing high added-value products, generally for the international markets. It is also worth mentioning the role of IBET, the “Instituto de Biologia Experimental e Tecnológica”, created in 1989, which is a private non-profit institution and the largest Biotechnology Research Organisation in Portugal. IBET acts as an interface between institutions and industries and as a support to its autonomous knowledge. IBET brings together, as partners and collaborators, private companies and public institutions, creation leading to competencies for product and process development.

Nevertheless, those efforts have to be accompanied by an innovative industry serving the world market for biotechnology able to absorb the solutions developed by the scientific research, as well as political measures and initiatives to incentivize this sector.

Agriculture in saline soils

Based on Eurostat data the number of people employed in agriculture on saline soils is estimated at some 700 000. According to JRC saline soils are found at various places along the Atlantic and Mediterranean coast (see coloured areas marked in the map on the right hand⁶⁰. Any information with regard to growth in the output (growing/ shrinking production) could not be retrieved through literature research. Similarly, information on the types of crops in the saline soils was missing.



Energy and seabed materials

Portugal, despite being the European country with the largest offshore area, still lacks a truly economic sector dedicated to the offshore energy since this industry has not yet got past the exploration stage in the case of fossil fuels, and has not reached yet the stage of commercial exploitation of renewable energy.

Therefore, it is crucial for the Portuguese economy to boost those sectors, especially considering its high dependence on imported energy. Moreover, the impact of this new industry and its ability to induce economic development is notable. Indeed, those offshore energies requires large investment amounts and it forces development of ports, industrial design, construction of offshore structures, as well as the development of underwater grids, transportation and turbine installation, and still other necessary activities (and highly profitable) to support the operation and maintenance of offshore infrastructures. Its potential in terms of converting old and obsolete shipyards into manufacturing companies of offshore wind structures is remarkable.

Offshore oil and gas

The weight of this sector within the maritime economy in the country is rather small. Only from 2007 onwards, the Portuguese Government has allowed exploration in various locations off the coast of

⁵⁹ See Communication on a Bioeconomy for Europe (COM(2012)60 final) and the related ABS regulation and ratification of the Nagoyo protocol.

⁶⁰ <http://eusoiils.jrc.ec.europa.eu/library/themes/Salinization/Resources/salinisation.pdf>

mainland Portugal. Nevertheless, to date no drilling has yet undertaken, meaning that there is not yet any certainty about the existence of fossil fuels in the maritime basin.

From 2007 to May 2012 the total investment was around € 165m that has been fully supported by the concessionaires. If the results are positive, it is expected the emergence of an entire industry with the positive affects that it implies in terms of job creation, investment, technological development and reducing the energy dependence.

Offshore wind

Offshore wind in intensity and regularity is superior to the onshore wind. Moreover, Portugal counts with important comparative advantages related to its specific geography. First, it has a vast maritime territory to develop those offshore renewable energies. Second, Portugal has a long coastline, which concentrates the bulk of cities and population and which it has optimal infrastructures in terms of grid, harbours and even shipyards to be used in the process of offshore renewable energy developing. On the other hand, the lack of an offshore industry to serve as a vehicle for the transmission of technologies and naval means, the lack of experience in developing industrial technology innovation and the limited financial capacity to invest in such projects may hinder the development of the sector.

According to the survey that was conducted in 2008 by INETI / LNEG for the fixed platform technology, the existing potential would be 3.5 GW (assuming a minimum of 2,700 hours per year of operation, which would allow production electricity corresponding to 9.45 TWh / year), or 2.5 GW (assuming a minimum of 3,000 hours per year of operation, which would result in the generation of 7.5 TWh / year). Regarding the floating platform technology and assuming that 40 GW can be installed implying an average of 3,500 hours per year of operation, will reach 140 TWh of electricity production.

According to the National Action Plan for Renewable Energy, the goal for 2020 the contribution of this technology will be 27 MW, which will be used primarily for research and technological development.⁶¹

In offshore wind Portugal is in a demonstration phase, with an installed capacity of 2MW in a pilot project, close to Aguçadoura (connected to the grid since September 2011)⁶². At this respect, it is important to mention the project Windfloat⁶³, the second large scale floating system that was installed off the Portuguese coast in 2011 and started to produce energy in 2012. Developed by Principle Power and EDP, it is equipped with a 2 MW Vestas wind turbine. It is the first offshore wind turbine to be installed without the use of any heavy lift vessels or piling equipment at sea. All final assembly, installation and precommissioning of the turbine and substructure took place on land in a controlled environment.

However, this, along with other initiatives currently underway, is still in an early stage. In the coming years, particularly from 2015, it is predicted that there will be a clearer understanding on the economic and technical viability of such projects.

⁶¹ RCM nº 20/2013, from 10 April 2013, page. 2076

⁶² Project conducted by EDP, Repsol, Principle Power, A. Silva Matos, Inovcapital and FAL.

⁶³ WindFloat Project – EDP –

http://ec.europa.eu/maritimeaffairs/policy/sea_basins/atlantic_ocean/atlanticforum/events/brest/presentations/forum_brest_maciel_en.pdf

Ocean renewable energy in Portugal

Wave energy

Although Portugal does not have high amplitude tides or strong currents, it is one of the European countries with a large potential for wave energy in particular on the West coast of Portugal. The specific characteristics of Portugal further offer some comparative advantages for marine energy production similar to offshore wind (see above). In addition, there are also two public support schemes in place, In addition Portugal has already conceded a pilot zone (DL238/2008) for the development of projects related to wave energy, which is expected in the future, can also come to accept projects exploring other marine energy resources. All those aspects will encourage wave energy in the country that is expected to reach an installed capacity of 6 MW by 2020⁶⁴.

Like the wind energy, the wave offshore energy at present is still in its testing and exploration phase. By its strong potential Portugal has been chosen for the development of several projects promoted by both Portuguese and foreign promoters, such as the Pelamis project in Aguçadoura, the Waveroller project called "Simple Underwater Renewable Generation of Energy - SURGE" in Peniche⁶⁵, or the Pico power plant in the Azores⁶⁶. It is also worth to mention the existence of important R&D organizations like the Instituto Superior Técnico or the Wave Energy Centre (WEC) by WavEC Offshore Renewables and the involvement in the European project MARINET (2015) a network of 42 testing facilities for marine energy projects, including the Pico plant. Another relevant project coordinated by WavEC is the Initial training Network, called Oceanet for wave energy as well as floating offshore wind.

Algae energy

In Portugal, the use of seaweed to produce renewable energy is being tested and is expected to become more important, either for production of next generation bio fuels, or for the production of biomass. Portugal has also in this area an appreciable natural potential, the biophysical characteristics of at least a part of its wide sea area, make it suitable to produce high amounts and in a relatively short time certain types of algae rich in ethanol.

With regard to algae energy, an important project in Portugal is the Seaweed Energy Solutions (SES), a joint initiative between Portugal and Norway to large-scale farming of algae in the sea to produce energy in the form of biofuels. SES is a Norwegian company that has operations both in Norway and Portugal. According to its web site, SES has since 2009 been involved in governmental sponsored seaweed projects with combined budgets of € 10 m. Funding has been obtained from The Research Council of Norway, Innovation Norway and others. Recently, SES got approved a € 2,5 m Eurostars project and 2 projects backed by the Norwegian Research Council of about € 3 m. However, there is no specific information regarding its activities in Portugal⁶⁷. In addition Algafuel should be mentioned, a spin off company dedicated to the development of bioengineering projects to produce microalgae energy, CO₂ capture and biomass production⁶⁸.

Carbon Capture and storage

n/a

⁶⁴ RCM nº 20/2013, from 10 April, page. 2077

⁶⁵ <http://aw-energy.com/concept.html#!/projects/project-surge>

⁶⁶ See www.pico-owc.net

⁶⁷ <http://www.seaweedenergysolutions.com/>

⁶⁸ www.a4f.pt

Mining (sand, gravel, etc.) and marine minerals mining⁶⁹

There are deposits of sands, sands gravel, glauconite and carbonates (shells) spread over the continental shelf, particularly in the west area, especially those located in the north of cannon Nazareth. There is also an important potential of geological mineral resources present on the Portuguese continental shelf. Mineralogical prospecting campaigns have been undertaken in order to determine the existence and localisation of gold, tin, ilmenite, heavy metals, sand, gravel, polymetallic nodules and crusts, polymetallic sulphides, sulphides and fosforites. Those campaigns detected in the deep area of the Continental Shelf, cover particularly the Atlantic northeast seamounts with a number of areas potentially rich in ferromanganese and phosphates. Moreover, Iron-Manganese rusts rich in cobalt have been found at Mount Submarine Antialtair (extended Continental Shelf). In the Azores, one dozen of enterprises dedicated to the exploitation of marine sand and gravel already operate throughout the archipelago.

The weight of this economic sector is quite small due to several reasons, such as the important requirements of capital investments, the lack of extraction technologies and market conditions that make it attractive for exploitation. However, the growth potential of the sector is important and should merit serious attention from the government and the largest Portuguese companies, particularly in the area of energy, or other heavy industries, since the return on their investments should also be very high. It would be also important to make an effort in terms of resources exploration and generate greater national knowledge about these activities through a real involvement from the education and scientific community. In this sense, the Marine Geology Unit within the National Laboratory for Engineering and Geology studies the geological resources immersed and its potential economic and performs mapping of the continental shelf and coastal areas, among other research activities.

Desalination

Two desalination plants are operating in the mainland of Portugal, in Algarve. Those plants, belonging to two hotel groups, are devoted to produce water to irrigate gardens, filling swimming pools, cleaning and leisure activities. There is another desalination plant in Porto Santo (Madeira), also securing fresh water for two hotels in the island. In the mainland, besides the expansion of one of the existing plants in Algarve to supply three more hotels, four new desalination projects to supply tourist resorts are foreseen in the Alentejo coast (1) and in the Algarve (3).

It is unknown the exact impact that this sector could have in terms of GVA and economic activity, since no data is available. Also the employment rate and investment in this activity is low, estimating a total amount of € 350 000 invested.

A major obstacle of desalination is its high consumption of energy, along with the low productivity of units that results in a high cost of exploration. In fact, those practices have raised controversy in Portugal. From the captured water, only between 35% and 40% is transformed into drinking water. The costs per cubic meter of treated water are about 53% higher than the “traditional” water sources, due to the high energy consumption required.

Given that a maximum annual volume of 14 174 m³ will be captured and that, only about 40% will be transformed into drinking water and the average production cost per cubic meter will be around € 14 176.50, the value of this production will be around an annual amount of € 10 844. This value is

⁶⁹ Marine Strategy for the subdivision of the Continental Shelf and the Extended Continental Shelf - Marine Strategy Framework Directive

negligible compared to the amount of water supply in Portugal, which may be justified by the high unit cost of production, due to the high energy consumption required.

For that reason, except for specific uses as the ones described above and for particular areas very close to the sea, desalination will probably not be in the coming years a significant economic activity in the country.

Leisure and tourism

Leisure and tourism is a large sector of the economy of the sea, which has enormous potential, particularly in a country with the geography and climate of Portugal. Nevertheless, in Portugal, this has not yet reached its full potential⁷⁰, in particular when compared with other European coastal countries.

There is a difficulty in estimating the turnover generated by the Nautical Tourism, as internal statistical services are not prepared to provide this kind of information. On the same hand, data within the country show high discrepancies. Taking in hand the estimative data provided by the *Hipercluster da Economia do mar* report, while the growth rate of the “Recreational Boating and Nautical Tourism” is of 8-10% per year at the international scale, in Portugal, the growth rate of the sector for the next 10 years can be higher – obtaining a cumulative annual growth rate of 11%, with a linear increase of 175%. This is due to a higher margin growth, as a result of the reduced volume of current activity and the great potential that the country has.

On the other hand, the *National Tourism Plan* states that nautical tourism is very susceptible to economic swings, and has stagnated during the last years, especially at the level of recreational boating. Despite all this, it recorded an annual growth of 0.5% during the last 5 years, which is less than the 9% recorded between 2000 and 2005. The future growth is estimated to be of 3%- 4% per year.

Either way, the sector has a significant potential of growing in the short term. At this respect, the National Tourism Plan⁷¹, recently approved, committed the country to become a main destination in Europe by offering a quality and added value product based on inherent distinctive features such as its natural environment, its history, culture and tradition.

The PENT will be implemented through a set of programs 11 structured in five main areas, namely quality sustainable tourism, enrichment supply, products and destinations, markets and accessibility and promotion and distribution. The maritime tourism plays a fundamental role in this plan. In this sense, two out of the 10 strategic products identified are related to this sector: “sun and sea” and “nautical and cruises”. The plan also mentions the thalassotherapy as one of the water-related activities to be boosted in the framework of the “health and wellness” industry.

Thus, in general, and regarding the coastal tourism, the plan is intended to diversify and add value to the already obsolete “sun and sea” model, by offering quality nautical activities inserted in integral touristic products benefiting from the Portuguese gastronomy, and the environmental, landscape, historical and artistic heritage.

⁷⁰ See for example CIITT Universidade do Algarve, (2008) Estudo sobre o perfil e potencial económico e social do turismo náutico no Algarve

⁷¹ National Strategic Plan of Tourism Proposals For Review On The Horizon 2015 - Version 2.0 - http://www.turismodeportugal.pt/Portugu%C3%AAs/turismodeportugal/Documents/PENT_Revis%C3%A3o.pdf

Besides, an increase of the quality of services, diversification of the products and a higher degree of attracting foreign customers, will contribute to the decrease of the seasonality of coastal tourism Portuguese. It is also crucial to make the government play an active role in developing this sector, in particular by reducing legal constraints, and bureaucratic administrative burden and by improving the infrastructures.

The development of the marine leisure sector will also have an effect on all the blue economy as a whole. It will foster the shipbuilding of leisure vessels activities, will boost territorial and maritime development and will put in place water plans and initiatives to convert those degraded coastal areas. It will also stimulate economic activity in coastal communities dependent on fishing activities. Finally, the development of the sector will contribute decisively to boost the Portuguese "maritime culture" that has been lost and that will determine the success of the maritime economy in general.

Coastal tourism (accommodation)

The component "Recreational Boating and Nautical Tourism" includes various types of activities, covering the different Water Sports - cruising, dinghy sailing, windsurfing, kitesurfing, surfing, boogie boarding, rafting, rowing, canoeing, kayaking, water skiing, jet skiing, sport fishing, spearfishing, diving - that can be practiced in the sea, rivers and estuaries, and natural or artificial lakes (reservoirs), and other more contemplative and / or resting activities such as simple stroll or sightseeing the coast and its attractions, such the thalassotherapy or Nautical Cruises.

Regarding results of the study realised by the Recreational Boating Working Group⁷², and given its relevance, recreational boating and cruise tourism sectors have been treated separately. The rest of activities are encompassed under the title "coastal tourism".

Coastal tourism is one of the largest maritime economic activities in Portugal directly employing almost 50 000 people and creating over € 1bn in GVA⁷³, corresponding to 39% of the GVA and 48% of the employment of the maritime economy as a whole.

With its long coastline including the archipelagos of Açores and Madeira, 86% (228 963), of the bedrooms and bed-places are located in the coast⁷⁴. Among them, more than 40% are in Algarve, the main tourist destination in Portugal⁷⁵. In addition Lisbon has been awarded various destination awards such as the recent CNN nomination as the Coolest City, making use of its combination of its unique and rich cultural heritage and its proximity to the river and the sea.

Moreover, according to *Turismo de Portugal*, there are over 600 tourist operators (OMT) operating in Portugal. In general, they are local companies with little or no infrastructure, few employees (the owner and 1 or 2 employees), who explore its activity in a particular beach or a marina.

A particular development in this sector is the fast increase of surfing in the country which has experienced a huge development in recent years, either in terms of practitioners, or services, or the number of tourists. According to the Portuguese Surfing Federation and the National Association of surfers, there are now about 165 surf schools in the country and are manufactured and sold over 4 000 surfboards per year, equivalent, with the other expendable supplies and services, to € 100 m annually.

⁷² « Recreational boating in Portugal a pillar of local development and economy of the sea », Recreational Boating Working Group, Maritime Economy Business Forum

⁷³ Directorate-General for Maritime Policy, The Sea Economy in Portugal, December 2012 (document to support the National Ocean Strategy)

⁷⁴ Capacity (No.) in hotel establishments by geographical location and type (property), 2009, Statistics Portugal (INE)

⁷⁵ Capacity (No.) in hotel establishments by geographical location and type (property), 2009, Statistics Portugal (INE)

Moreover, conducting world class nautical events, such as the America's Cup, Volvo Ocean Race, The Tall Ships Race and Extreme Sailing Series, has contributed to raise the positive image and the brand of “made in Portugal” and to attract an important number of tourists.

Yachting and marinas

Portugal has an extensive coastline between the main nautical routes and favourable conditions for practicing water and marine activities. In 2012, the maritime economic activity was featuring 38 infrastructures to access the sea, among which 58% corresponded to ports moorings, 26% to marinas and 16% to recreational docks. In terms of regional distribution, 65% supply is concentrated in the regions of Algarve and Lisbon, accounting for more than 7 200 berthing places⁷⁶ (35.1% and 30.1%, respectively). In the archipelagos of Açores and Madeira there are more than 2 400 berthing places. The Alentejo Region has the lowest share with 417 berthing places. Moreover, and when comparing the number of moorings per kilometre of coastline in Portugal (5) with the figures in the Netherlands (412), it becomes evident that the potential growth is immense.

Until 2007, the recreational boating was a growing activity in Portugal. Nevertheless, nautical tourism, very susceptible to economic fluctuations, stagnated in the recent years, especially at the level of recreational boating. Thus, the number of recreational boats and nautical licences has decreased in recent years. At his respect, Portugal stands behind the other countries in terms of the number of recreational boats per 1 000 inhabitants (6 boats vs. 174 and 136 in Norway and Finland).

Thus, given the low domestic demand, the future of this sector lays on the internationalization of recreational boating. Another important activity within this sector is the leisure shipbuilding and repair that has the largest profit margins within the shipbuilding sector.

Portugal, with exceptions of some manufacturers of marine equipment, especially for the canoes and surfboards, and minor repair and maintenance services provided by the marinas themselves to vessels that are parked there, has not developed an industry in shipbuilding and repairing of recreational boats, which to some extent is understandable, given the weak domestic demand for leisure activities and marine tourism⁷⁷.

Cruise tourism

Given the saturation of traditional routes and destinations in the Mediterranean and the Baltic Sea, Portugal is taking an important share of the cruise tourism, in particular in the Lisbon and Funchal Ports, but also in the Portimão and with growth expectations in other Ports such as the Leixões and Ponta Delgada.

Thus, cruise tourism is a growing industry in Portugal, based on foreign operators calling at Portuguese ports. In fact, the scale of cruise ships and passenger movement in the main Portuguese ports has grown in recent years to reach 850 calls and 1 219 614 passengers in 2011. For example Lisbon has seen a very strong increase in cruise tourists reaching 600,000 in 2013 creating an important economic stimulus during the economic crisis. The direct and indirect effects for the national economy generated by this activity are important. According to a study by the European Cruise Council, in 2011, Portugal has been the 12th European country to benefit from the

⁷⁶ « Listagem de infraestruturas de acesso ao mar e operadores » – year 2012

⁷⁷ Refer to *Shipbuilding* description for further information

direct impact of the cruise industry: € 195 m. The same study indicates that the cruise industry is responsible for about 7 500 jobs in Portugal, including services crew and ship repair services⁷⁸.

Nevertheless, except for the company Douro Azul, no national operator companies exist but only foreign ones. It is not expected that a national cruise industry will be developed in the mid-term given the important capital investment required, the strong competition from major international players, as well as the trend towards an industry made up of a reduced number of global cruise companies.

Thus, for Portugal the cruise business is mainly on land, with the local economy to benefit from the expenditure incurred by passengers in ports and cities. According to COTEC, for further development of the cruise industry, the country should invest in improving the infrastructures, building passenger terminals and proceed to the establishment of agreements between the port cities visited, its ports, airports and industry hospitality of the region.⁷⁹

Coastal protection

Coastal protection

According to the figures provided in Table 1 (GVA and Employment) related to coastal protection, there is lack of official data on Eurostat and the Statistics Portugal (INE). According to alternative sources⁸⁰ there is a deviation on the employment figure according to the different sources adopted (0.1 thousand people versus 0.5 thousand employees). Regarding the GVA figure, data is only available from one source (Estratégia para o mar), amounting to € 39 100 000⁸¹.

The “Coastal valorisation and protection Plan for Portugal”, with a budget of € 106 m, foresees 173 coastal protection works to be performed until 2015. There are 31 actions classified with the highest priority, out of which 21 refer to coastal defence.

In 2008, the expenditure to protect the Portuguese coastal zones against flooding and erosion amounted to € 11.72 m. Of this amount, 80% is equally divided between the construction and rehabilitation of hard protection structures, such as dikes and breakwaters, and soft measures including dune rehabilitation and beach nourishments. Indirect measures include preparatory studies to define the most appropriate measures as well as technical planning.

Currently in Portugal, the expenditure against flooding and erosion is funded by national expenditure as well as EU funds. Since 1998, the expenditure to protect the Portuguese coasts against flooding and erosion amounted to approximately € 8 m per year.

In Portugal, coastal defense is mainly dealt with at national level. The responsible authority depends on the type of coastal area. The main actors involved are the Ministry for the Sea and Agriculture (MAM), the Port Administrations and the Ministry of Defense. In the autonomous regions of Azores and Madeira, the regional governments have the responsibility of developing plans for their coastal zones.

The Ministry for the Sea and Agriculture (MAM) is responsible for the Public Maritime Domain (PMD), a 50 m coastal strip which is mainly preserved from occupation and in which land cannot be

⁷⁸ European Cruise Council

⁷⁹ Blue Growth for Portugal: a vision of business ocean economy, COTEC, 2012

⁸⁰ Eurostat COFOG, data for 2010; PRC the Economics of Climate change, data for 2008 and the Estratégia Nacional para o mar 2013,2020 (Ref. year 2010)

⁸¹ Directorate-General for Maritime Policy, The Sea Economy in Portugal, December 2012 (document to support the National Ocean Strategy)

turned into private property. As a result, the state is responsible for providing and funding protection if erosion affects an area landward of the PMD zone.

The Port Administrations are responsible for port areas and the Ministry of Defense has responsibility for areas under military administration.

Furthermore, the whole Portuguese continental coastal zone is covered by nine Coastal Zone Management Plans (POOCs) which have all been approved and published. The development of the plans was supervised by the former Water Institute (INAG⁸²) and in protected areas by the former Nature and Biodiversity Conservation Institute⁸³. The APA furthermore implements the coastal defense works and takes care of maintenance. Both institutes are subordinated to the Ministry for the Environment, Spatial Planning and Energy (MAOTE) who ensures all the work included in the "Coastal valorization and protection Plan for Portugal. .

Maritime monitoring and surveillance

Maritime monitoring and surveillance includes the traceability and security of goods supply chains, prevention and protection against illegal movement of people and goods, and environmental monitoring. As this sector is not directly registered hard data are hard to find. As activities are closely intertwined maritime surveillance and monitoring activities are not always easy to distinguish from one another.

In the area of maritime monitoring and surveillance in Portugal, several public authorities are involved according to their statutory competences, namely the National Maritime Authority (AMN), coordinating the Navy, the Directorate-General for the Maritime Authority (DGAM) and the Maritime Police (PM), the Portuguese Air Force (POAF), the Directorate-General for Natural Resources, Maritime Safety and Services (DGRM), the Portuguese Institute for Sea and Atmosphere (IPMA), the Portuguese Hydrographic Institute (IH), the Food and Economic Security Authority (ASAE), the Aliens and Borders Service (SEF), the International Security System (SSI), the Institute for Nature Conservation and Forests (ICNF), the National Health Authority (NHA), Portuguese Environment Agency (APA), Public Security Police (PSP), the Civil Protection National Authority (ANPC), the Judiciary Police (PJ), the Customs and Taxes Authority (AT) and the National Republican Guard (GNR).

Regarding *environmental monitoring* the definition of monitoring programmes are being developed in accordance with the MSFD, which is coordinated by DGRM. Nevertheless several important monitoring systems are in place including: Plano Mar Limpo, Monizee, Monicap, Sificap, Sivic, Monitoring program for the bathing waters; Monizec - monitoring program for the Nature 2000 MPAs network of the Azores; and the POPA - fisheries observation program.

Portugal is being very active in the field of maritime surveillance and monitoring and participated (among other things by Portuguese universities and Research Institutes) in several international projects such as BlueMassMed (BMM) aimed at the integration of maritime monitoring and surveillance, through the exchange of information between different agencies of the Member States participating in the project, in particular with regard to border control and customs, fisheries and marine pollution from ships and ports, the prevention and suppression of illicit activities and the safety of navigation and protection of human life and property. Other projects are Cooperation Project (CoopP) and M @ RBIs - Information System for Marine Biodiversity –having as a main

⁸² Since March 2012 INAG was integrated in the Portuguese Environment Agency (APA), by DL n° 56/2012

⁸³ Since June 2012 ICNB changed designation to Institute for Nature Conservation and Forests (ICNF)

goals the provision of necessary information to fulfil the Portuguese commitments under the extension of the Natura 2000 network to the marine environment. At a national level the NIPIM@R project is being developed to share information on several ocean monitoring systems in a single platform.

There are several bureaucratic and administrative barriers that hamper Portugal's maritime in the field of surveillance and monitoring. In correlation with the need for increased monitoring of fishery resources and other marine biodiversity components and pressures, including through awareness research, the need arises to pursue the efforts to consolidate the network of marine protected areas (MPAs) in Portugal and to expand the Network Natura 2000 towards the marine environment.

2.2. Breakdown of maritime economic activities at regional level (NUTS 1 or NUTS 2)

This section allocates the data from Table 2.1 to maritime regions in the country. The results of this analysis are intended 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).

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)
Portugal	Continental Portugal (except for Açores and Madeira) ⁸⁴	Norte	Atlantic Arc
		Algarve	Atlantic Arc
		Centro	Atlantic Arc
		Lisboa	Atlantic Arc
		Alentejo	Atlantic Arc
	Acores and Madeira ⁸⁵	Região Autónoma dos Açores	Atlantic Arc
		Região Autónoma da Madeira	Atlantic Arc

Table 3.1 presents the percentage share of each region 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 in footnotes to the table.

Table 2.3 Overview of employment and GVA per maritime economic activity per region in Portugal

Sea-basin		Atlantic Arc							Qualitative description of the split
Regional percentages apply on Employment and GVA data	Norte	Centro	Lisboa	Alentejo	Algarve	Região Autónoma dos Açores	Região Autónoma da Madeira		
0.	Shipbuilding								
0.a	Shipbuilding and repair ⁸⁶	20%	10%	66%	0%	3%	1%	0%	

⁸⁴ Formally not a NUTS 1 classification. Figures refer back to the NUTS 1 figure for Portugal minus the figures for Açores and Madeira.

⁸⁵ This is formally not a NUTS 1 classification but is done to distinguish the island regions from the continent of Portugal. It needs to be build up from two NUTS 2 regions.

Sea-basin		Atlantic Arc							Qualitative description of the split
Regional percentages apply on Employment and GVA data	Norte	Centro	Lisboa	Alentejo	Algarve	Região Autónoma dos Açores	Região Autónoma da Madeira		
0.b	Construction of water projects ⁸⁷	23%	0%	77%	0%	0%	0%	0%	
1.	Maritime transport and shipbuilding								
1.a	Deep-sea shipping ⁸⁸	12%	11%	54%	16%	0%	7%	0%	
1.b	Short-sea shipping								
1.c	Passenger ferry services ⁸⁹	0%	n/a	4%	n/a	n/a	55%	41%	
1.d	Inland waterway transport	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2.	Fishing								
2.a	Fisheries for human consumption ⁹⁰	22%	28%	13%	6%	16%	11%	3%	
2.b	Fisheries for animal feeding								
2.c	Marine aquaculture ⁹¹	0%	42%	2%	2%	53%	0%	1%	Referring to aquaculture in marine and brackish waters
2.d	Blue biotechnology	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No data available. Scientific surveys are taking place in southeast waters
2.e	Agriculture on saline soils								
3.	Energy and seabed materials								
3.a	Offshore oil and gas	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3.b	Offshore wind	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No data available. Windfloat project currently underway in Aguçadoura (Norte)
3.c	Ocean renewable energy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No data available. Important project in Aguçadoura (Norte), S. Pedro do Muel (Centro) and in the Azores
3.d	Carbon capture and storage	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3.e	Mining (sand, gravel, etc.)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No data available. Detected in the Atlantic northeast seamounts, a number of areas potentially rich in geological mineral resources
3.f	Marine minerals mining	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
3.g	Desalination	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No data available. Two desalination plants are operating in Algarve
4.	Leisure and tourism								
4.a	Coastal tourism	12%	10%	22%	3%	35%	3%	15%	

⁸⁶ Regional data on shipbuilding has been extracted from the Statistics Portugal (INE), corresponding to CAE (NACE) 33.15 Repair and maintenance of ships and boats and 30.11 Building of ships and floating structures

⁸⁷ Regional data has been extracted from Statistics Portugal (INE) corresponding to CAE (NACE) 42.91 Construction of water projects

⁸⁸ Regional Deep-sea and short-sea shipping data has been estimated based on the number and turnover of Port Operators established in each region

⁸⁹ Regional Passenger Ferry Services data has been estimated based on the Volume of passengers transported by ferry services in each port

⁹⁰ Regional data for Catching fish for human consumption and for animal fishing has been estimated based on the percentage of fish landed per region

⁹¹ Based on Fishing statistics Report 2012 (Estatísticas da Pesca) – Statistics Portugal (INE), p72 Aguas salobras e maranhas. Percentage share of value of production 2011.

Sea-basin		Atlantic Arc							Qualitative description of the split
Regional percentages apply on Employment and GVA data	Norte	Centro	Lisboa	Alentejo	Algarve	Região Autónoma dos Açores	Região Autónoma da Madeira		
	(accommodation) ⁹²								
4.b	Yachting and marinas ⁹³	9%	13%	21%	3%	31%	10%	13%	
4.c	Cruise tourism ⁹⁴	6%	0%	40%	0%	1%	8%	45%	
5. Coastal protection									
5.a	Coastal protection	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6. Maritime monitoring and surveillance									
6.a / 6.b	Maritime surveillance	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6.c	environmental monitoring	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

⁹² Regional Coastal tourism data has been estimated based on the number of nights spent in touristic accommodation establishments

⁹³ Regional yachting and marina data has been estimated based on the regional distribution of berths

⁹⁴ Regional Cruise Tourism data has been estimated based on the number of passengers in the different ports. This percentage has been applied over the average employment and GVA data in Table 1

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 experts and the country expert.

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 Portugal at country level

Rank	Maritime economic activities	GVA (mln €)	Employment	Score
1.	Fisheries for human consumption	834	47 050	27.70
2.	Coastal tourism (accommodation)	955	44 155	26.85
3.	Agriculture on saline soils	120	24 604	12.90
4.	Short-sea shipping	190	2 739	2.32
5.	Shipbuilding and repair	83	3 472	2.15
6.	Deep-sea shipping	122	1 758	1.49
7.	Construction of water projects	84	1 520	1.18

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

This section identifies and selects the 7 fastest growing maritime economic activities as emerged over the past 3 years. 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 a Portugal

Rank	Maritime economic activities	Growth 2008-2010 (CAGR)	Growth 2000-2012 (CAGR)
1.	Construction of water projects	17.1%	n/a
2.	Short-sea shipping	0.3%	1.2%
3.	Deep-sea shipping	-4.0%	2.7%
4.	Passenger ferry services	-4.1%	1.9%
5.	Coastal tourism	-5.0%	0.5%

6.	Shipbuilding	-25%	n/a
7.	Fishing for human consumption	n/a	-0.2%

Not for all maritime economic activities, CAGR figures could be derived.

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 country⁹⁵. The following two indicator sets are included⁹⁶:

Indicator	Explanation	Source
Technological innovation		
1. Scientific publications	Number of scientific publications in a MAE in a Member State in relation to the GVA (€ m) of that maritime economic activity ⁹⁷ .	Thomson Reuters (2011) ⁹⁸
2. Patents	Number of patents in a MAE in a Member State in relation to the GVA (€ m) of that maritime economic activity.	Thomson Reuters (2011)
R&D expenditure		
3. R&D expenditure/GVA	R&D expenditure as a percentage of value added ⁹⁹ (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 national study has been identified that contain information on innovation potential per sector/maritime economic activity. A qualitative assessment of this report is provided beneath.

Table 3.3 Identified national sources on maritime innovation

Source	Qualitative assessment regarding innovation potential per maritime economic activity/sector
"Blue growth for Portugal. Uma visão empresarial da economia do mar"	General assessment to all maritime activities: the reduced innovation is one of the major shortcomings of the Portuguese maritime economy and without it; it cannot be competitive on a global scale. There is potential in terms of act on scientific knowledge that ends up in innovation, being at the service of the economy itself.
	Maritime enterprises (enterprises operating in the marine sector): there are barriers and constraints to maritime enterprises competitiveness in Portugal, due to the deficient functioning and lack of dynamism and innovation in the sector, as well as due to the

95 European Union, 2013: Measuring innovation output in Europe: towards a new indicator. COM(2013)624 final

96 Dependent on data availability

97 For small economic activities a default value of € 1 million has been used. The analysis was performed for 10 MEAs.

98 Analysis carried out in 2011 by Ecorys in the context of the general Blue Growth study. The analysis is based on Thomson Reuters data.

99 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.

opaque action of the State, that has not incentivized the sector. Those barriers can be overcome and there is potential for innovation in this sector. Moreover, and as it will be shown in the following section, Portugal is developing important strategies devoted to enhance the national sectorial clusters, which will improve the added value of the maritime activity sectors value chain.
Renewable offshore energies in Portugal: It is an innovation-intensive industry. However, there is still a lack of skills and sufficient experience in the development of industrial technological innovation processes. Nevertheless, there are some good examples of innovation in this sector, as the adaptation of shipyards to build compounds for offshore renewable industries.
Shipbuilding and ship repair: there is a need for investing in innovation in these activities (high potential of innovation).
Catching fish both for animal and human consumption: there is a need in Portugal to invest in fresh fish conservation to avoid fish damage.
Maritime transport: within the general context of the maritime economy in general and maritime transport in particular, innovation is a factor of development particularly present in the ports sector.
Aquaculture: Existence of a large number of small family businesses with weak management capacity, innovation and introduction of new technologies. One challenge is introducing innovation and diversification in aquaculture production, including innovation in the product. There is also a need for innovation in aquaculture to overcome fishery restrictions imposed by the EU and the reduction in fishery resources. Links between innovation and the strengthening of sustainable fishing capture methods.
Leisure: There is a general need to invest in innovation in this sector. It should be established a certification mechanism of activities, in order to improve the quality of the offer available.
There is a need in Portugal for developing R&D projects in different maritime economic activities such as: fishery and aquaculture and technologies to explore renewable offshore energies.

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/GVA (2008)	R&D/turnover	Composite score ^d	Competitiveness	Employment	Policy relevance	Spill-over effects	Sustainability
0. Shipbuilding										
Shipbuilding	n/a	n/a	2.7%	n/a	●●●	0	0	+	+	0
Construction of water projects	n/a	n/a	n/a	n/a	●●	0	+	0	+	0
1. Maritime transport										
Deep-sea shipping	n/a	n/a	0.4% ^a	n/a	●	-	0	+	+	+
Short-sea shipping	n/a	n/a	0.4% ^a	n/a	●	-	0	+	+	+
Passenger ferry services	n/a	n/a	0.4% ^a	n/a	●	0	0	+	+	+

Maritime economic activity	Innovation Indicators					Other indicators				
	Publication/GVA	Patents/GVA	R&D/GVA (2008)	R&D/turnover	Composite score ^d	Competitiveness	Employment	Policy relevance	Spill-over effects	Sustainability
Inland waterway transport	n/a	n/a	n/a	n/a	●	0	0	0	0	+
2. Food, nutrition and health										
Fisheries for human consumption	n/a	n/a	0.2% ^b	n/a	●	-	-	+	+	-
Fisheries for animal feeding	n/a	n/a	0.2% ^b	n/a	●	-	-	+	0	-
Marine aquaculture	18.6	0.8	n/a	n/a	●	0	+	+	0	0
Blue Biotechnology	101	n/a	n/a	n/a	●●●●	+	+	+	+	+
Agriculture on saline soils	n/a	n/a	0.2% ^b	n/a	●	-	+	+	0	0
3. Energy and seabed materials										
Offshore oil and gas	35	n/a	n/a	n/a	●●●	+	+	+	+	-
Offshore wind	22	3.0	n/a	n/a	●●●	+	+	+	+	+
Ocean renewable energy	76	5	n/a	n/a	●●●●	+	+	+	+	+
Carbon capture and storage	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Aggregates mining (sand, gravel, etc.)	n/a	n/a	n/a	n/a	●	n/a	n/a	n/a	n/a	n/a
Marine minerals mining	30	n/a	n/a	n/a	●●●	+	+	+	+	-
Desalination	3	3	n/a	n/a	●	0	0	-	+	-
4. Leisure and tourism										
Coastal tourism (accommodation)	n/a	n/a	0% ^c	n/a	●	-	+	+	+	+
Yachting and marinas	n/a	n/a	n/a	n/a	●●	-	+	+	+	+
Cruise tourism	n/a	n/a	n/a	n/a	●●	-	+	+	+	+
5. Coastal protection										
Coastal protection	0.6	0.5	n/a	n/a	●	-	-	+	0	+
6. Maritime monitoring & surveillance										
Maritime surveillance	11	n/a	n/a	n/a	●●	-	0	+	0	0
Environmental monitoring	78	n/a	n/a	n/a	●●●●	-	0	+	0	0

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

Based on the above indicator score 7 promising activities have been identified. This selection is primarily based on the composite innovation score, followed by the rank on the other indicators.¹⁰⁰

Table 3.5 The 7 promising maritime economic activities

Rank	Most innovative maritime economic activities
1.	Blue Biotechnology
2.	Ocean renewable energy
3.	Environmental monitoring
4.	Offshore wind

¹⁰⁰ The overall rank for the other indicators has been established by adding the + and deducting the -.

Rank	Most innovative maritime economic activities
5.	Marine mineral mining
6.	Offshore oil & gas
7.	Shipbuilding

4. Identification and analysis of maritime clusters

This section identifies the key Blue Growth clusters in Portugal 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)¹⁰¹.”

4.1. Maritime clusters in Portugal

Building on the clusters already identified in the Blue growth study¹⁰² and complemented with cluster identified in the EU Cluster Observatory¹⁰³, the following clusters have been identified for Portugal.

Table 4.1 Maritime clusters in Portugal¹⁰⁴

Longlist of maritime clusters EU Cluster Observatory	Suggested clusters for in-depth analysis		
	Cluster	Location of the cluster	Maritime economic activities in the cluster
Centro	Aveiro	Atlantic Arc	Industrial fisheries, aquaculture, fish processing; nautical tourism; R&D
Norte	Porto	Atlantic Arc	deep and short-sea shipping; coastal, nautical and cruise tourism; marine minerals mining; fish processing; robotics; R&D
	Leixões	Atlantic Arc	
	Viana do Castelo	Atlantic Arc	deep and short-sea shipping; coastal, nautical and cruise tourism; marine minerals mining; fish processing; robotics; R&D
Lisboa	Lisbon	Atlantic Arc	Shipbuilding & repair, nautical tourism; (industrial) fisheries, marine biotechnology, metallic and non-metallic minerals, freight transport, marine aquaculture, offshore wind farms; cruise tourism; research institutes & universities
Alentejo	Sines	Atlantic Arc	Deep sea and short sea shipping; (industrial)

¹⁰¹ Prof. Michael E. Porter, 20120213, MOC2012 (HBS course) Session 5 - final

¹⁰² In the previous Blue Growth study, these were: Bretagne, Brest, Marseilles, ES: Galician Coast, Barcelona;

¹⁰³ The EU Cluster Observatory denotes maritime clusters and tourism clusters.

¹⁰⁴ 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
			fisheries; aquaculture; marine biotechnology; cruise tourism; chemical & refinery; R&D; maritime security & defense
Algarve	Algarve	Atlantic Arc	(coastal/nautical and cruise) tourism; transshipment; (industrial) fisheries; aquaculture and marine biotechnology
Açores	Açores	Atlantic Arc	Aquaculture; R&D
Madeira	Madeira	Atlantic Arc	Nautical tourism; cruise tourism; fisheries; R&D

Shortlist of maritime clusters in Portugal for in-depth analysis¹⁰⁵

The cluster analysis builds further on the regional allocation of economic activities as described under section 1.2. 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.

- Porto;
- Lisbon.

4.2. Cluster analysis

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

1. 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);
2. 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

Maritime economic activities concerned	Unemployment rate at cluster level ¹⁰⁶ (NUTS III or II level)	Ongoing research: main research institutes / companies associated to the clusters
Porto		<ul style="list-style-type: none"> • Universidade Católica do Porto / Escola Superior de Biotecnologia / Centro de Incubação e Desenvolvimento de Empresas de Biotecnologia • Centro Interdisciplinar de Investigação Marinha e Ambiental – Universidade do Porto

¹⁰⁵ 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.

¹⁰⁶ 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.

Maritime	Unemployment rate	Ongoing research: main research institutes / companies
		<ul style="list-style-type: none"> • Instituto de Engenharia Mecânica e Gestão Industrial, com sede no Porto • Faculdade de Engenharia da Universidade do Porto / Instituto de Engenharia de Sistemas e Computadores • Laboratório de Sistemas e Tecnologia Subaquática • Faculdade de Engenharia do Porto • Instituto de Engenharia de Sistemas e Computadores do Porto • Pólo do Mar do Parque de Ciência e Tecnologias da Universidade do Porto (UPTEC MAR) • Instituto Superior Técnico do Porto • Faculdade de Ciências da Universidade do Porto • Instituto Abel Salazar da UP
Lisbon		<ul style="list-style-type: none"> • Centro de Estudos do Mar - Universidade Autónoma de Lisboa • Centro de Oceanografia (CO), • Universidade de Lisboa • ISR-Lisboa • Iniversidade Nova • Instituto Superior Técnico • Universidade Católica de Lisboa • ISCTE Business School • IPMA • IH • Escola Naval • CINAV • WAVEC • Pavilhão do Conhecimento

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
Porto	n/a	n/a
Lisbon	n/a	n/a

Table 4.4 List and strengths and weaknesses of clusters

Maritime economic activities concerned	Status	Strengths	Weaknesses
Porto Deep and short-sea shipping	Mature	<p><u>Portugal</u></p> <ul style="list-style-type: none"> • Portugal ports are located right on the major north-south and east-west shipping routes, are part of the TENT-T Priority Projects and MOS initiative • Favourable natural conditions (deep water, low tidal amplitude, short-channel access, and climate) • Ports are a priority for the Government (expected high amounts of investment within the Strategic plan for transport. Sustainable mobility) • Public-private management of ports ("landlord" model) has improved their capacity 	<ul style="list-style-type: none"> • Benefits coming from the main European transport initiatives (Motorways of the Sea, TEN-T projects and short sea shipping networks) not yet been fully exploited • Decline of the national maritime transport companies operating mainly in coastal traffic and insular maritime transport • Fierce competition in international shipping • Lack of large tonnage ships

Maritime economic activities concerned	Status	Strengths	Weaknesses
		<p>and productivity and has attracted important investments.</p> <p><u>Porto</u></p> <ul style="list-style-type: none"> • Porto Metropolitan Area is a regional strong hinterland in terms of industry and commerce • Porto da Rede Core, on the field of RTE-T • Port of Leixões ranks the second port in the country (24% of all goods loaded and discharged in mainland Portugal) • The port has focused on a strategy of integration of port services and internationalization • Port of Leixões has implemented 2 Port single window initiatives: “portaria única” (unique guesthouse), that allows trucks remain in the port only 50 minutes, and “siga contentor” (follow the container), that allows to know at any time where each container is located 	
Coastal, nautical and cruise tourism	Slight growth	<ul style="list-style-type: none"> • Significant potential of growing in the short term • Strategic sector for the Government (2 out of 19 strategic products identified in the National Tourism Plan committed the country are related to maritime tourism) • Major sector within the blue economy (39% of the GVA and 48% of the employment) • Important business opportunities related to surfing and world class nautical events 	<ul style="list-style-type: none"> • Tourism industry is still underdeveloped, in particular when compared with other European coastal countries. • Coastal tourism is not an strategic niche to be developed in Porto but rather in the Algarve
Marine minerals mining	Early development	<ul style="list-style-type: none"> • Potential of geological mineral resources present on the Portuguese continental shelf • The Marine Geology Unit within the National Laboratory for Engineering and Geology studies the marine geological resources and their economic potential and performs mapping of the continental shelf and coastal areas • Mineralogical prospecting campaigns are been undertaken and have 	<ul style="list-style-type: none"> • Quite small sector • The exploration effort is not sufficient • The economic activity resulting from the exploitation of mineral resources is almost nonexistent

Maritime economic activities concerned		Status	Strengths	Weaknesses
			detected seamounts with a number of areas potentially rich in ferromanganese and phosphates	
Lisboa	Fishery	Mature	<u>Portugal</u> <ul style="list-style-type: none"> Portuguese coastal waters are rich in terms of variety and quality of fish stocks Fishery is a traditional industry in Portugal High fish demand: Portugal is the largest consumer of fish in the EU and the third in the world <u>Lisbon</u> <ul style="list-style-type: none"> The majority of the vessels are registered in the region (19,7%) Lisbon Region concentrates 12,7% of fish landing Most fish processing industries are located in Lisbon 	<ul style="list-style-type: none"> Restrictive fishing quotas imposed by the EU Relative scarcity of fish stocks Fragmented structure composed of SMEs and small vessels with weak capacities in terms of management, innovation and new technologies Labour force: higher age groups with lower levels of formal education Low productivity Artisanal fishing continues to be the most prevalent "business model" Negative trade balance Drop in the average price of fish landed
	Marine biotechnology	Early development	<p>Main strengths are strengths that are relevant at a national level, including:</p> <ul style="list-style-type: none"> Existence of a vast ultra-deep geographical area still largely unexplored Expected growth rate of 5% per year Some companies are already operating and well positioned, a significant number of them being located in Lisbon Existence of a large number of scientific sea research centres, among which the Institute of Experimental and Technological Biology (IBET) 	<ul style="list-style-type: none"> The sector is still poorly developed
	Freight transport	Mature	<u>Portugal</u> <ul style="list-style-type: none"> Portugal ports are located right on the major north-south and east-west shipping routes, are part of the TENT-T Priority Projects and MOS initiative Favourable natural conditions (deep water, low tidal amplitude, short-channel access, and climate) Ports are a priority for the Government (expected high amounts of investment within the Strategic plan for 	<ul style="list-style-type: none"> Benefits coming from the main European transport initiatives (Motorways of the Sea, TEN-T projects and short sea shipping networks) not yet been fully exploited Decline of the national maritime transport companies operating mainly in coastal traffic and insular maritime transport Fierce competition in international shipping Lack of large tonnage ships

Maritime economic activities concerned		Status	Strengths	Weaknesses
			transport. Sustainable mobility) <ul style="list-style-type: none"> Public-private management of ports ("landlord" model) has improved their capacity and productivity and has attracted important investments <u>Lisbon</u> <ul style="list-style-type: none"> The Port of Lisbon ranks the third port in the country (18% of all goods loaded and discharged in mainland Portugal) The hinterland of the Port of Lisbon covers not only the metropolitan area but also part of the Andalusia region (Spain) 	
	Cruise tourism	Growing	<ul style="list-style-type: none"> Saturation of traditional routes and destinations in the Mediterranean and the Baltic Sea constitutes an opportunity for Portugal cruise ships and passenger movement in the main Portuguese ports has grown in recent years Portugal has been the 12th European country to benefit from the direct impact of the cruise industry Lisbon is one of the main touristic destinations in Portugal Lisbon Port is the main port in the country in terms of cruise passengers 	<ul style="list-style-type: none"> Mediterranean ports are still a fierce competence for Portugal The industry is based on foreign operators calling at Portuguese ports

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
Economic Sea Hypercluster (Hypercluster da Economia do Mar) Business Forum for the Economy of the Sea (Forum Empresarial da Economia do Mar)	The study "Economic Sea Hypercluster" is a political economy study which identifies 12 strategic components of the sea economy (Marine Visibility, Communication, Image and Culture; Recreational Boating and Nautical Tourism; Maritime Transport, Ports & Logistics; Ship Construction and Repair; Fishing, Aquaculture and Seafood Industry; Energy, Minerals and Biotechnology; Marine Works; Marine Services; Production of Strategic Thinking; Environment and Nature Conservation; Defence and Security in the Sea; Scientific Research, Development and Innovation, Education and Training). This study set the goal of doubling the GDP resulting directly from the ocean economy, from the current 4-5% to 10-12%. One of the proposals of the study was the establishment of a Business Forum for the Economy of the Sea, gathering the main actors and mainly those companies interested in different activities

	of the Hypercluster and in contributing to the attainment of the objectives of the study.
OCEANO XXI – Association of the Marine Knowledge and Economy (Associação para o Conhecimento e Economia do Mar)	<p>This association is a collective efficiency strategy recognized by the Compete Program in 2009. It aims to make the most of the SEA resource by developing a set of activities, products and services that promote economic growth, employment and internationalization of the region, focusing on strengthening R&D&I, training, entrepreneurship and cooperation in order to contribute to a sustainable competitiveness of the region. Oceano XXI has a strong partnership within the knowledge field enriched by the participation of a diverse set of companies, business associations and association of municipalities all over the country covering the different areas of activity of the maritime economy.</p> <p>In this framework, OCEANO XXI has set five priority lines that guide its actions in the short and medium term:</p> <p>Priority 1 – To develop Research, Technological Development, Innovation and Training directed to the modernisation of traditional activities and the development of emerging activities in the field of maritime economy and its sustainability;</p> <p>Priority 2 – To improving the quality and value of fishery products, aquaculture and salt production, as well as health food;</p> <p>Priority 3 – To promote the modernisation and innovation of maritime industries, port activities and logistics;</p> <p>Priority 4 – To develop recreational boating and nautical tourism and enhance the material and immaterial maritime heritage;</p> <p>Priority 5 – To promote the internationalisation of activities, enterprises and institutions of the Economy of the Sea. Oceano XXI is strongly involved in several international projects in partnership with other maritime clusters under FP7 and the Atlantic Cooperation programs.</p>
Lisboa Capital Europeia do Atlantico ¹⁰⁷	<p>Lisbon being the capital of Portugal has a significant position in the country. The Lisbon European Atlantic Capital programme intends to strengthen its position as Atlantic Capital as part of the wider Lx-Europa 2020 strategy which should be seen in light of the wider Europe 2020 strategy for the 2014-2020 European Commission programming period. This programme is following a number of main avenues¹⁰⁸:</p> <ul style="list-style-type: none"> • Strengthen relation between the EU and Portuguese speaking countries • Develop an Atlantic logistic platform • Explore the maritime resources and potential • Develop nautical activities • Make use of the unique characteristics and inheritance of Lisbon.

¹⁰⁷ <http://www.clusterdomar.com/index.php/temas/tema-central/152-afirmar-lisboa-como-capital-europeia-do-atlantico>

¹⁰⁸ See Lx-Europe 2020 Lisboa no quadro do proximo periodo de programacao comunitario, November 2012.

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

In the framework of the Marine Strategy Framework Directive¹⁰⁹ the Portuguese General Directorate of Natural Resources, Security and Maritime Services has already prepared the Marine Strategy for the subdivision of the Continent and for the Extended Continental Shelf.

In parallel, Portugal has developed the **National Maritime Strategy 2013-2020**, an instrument of public policy that set the Portuguese vision to long-term sustainable blue growth. The strategy has been developed at a national level, by the DG *de Política do Mar* together with the competent regional bodies. Other relevant public and private stakeholders as well as the civil society have been also involved through a process of public discussion.

This strategy is complemented with specific sectorial strategies listed in the table below. Moreover, the Government is preparing the following strategies

- National Strategic Plan for Fisheries 2014-2020;
- National Strategic Plan for Fishing Ports 2014-2020;
- National Strategic Plan for Aquaculture 2014-2020.

Moreover, the "Report for sustainable growth - a post-troika vision" presented in December 2012 by the Platform for Sustainable Growth, defends five strategic orientations that should be assumed in order to consolidate sea related activities as a driving force for economic development in Portugal: reorganize, restructure and regulate ocean's economy, create a distinctive brand anchored in the approach of the Portuguese sea; enhance knowledge, science and technology and skills in the area of the sea; establish a new financing and governance of the sea model, and protect the oceans against the consequences of climate change

¹⁰⁹ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)

Table 5.1 Assessment of maritime and generic policies

Policy	Objectives	Priorities	Consequences for maritime activities and impacts on sustainable growth	Investment and funding
National Ocean Strategy 2013-2020 (<i>Estratégia Nacional para o Mar 2013-2020</i>)	<ol style="list-style-type: none"> 1. Recover a national maritime identity 2. Foster the economic, geostrategic and geopolitical potential 3. Create conditions to attract domestic and international investment in all sectors of the maritime economy to promote growth, employment, social cohesion and territorial integrity, and reaching, by 2020, a 50% of direct contribution of the maritime sector to the national GDP 4. Strengthen scientific and technological activities to increase the "knowledge of the sea" and to promote an efficient and sustainable use of resources 5. Enhance the role of Portugal within the European IPM, in particular for the Atlantic Area 	<p><u>Natural resources:</u> Ocean, Atmosphere and Integrated System</p> <p><u>Governance:</u> Administration, Strategic thinking</p> <p>Education, science and technology, Communication and culture and protection and safeguarding</p> <p><u>Non-living natural resources:</u> marine mineral resources and marine energy resources</p> <p><u>Living natural resources:</u> fishing and seafood industry, aquaculture and blue biotechnology</p> <p><u>Other activities:</u> ports, transports and logistics</p> <p>leisure, sports and tourism, shipbuilding and repairing and water projects</p>	<p>Given its integrated approach and its cross cutting nature, the strategy will have an impact to all maritime activities. Although the strategy has not been implemented yet, the following (illustrative) impacts can be foreseen:</p> <ul style="list-style-type: none"> - the development of the onshore and offshore aquiculture will reduce the negative fishing trade deficit - the enhancement of the R&D activities and genetic resources will have develop the blue technology sector - the underwater and its non-living resources exploration will develop a wide range of activities and sectors, from shipping and port infrastructure, environmental monitoring and technology development - the enhancement of the maritime renewable energies will contribute to the decarbonisation of the economy as well as the improvement of the domestic industry - shipbuilding and shipyard sector restructuring will enhance the competitiveness and production of the sector - improving marinas infrastructures and sector internationalization will boost the coastal and maritime tourism 	<p>The total investment has not been designed yet. The plurianual budgets will be determined under the different action plans together with the other stakeholder.</p> <p>In general, it can be said the funding will come from national (from the government and from other relevant maritime-related organisms) and European sources as well as other cooperation financial instruments available. It is also expected to attract private invest, mainly FDI and venture capital funds.</p>
Strategic plan for transport. Sustainable mobility, 2011-2015 (<i>Plano Estratégico dos Transportes. Mobilidade Sustentável 2011-2015</i>)	<ol style="list-style-type: none"> 1. Meet external commitments assumed by Portugal and make the sector financially balanced and affordable for taxpayers 2. Enhance the competitiveness and development of the national economy; 3. Ensure efficient mobility and accessibility for people and goods, promoting social 	<p>Passengers Public transports</p> <p>Road infrastructure</p> <p>Maritime transports and ports</p> <p>Logistics</p> <p>Air transport</p> <p>Governance and regulation</p>	<p>In the field of maritime transport, the Plan foresees a number of important investments in Portuguese ports related to building and enlarging container terminals, construction of Port Logistics Platforms, improvement of the Zones of Logistic Activities and cruises terminals. Those projects will improve the Portuguese ports system and will positively affect the competitiveness in the maritime transport sector as well as the cruise tourism.</p>	<p>Given the scarcity and limited public resources, the Plan encourages the participation of the private sector. As far as the investment in the maritime transports is concerned, the Plan presents investment projects (underway or under study) with a value of € 2,456.85 m to be funded via private, public investment and EU funds.</p>

Policy	Objectives	Priorities	Consequences for maritime activities and impacts on sustainable growth	Investment and funding
	cohesion.			
Coastal valorisation and protection Plan for Portugal (PAPVL) 2012-15 (<i>Plano de Ação de Proteção e Valorização do Litoral 2012-2015</i>)	Define the political and strategic vision to improve and valorise the coastal area in Portugal	Coastal defence and risk areas Studies, management and monitoring Plans and regeneration projects	<p>The main objective of the plan is to protect and improve the Portuguese coastal through an important number of initiatives such as:</p> <ul style="list-style-type: none"> - Interventions to ensure the safety of persons and property; - Maintenance / rehabilitation works of defence / coastal protection; - Monitoring of the evolution of coastal systems - Inventory, mapping and evaluation of resources and sedimentary reserves (sand) on the continental shelf - Plans addressed to risk areas, particularly where there is erosion / retreat of the shoreline - Rehabilitation of degraded urban areas in Domain Hydride - Rehabilitation of degraded natural areas <p>Thus, given the general and strategic approach of the plan, it will improve the physical conditions of the coastal areas having positive consequences to all maritime activities in particular:</p> <ul style="list-style-type: none"> - The improvement in the security (goods and persons) will have an impact on the maritime transport, tourism and ports - The rehabilitation of degraded areas will mainly improve the quality of the tourism - Actions to reduce erosion risks will also - The improvement of the marine environment will improve maritime economic activities such as fishery, fresh water, marine mining, agriculture on saline soils or aquaculture - In general, ensuring and improving access to natural resources marine will also boost technological development (blue biotechnology, energy...) 	<p>The plan include 3030 action with a total cost of € 41 thousand m:</p> <ul style="list-style-type: none"> - Coastal defence and risk areas: 98 actions, € 211 thousand m - Studies, management and monitoring: 23 actions, € 16 thousand m - Plans and regeneration projects: 182 actions, € 189 thousand m

Policy	Objectives	Priorities	Consequences for maritime activities and impacts on sustainable growth	Investment and funding
<p>National Strategic Plan for Tourism 2013-2015 (<i>Plano Estratégico Nacional do Turismo - PENT 2013-2015</i>)</p>	<p>Quantitative targets for 2013 – 2015:</p> <ul style="list-style-type: none"> - Number of night spent: growing by an annual average of 3.1% the main engine for growth and continuing the diversification of demand - Revenues: growing 6.3% over the same period by increasing the average consumption of the tourist in Portugal, only possible with the skills and innovative offer of experiences. 	<p>The Plan puts the focus on the development of 10 touristic products. The ones related with the blue economy are:</p> <ul style="list-style-type: none"> - Add value to the “sun and sea” model, improving resource conditions, equipment, services and surrounding landscape - Develop coastal tourism, mainly recreational boating and surfing 	<p>The following maritime related-activities are foreseen:</p> <ul style="list-style-type: none"> - Enhance environmental quality and accessibility of beaches - Stimulate the add value to “sun and sea” tourism with complementary activities; - Development and revitalization of the Algarve as an excellence sun and sea destination - Accessible tourism - Promote surf beaches - Improvement of the marinas (infrastructures, management) - Stimulate the development of nautical activities - Organize and promote international nautical events and competitions <p>With all those activities, it is expected that the Plan will have positive consequences for coastal tourism.</p>	<p>The budget has not been designated</p>

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 6.1 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	83	3 793	
		National statistics	80	3 472	Combination of national statistics and Eurostat
		Alternative	113	4 400	Estratégia Nacional para o mar 2013,2020 (Ref. year 2010)
0.b	Construction of water projects	Eurostat	84	1 520	
		National statistics	85	1 520	Combination of national statistics and Eurostat
		Alternative	n/a	n/a	
1. Maritime transport					
1.a	Deep-sea shipping	Eurostat	122	1 758	
		National statistics	128	1 821	Combination of national statistics and Eurostat
		Alternative	128	2 700	Estratégia Nacional para o mar 2013,2020 (Ref. year 2010)
1.b	Short-sea shipping	Eurostat	190	2 739	
		National statistics	199	2 836	Combination of national statistics and Eurostat
		Alternative	incl. in 1.1	incl. in 1.1	
1.c	Passenger ferry services	Eurostat	36	698	
		National statistics	16	458	Combination of national statistics and Eurostat
		Alternative	incl. in 1.1	incl. in 1.1	
1.d	Inland waterway transport	Eurostat	0	0	
		National statistics	0	0	Combination of national statistics and Eurostat
		Alternative	n/a	n/a	
2. Food, nutrition and health					
2.a	Fisheries for human consumption	Eurostat	834	47 050	JRC (fishing), Eurostat (fish processing, wholesale & retail), PRODCOM (share of human/animal)
		National statistics	750	40 696	
		Alternative	367	11 300	Estratégia Nacional para o mar 2013,2020 (Ref. year 2010)
2.b	Fisheries for animal consumption	Eurostat	5	281	JRC (fishing), PRODCOM (share of human/animal)
		National statistics	12	751	
		Alternative	n/a	n/a	
2.c	Marine aquaculture	Eurostat	6	2 085	JRC
		National statistics	6	601	JRC
		Alternative	n/a	n/a	
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	120	24 604	
		National statistics	120	24 604	Combination of national statistics and Eurostat
		Alternative	n/a	n/a	

3. Energy and sea bed materials					
3.a	Offshore oil and gas	Eurostat	n/a	n/a	No data on NACE 09.10.
		National statistics	n/a	n/a	
		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	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	0	0	No offshore aggregates mining in Portugal according to UEPG
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	n/a	n/a	
4. Leisure and tourism					
4.a	Coastal tourism (accommodation)	Eurostat	905	44 155	data for 2009
		National statistics	1 024	49 280	Combination of national statistics and Eurostat
		Alternative	1,300	48 800	Estratégia Nacional para o mar 2013,2020 (Ref. year 2010)
4.b	Yachting and marinas	Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	101	3 600	Estratégia Nacional para o mar 2013,2020 (Ref. year 2010)
4.c	Cruise tourism	Eurostat	39	758	
		National statistics	17	497	
		Alternative	170	7 300	European Cruise council
5. Coastal protection					
		Eurostat	n/a	n/a	
		National statistics	n/a	n/a	
		Alternative	6	63	Eurostat COFOG, data for 2010; 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	n/a	n/a	

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 and repair	GVA	Eurostat	2008-2010	-25%	n/a		
0.b	Construction of water projects	GVA	Eurostat	2008-2010	17.1%	n/a		
1. Maritime transport								
1.a	Deep-sea shipping	Volume of deep sea cargo shipped, 1000 tons	Eurostat	2000-2011	-4.0%	2.7%		
1.b	Short-sea shipping	Volume of short sea cargo shipped, 1000 tons	Eurostat	2000-2011	0.3%	1.2%		
1.c	Passenger ferry services	1000PASF - 1000 passengers (excluding cruise passengers)	Eurostat	2000-2011	-4.1%	1.9%		
1.d	Inland waterway transport	1000 tonnes transported on inland waterways	Eurostat	no data	n/a	n/a		
2. Food, nutrition and health								
2.a	Fisheries for human consumption	Volume index of production, Gross data	Eurostat	2000-2007	n/a	-0.2%		
2.b	Fisheries for animal feeding	Volume index of production, Gross data	Eurostat	2000-2007	n/a	-0.2%		
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	no data	n/a	n/a	no production	
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	2000-2007	n/a	-2.2%	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		

Maritime economic activity Indicator		Source	Availability	CAGR (2008-2010)	CAGR (2000-2012)	Notes
4. Leisure & tourism						
4.a	Coastal tourism (accommodation)	Index turnover, Gross data (all accommodation NACE 55)	Eurostat	2000-2012	-5.0%	0.5%
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	no data	n/a	n/a
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