



# Blue Growth in EU sea basins: methodology for data gathering and processing for the North Sea and Atlantic Arc

Annex I to sea basin reports

Client: DG Maritime Affairs and Fisheries

Rotterdam/Brussels,

15 December 2013





# **Blue Growth in EU sea basins: methodology for data gathering and processing for the North Sea and Atlantic Arc**

Annex I to sea basin reports

Client: DG Maritime Affairs and Fisheries

Rotterdam/Brussels, 15 December 2013

# The Consortium Partners



**Consortium leader**  
Economic expertise, highest quality, wide geographical coverage & broad range of services

- One of the oldest and largest economic research and consulting firms in Europe
- International recognition, highest quality & independence – including a Nobel Prize
- Clients range from local governments to the European Commission and international financing institution medium-sized companies to the largest multinationals
- 16 permanent offices in 11 countries, worldwide experience in more than 140 countries including all sea basins
- Extensive project management experience
- Experience with structural and cohesion funds, Interreg, EDF, ERDF, TRD
- Services in the areas of real estate, property and housing, transport, infrastructure, infrastructure finance and investment, logistics, ports and shipping, industry and trade, macroeconomics and public finance, environment and energy, health care, labour and education, regional and urban development, social security, tourism, agriculture and rural development
- Involving skilled staff from offices in the Netherlands, Brussels, the UK and elsewhere. Additionally, introducing training services of the Ecorys Academy



Promoting sustainable use of aquatic resources through sound integrated management policies and practices

- Designing and implementing integrated resource management systems in marine, estuarine, riverine and floodplain environments
- Consideration of the physical, biological, technical, social, economic, and institutional elements of resource utilisation
- Worldwide experience -more than 60 countries including all sea basins
- Clients include government agencies, IFIs, the European Commission in general and the Directorate-General for Maritime Affairs and Fisheries in particular, non-governmental organisations and private sector companies
- Services include: Policy and Strategic Planning, Fisheries Management, Resource Assessment, Institutional Development, Technical Training, Chain of Custody Audits, Conference and Workshop Planning, Performance Monitoring and Evaluation, Data and Information Management, Information Review, Sharing & Co-operation, Monitoring, Control and Surveillance, Preparation work for Fisheries Certification



Environmental, economic and social dimensions of development

- Initiates, prepares, manages and follows-up on transnational projects in the sphere of sustainable development.
- Services include: Development & Application, Management & Communication, Evaluation & Policy Advice
- Recent projects include SUBMARINER, Baltadapt, BaltSeaPlan, PlanCoast, TIDE covering the Baltic, Adriatic, Black Sea and North Sea basins
- Creating international project **partner networks**
- Organising and moderating project development **workshops**
- Reframing client general demands into a clear set of achievable objectives, work packages and activities
- Clients include transnational organizations, ministries, public agencies and institutes, municipalities

Consortium Lead Partner  
ECORYS Nederland BV

P.O. Box 4175  
3006 AD Rotterdam  
The Netherlands

T +31 (0)10 453 88 00  
F +31 (0)10 453 07 68  
E [fwcbluegrowth@ecorys.com](mailto:fwcbluegrowth@ecorys.com)  
Registration no. 24316726

[www.ecorys.com](http://www.ecorys.com)

# Table of contents

1	Introduction: structure of this annex	5
2	Overall methodology	7
	Part A: Eurostat based data approach	13
3	Function 0. General, other sectors	15
3.1	MEA 0.1 Shipbuilding and ship repair	15
3.2	MEA 0.2 Construction of water projects	16
4	Function 1: Maritime transport	19
4.1	MEA 1.1, 1.2, 1.3, 1.4 and 4.3 Deep sea shipping, short sea shipping, Ferry services, inland waterway transport, cruise tourism	19
5	Function 2: Food, aquaculture	25
5.1	MEA 2.1 and 2.2 Catching fish for human and animal consumption	25
5.2	MEA 2.3 Marine aquatic resources	29
5.3	MEA 2.5 Agriculture on Saline soils	30
6	Function 3: Energy & raw materials	33
6.1	MEA 3.1 Oil & gas	33
6.2	MEA 3.5 Aggregates mining	37
7	Function 4: Coastal and maritime tourism	41
7.1	MEA 4.1 Coastal tourism	41
7.2	MEA 4.3 Cruise tourism	46
8	NACE sectors used and their definitions	47
	Part B: national statistics data approach	53
9	National Statistics	54
	Part C: Alternative sources	65
9.1	MEA 2.4 Blue biotechnology	65
9.2	MEA 3.2 Offshore wind	66
9.3	MEA 3.3 Ocean renewable energy sources	67
9.4	MEA 3.4 Carbon Capture and Storage	69
9.5	MEA 3.6 Marine mineral resources	70
9.6	MEA 3.7 Fresh water supply (desalination)	71
9.7	MEA 4.2 Yachting and marinas (maritime tourism)	72
9.8	MEA 5.1 Coastal protection	74
9.9	MEAs 6.1+2 Security of goods and people and 6.3 environmental monitoring	76
	Part D Excel data file	79

Part E Estimating recent growth rates 81

Part F methodology for future potential 84

# 1 Introduction: structure of this annex

## Disclaimer

The current Annex (and the underlying database) is intended to give the reader an overview of the main methodology used. A full consistency check with all country fiches has not yet been performed, as these country fiches are still work in development. As a result alternative approaches used in country fiches or newly introduced common approaches (e.g. regarding growth rates) have not yet been fully aligned. This will be done in the final version of the documents.

In this annex, the methodology to estimate the size and growth of the Blue Economy for the countries in the North Sea Basin and the Atlantic Arc is elaborated<sup>1</sup>. The methodology was developed jointly with the consortium responsible for the Baltic and Mediterranean/Black Sea Basin, as to ensure a harmonised approach across all EU sea basins<sup>2</sup>.

In chapter 2, the overall methodology followed is elaborated step by step. It explains the use of three different sources of data:

- Eurostat data
- Data from national statistical agencies
- Data from alternative sources

It also identifies for which maritime economic activities (MEA), Eurostat and national statistics could be used, and for which not. For the latter, alternative sources were taken to give estimates of the size of these MEA. For the former, where possible, alternative sources were still consulted to the statistical data with other (e.g. industry) estimates of the MEA size.

This Annex is structured in six parts (A to F) that follow the introduction of the overall methodology in the next section. Part A addresses the methodology applied for data taken from Eurostat. For each MEA for which Eurostat data could be used, the detailed methodology is elaborated in specific paragraphs, which follow a standard structure.

The data approach used in assessing national statistics data is given in part B. This method is largely similar to the one followed for Eurostat-based data. Differences found between the two sources are identified.

If for a specific MEA the general methodology using Eurostat or national statistics could not be applied for a specific country, this is reported under that MEA, and an explanation of the alternative approach followed is given.

In **part C**, the data used from alternative sources, especially for MEA not covered by Eurostat or national statistics, are presented. **Part D** of this annex is a separate Excel file in which all data and calculations are given. In **Part E**, the approach for estimating the recent growth of maritime economic activities is addressed. Underlying data are included in part D. As regards the assessment of the future potential of MEAs, the approach is described in **part F**.

<sup>1</sup> Including the countries Norway, Germany, Netherlands, Belgium, UK, Ireland, France, Spain and Portugal. The other countries in the North Sea Basin have been assessed by COGEA following the same overall methodology.:

<sup>2</sup> COGEA consortium





## 2 Overall methodology

### The Blue Growth Study<sup>3</sup>

In the Blue Growth study, six maritime functions were defined, which were further subdivided into 27 sub-functions or **maritime economic activities (MEAs)**. An important aspect in these functions or MEAs is that they have been approached from a value chain perspective (combining several economic sector activities) rather than an individual economic sector. Their size and growth rate was estimated at an EU level starting from centrally published EU wide data, e.g. Eurostat, which ensured coherence between countries and sectors and consistency over time. For non-traditional maritime economic activities and in particular for small and immature sub-functions this turned out to be impossible as these activities are not covered by formal statistics. As a result other sources were needed, as was reflected in the Blue Growth study overview table on sub-functions sizes. However, also for a number of larger and more mature MEAs, like transport, oil and gas, or tourism, assumptions were needed in the Blue Growth study and we used secondary sources which in several cases were from incidental sources. (See annex 1 of the Blue Growth report, September 2012 and the addendum to this of May 2013).

### Elaborating Blue Growth at a Sea Basin and country level

Following the Blue Growth study, the European Commission - DG MARE - commissioned several studies to elaborate the Blue Growth findings at the level of sea basins. Across these studies a methodology had to be developed which should take account of:

- Clear & consistent data use across activities and countries;
- Replicability, e.g. use of data that are regularly (annually) updated and time series can be established;
- Publicly available sources, so that updating of data does not depend on specific study approaches that are not accessible in future;
- Country level data: The objective of DG MARE is to have country specific data. In contrast to the Blue Growth study which provided data at EU level, the analysis now focuses on a Member State (NUTS0) level.

### Data presented

The Blue Economy Tables have been prepared for all relevant countries and for the following indicators:

- a. **Gross value added (GVA)** as defined in the Structural Business Statistics database of Eurostat. For data obtained from alternative sources, deviating definitions may apply and the researchers have aimed to use figures matching the Eurostat definitions as closely as possible;
- b. **Number of persons employed** as defined in the Structural Business Statistics database of Eurostat, or a definition as close to this as possible if alternative sources are used;
- c. **Growth rates of GVA** where possible;
- d. **Growth rates of persons employed** where possible;
- e. **Regionalisation** as to assign activities to sea basins (for countries bordering multiple sea basins, e.g. Germany, UK, France, Spain).

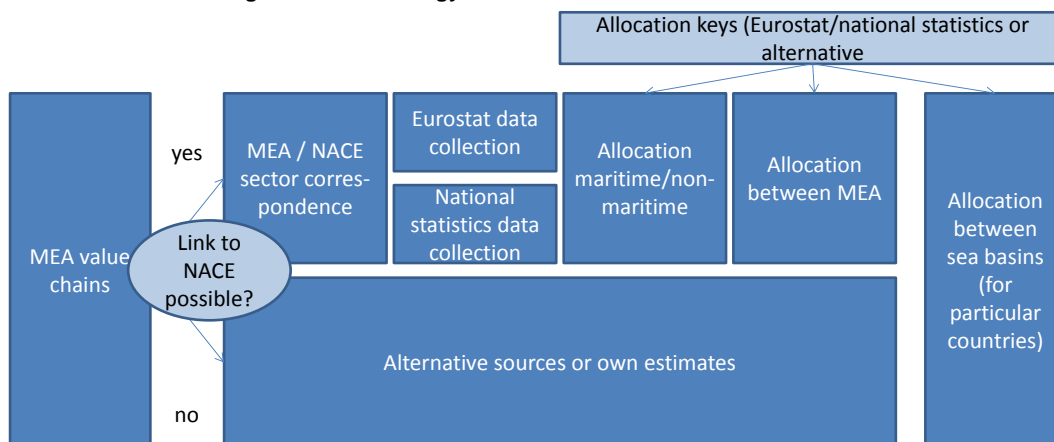
---

<sup>3</sup> Ecorys (2012), Blue Growth. Scenarios and drivers for sustainable growth of oceans, seas and coasts

## General approach

In order to estimate all Maritime Economic Activities (MEA), the following approach was followed:

Figure 2.1 Schematic overview of general methodology



1. **Specification of value chains:** identification of economic sectors relevant to the value chains of the 27 maritime economic activities (MEA) as identified in the 'Blue Growth' study. It is noted that while value chains were defined in the Blue Growth study, these not always directly define economic sectors, but in several cases rather 'processes' or 'phases' of an activity cycle. Linking MEAs to sectors is needed as economic data (Eurostat, national statistics) are based on clearly defined economic sectors. The specification of the value chains builds on the description of the value chains for individual MEAs provided in the 'Blue Growth' study and is complemented as necessary;
2. **Mapping MEAs to NACE codes:** for each MEA a correspondence mapping has been developed between the maritime economic activities and the NACE 2<sup>4</sup> nomenclature of economic sectors. In other words, a list of relevant NACE codes has been identified for each MEA based on the value chains defined under point 1 above.  
For a number of MEA, correspondence to NACE 4-digit NACE sectors is not possible, as the sectors underlying the value chains from point 1 are too small/invisible in NACE 4-digit levels. The below table indicates for which MEAs a direct correlation with Eurostat/NACE data could not be developed. For these MEA, alternative approaches and sources have been applied (see part C of this annex);

Table 2.1 MEA based on NACE 2 sector data(left) versus alternative sources (right)

MEA based on NACE correspondence	MEA estimated using alternative sources
1.1 Deep-sea shipping	2.4 Blue biotechnology
1.2 Short-sea shipping	3.2 Offshore wind
1.3 Passenger ferry services	3.3 Ocean renewable energy sources
1.4 Inland water transport	3.4 Carbon Capture & Storage
2.1 Catching fish for human consumption	3.6 Marine mineral resources
2.2 Catching fish for animal consumption	3.7 Securing fresh water supply (Desalination)
2.3 Marine aquatic resources	4.2 Yachting and marinas
2.5 Agriculture on saline soils	5.1+5.2+5.3 Coastal protection

<sup>4</sup> Wherever possible throughout our work we will use NACE 2 codes to provide the most recent picture and to make the work replicable in the future.

MEA based on NACE correspondence	MEA estimated using alternative sources
3.1 Oil & gas	6.1+6.2 Maritime security
3.5 Aggregates mining	6.3 Environmental monitoring
4.1 Coastal tourism	
4.3 Cruise tourism	

For the 'left side' MEAs, which can be based on NACE 2 sector data, the methodology follows the upper part of figure 1.1. The general methodology used to estimate these MEAs is further elaborated below. For the 'right side' MEAs, tailor made methods were developed for each individual MEA, as indicated by the lower part of figure 1.1. These are presented in the MEA specific sections in part C of this annex.

In this process two economic activities have been separated from the MEAs (as part of a newly added function 0), as they are highly relevant but proved to be very hard to allocate to individual MEAs. These include:

- Shipbuilding and repair
- Construction of water projects

These are presented as separate MEAs in the sea basin studies.

For the 'left side' MEAs, a categorisation of the relevance of NACE sectors is made, using three categories:

- Primary** NACE codes: for which maritime related economic activities account for all (or virtually all) of the value for the given code. This category would include, for example, activities such as building and repair and maintenance of ships and boats (30.11, 30.12, 33.15) or sea and coastal transport (50.10, 50.20) etc;
- Secondary** NACE codes: for which there is clearly a part of the value of the NACE code that is attributable to maritime related economic activities but where there is a significant part that relates to non-maritime activities. This category would include, for example, activities such as cargo handling (52.24) that covers activities related to all cargo transport modes (e.g. including rail, air and road) or extraction of petroleum and natural gas (06.10, 06.20) that covers both offshore and onshore extraction activities;
- Tertiary** NACE codes: for which – based on the overall description of the value chain components of the 27 MEAs (see Point 1) – a part of value for the given code may be attributable to maritime related economic activities. In other words, the definition of the NACE code suggests that it does (or should) cover economic activities that correspond to economic activities within one or more of the 27 MEAs. However, in comparison to 'secondary' NACE codes, the attribution of the relevant part of the overall value of the NACE code to the Blue economy, in general, or to specific MEAs is *a priori* difficult to ascertain. This may arise, for various reasons, such as:
  - Maritime-related activities account for only a very small share of the total value of the NACE code;
  - The maritime component of the NACE code is spread across multiple MEAs, with each corresponding sub-component being difficult to identify;
  - The activity covered by the NACE code is situated at some 'distance' (upstream or downstream) within the relevant value chain(s), hence making it more difficult to apportion the relevant part of the value of the NACE code to maritime activities.

For these reasons, tertiary NACE sectors are described in the value chains but not included in the estimation of the size and growth of the MEAs<sup>5</sup>;

3. **Collection of statistical data** (for the MEA for which this is possible): based on the correspondence mapping developed in the previous step, data at the level of primary and secondary NACE 4-digit sectors is collected from the Eurostat database and at the same time from national statistical databases. As we work with NACE rev.2, usually statistics are given as of year 2008, with the most recent year in Eurostat usually 2010. The same data is also gathered from national statistics, as a check on consistency and also because it was found that sometimes NACE sectors are defined but data is not actually reported (empty tables) either at Eurostat or at national statistical agency side;
4. **Allocation between maritime and non-maritime**: Some NACE sectors can be considered 100% relevant to the maritime economy (e.g. 50.10 sea and coastal passenger water transport), whereas others may combine maritime and non-maritime components (e.g. 06.10 Extraction of crude petroleum covers both onshore and offshore oil extraction). For the latter, an allocation key to split the statistical data between maritime and non-maritime economic activity is needed. To make this, for each NACE sector an allocation key was defined, which will be specific to the NACE sector concerned. Data for these allocation keys were gathered again from Eurostat and from national statistical sources. In some cases these did not provide useful data for specific allocations, hence also use was made of alternative sources or expert estimates;
5. **Allocation between maritime economic activities**: some NACE sectors can be considered 100% relevant to one specific maritime economic activity (primary NACE codes e.g. 06.10 Extraction of crude petroleum relates to MEA 3.1 Oil and gas), whereas other NACE sectors may be relevant to multiple maritime economic activities (secondary NACE codes e.g. 50.10 sea and coastal passenger water transport relates to both 1.3 passenger ferry services and 4.3 cruise tourism). For the latter, an allocation key to split the statistical data between the relevant MEA is defined, specific to the NACE sectors concerned. As for the allocation between maritime and non-maritime, data for these keys was obtained from Eurostat and national statistics where possible, or alternatively from sector specific studies or expert judgments;
6. **Sea basin allocation**: If a country is bordering various sea basins (e.g. Spain, France) an allocation key needs to be developed in order to permit the overall country GVA and employment estimates to be allocated between each sea basin. The allocation keys are established on the basis of Eurostat indicators, data from alternatively available literature, proxy variables or, as a last resort, on expert opinions. This allocation is also made for MEAs that are not based on NACE/Eurostat data but on alternative sources.

The general methodology is further elaborated in detail for each individual MEA in the subsequent chapters. In principle, the methodology followed is applied in the same way for all countries, also for those under study contracts for the Baltic Sea and the Mediterranean and Black Sea. However at the level of individual countries and individual MEA, adjustments were sometimes required either because of a lack of data from the preferred sources or because of more detailed information available to the country editors. Where this is the case, country specific adjustments are explained.

---

<sup>5</sup> Apart from the, already indicated, economic sectors related to Shipbuilding and repair, and Construction of water projects which have been listed as separate economic activities.

It is noted that also for MEAs where statistical data can be found, a search for alternative estimates was made, as a means to cross-check/verify estimates. One particular reason is that for several MEAs the statistical figures, the definition of the value chain on the basis of NACE sectors may differ from the definition used in other sources.. Specific studies may provide estimates using wider definitions and thus given an indication of the upward potential with regard to the MEA's size. These alternative figures are presented in part D (the excel file containing data on all MEAs), alongside Eurostat/national statistical data.

Furthermore it is noted that, in order to be able to calculate growth rates over time, complete data for multiple years is needed. The data collection has shown that Eurostat tables as well as national statistics tables regularly show empty values (no data) for certain years and/or certain NACE sector codes. This means that:

- A total value for a specific MEA cannot be constructed if data for one underlying NACE sector is lacking;
- A value for the latest year cannot be made if for one underlying NACE sector the latest year figure is lacking;
- A correct growth rate cannot be calculated if data for one or more years is lacking.

This problem has been tackled by either ignoring the specific NACE sector (if – as observed from data for other countries, its relative size is small compared to other NACE sectors relevant for the specific MEA), or by taking the figure from the latest available year (if data for a previous year was available for the respective NACE sector). Alternatively other indicators have been used if GVA or employment figures did not provided sufficient basis to assess growth.

Where this is the case for specific MEA and specific countries, this is indicated in the subsequent sections.

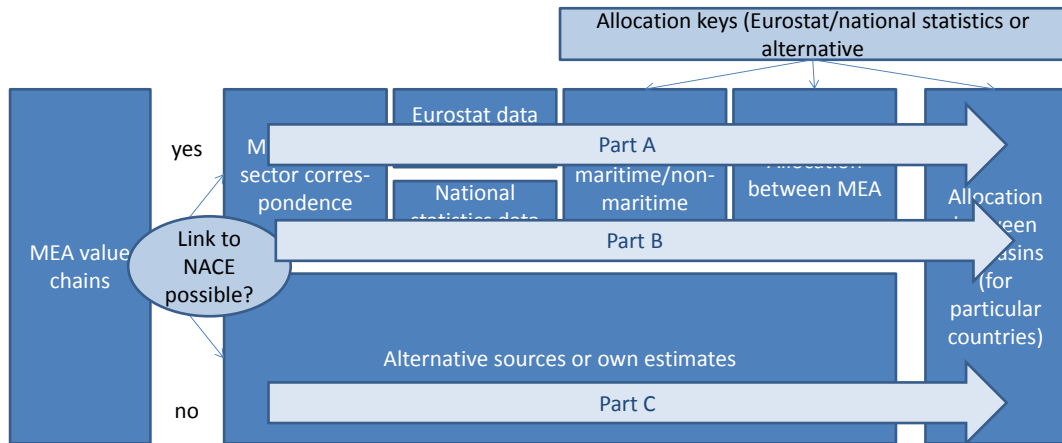
### **Growth rates**

Finally, the growth over time was estimated using time series of data for the respective MEAs. As the above elaboration is largely based on NACE Rev.2 data, the available time series on employment and GVA is limited to 2008-2010, which is considered too short to give a consistent impression of trends, also aware of the fact that an economic crisis may have disrupted trends during this period. Therefore, alternative indicators for which longer term time series could be found are used to estimate the growth over time. In part E of this annex, further elaboration of this is given.

### **Summary – annex structure**

In summary, the methodology developed using (Eurostat) statistical data based on NACE sector allocations is given in part A; for national statistics in part B, and for alternative sources in part C of this annex.

**Figure 2.2** Data & methodology scheme – which part of this annex



## Part A: Eurostat based data approach

As explained in the previous chapter (Overall Methodology), for a number of MEAs a direct correlation with NACE sectors could be established. The approach followed and data used are elaborated in the chapters below. Part A described the MEAs per main function.

Function	MEA
0. General, other sectors	0.1 Shipbuilding
	0.2 Water projects
1. Maritime transport	1.1 Deepsea shipping
	1.2 Shortsea shipping
	1.3 Passenger ferry services
	1.4 Inland water transport
2. Food, aquaculture	2.1 Catching fish for human consumption
	2.2 Catching fish for animal consumption
	2.3 Marine aquatic resources
	2.5 Agriculture on saline soils
3. Energy & raw materials	3.1 Oil & gas
	3.5 Aggregates mining
4. Leisure, tourism	4.1 Coastal tourism
	4.3 Cruise tourism





### 3 Function 0. General, other sectors

Deviating from the Blue growth Study, Shipbuilding & repair and the Construction of Water projects have been including under a new “general” function 0, as they are relevant for many MAEs, and proved to be hard to allocate to individual value chains. In addition these are sizeable economic activities which merits treating them differently to avoid that they become “invisible” because they are spread out thin over a large number of other MEAs.

In the Blue growth study:

- The shipbuilding sector was statistically included under maritime transport, although it is clear that this economic sector supports virtually all maritime economic activities, not just transport (moreover EU shipbuilders are less active in cargo ship construction than their Asian competitors, while they are leading in other types of ships, e.g. offshore vessels, cruise ships, dredgers).
- Water projects were statistically included under the heading of coastal protection, while it appears that projects under this category may also relate to e.g. port construction, offshore energy projects, or other maritime economic activities.

Hence, instead of trying to allocate which parts of these sectors should be attributed to which MEA, a task hardly possible with the limited level of detail of data available, it was decided to introduce a new category “0. Other sectors”, under which two maritime economic activities are defined:

0.1 Shipbuilding and ship repair

0.2 Construction of water projects

#### 3.1 MEA 0.1 Shipbuilding and ship repair

##### Value chain

This MEA was defined as an additional MEA but in fact contains specific sectors rather than a value chain, as these sectors are supportive to other MEAs. Hence no value chain was elaborated.

##### Corresponding NACE sectors

The data for this MEA are based on NACE sectors. The following codes (NACE Rev. 2) are included in the Shipbuilding and Repair MEA:

- 30.11 Building of ships and floating structures;
- 30.12 Building of pleasure and sporting boats<sup>6</sup>;
- 33.15 Repair and maintenance of ships and boats.

NACE rev. 2 “38.31 Dismantling of wrecks” is not included here since it includes all types of wrecks (cars, computers, televisions etc.) and given that dismantling of ships basically takes places outside the EU, its relevant size is considered limited, while a clear allocation to EU countries is hard to make.

---

<sup>6</sup> It is noted that initially this sector was considered part of MEA 4.2 yachting and marinas, as was the case in the Blue Growth study. However it was decided to include it under the heading of shipbuilding as to have the picture complete here.

### Data collection

Eurostat data on GVA and employment for the above-mentioned NACE codes are taken from the following location: [Link](#). Data tables are also included in part D (excel file with all data used as well as calculations and results).

### Allocation maritime/non-maritime

As all NACE sectors included in this MEA are considered to be 100% maritime (including inland water transport), no further allocation is needed. It is noted that this causes an overestimation with regard to the building of pleasure boats, as this category also includes pleasure boats intended for inland waters.

### Allocation to MEAs

Since the shipbuilding NACE sectors have been taken out of the other functions' MEA, the need for allocation has been removed.

### Allocation to sea basins

For the purpose of our analysis, it is needed to split shipbuilding activities by sea basin for Spain, France, Germany, Denmark and UK. As no regional breakdown of the above-mentioned statistics is available, the split is based on country experts' views, building on indicators such as e.g. the number of shipbuilding yards located in the related sea basin.

### Country-specific adjustments

As can be seen from the input tables in part D, for a number of NACE sector/country combinations, data was lacking for one or more sectors for specific countries, either for GVA or employment, or both, so that complete estimates could not be made.

For estimating the size, for Belgium, for NACE sector 30.12, the data for 2009 was taken as no 2010 data was given.

### Resulting figures

See part D (Excel file presenting calculations and resulting data).

## 3.2 MEA 0.2 Construction of water projects

### Value chain

This MEA was defined as an additional MEA but in fact contains one specific sector rather than a value chain, as this sector is supportive to multiple other MEAs. Hence no value chain was elaborated.

### Corresponding NACE sectors

The data for this MEA are based on a single NACE sector:

- 42.91 Construction of water projects.

This sector includes the construction of waterways, harbour and river works, pleasure ports (marinas), dams and dykes. Also activities such as dredging of waterways are included.

### Data collection

Eurostat data on GVA and employment for the above-mentioned NACE codes are taken from the following location: [Link](#).

Data are also included in part D (excel data file including input data, calculations and results).

#### **Allocation maritime/non-maritime**

As the selected NACE sector is considered 100% maritime (including inland waterways related works though), no allocation is needed.

#### **Allocation to MEAs**

Since the selected NACE sectors have been taken out of the other functions' MEA, the need for allocation to other MEAs has been removed.

#### **Allocation to sea basins**

This NACE code is not available at a lower aggregation level in EUROSTAT. For allocating this item to different sea basins, country experts have used their expert judgment, building on e.g. knowledge of coastal erosion, port development and other water works and of maps indicating main activities in this sector.

#### **Country-specific adjustments**

Not applicable.

#### **Resulting figures**

See tables above. Tables are also presented in part D (Excel data file).



## 4 Function 1: Maritime transport

Under function 1, maritime transport, four maritime economic activities are defined for each of which a correlation to NACE sectors and Eurostat data can be made:

- 1.1 Deep sea shipping
- 1.2 Short sea shipping
- 1.3 Passenger ferry services
- 1.4 Inland water transport

The elaboration is made for all four MEAs in combination, as relevant sectors are related to all MEAs, and hence presented here for the four MEA jointly. Results are then presented for each MEA separately in sub-sections.

Furthermore, within this section also the elaboration of MEA 4.3 Cruise tourism is included, as this has close relation to the same statistical data as the maritime transport MEAs addressed.

### 4.1 MEA 1.1, 1.2, 1.3, 1.4 and 4.3 Deep sea shipping, short sea shipping, Ferry services, inland waterway transport, cruise tourism

#### Value chain

For the maritime transport MEAs, two main components of the value chain were identified:

- Water transport services, e.g. the shipping activities itself.
- Port services, e.g. operating terminals, handling cargoes, storage, VAL, port management

Supplier sectors like shipbuilding and maritime works (constructing ports, maintaining access channels) are included under 0.1 and 0.2 as presented in the previous chapter.

#### Corresponding NACE sectors

The below table indicates the NACE sectors identified and their correspondence to the various MEA.

**Table 4.1 NACE sectors and their correspondence to maritime transport MEA**

Value chain	NACE v2 code	NACE sector	1.1 Deep sea shipping	1.2 Short sea shipping	1.3 Passenger ferry services	1.4 Inland water transport	4.3 Cruise tourism
Water transport	50.20	Sea and coastal freight water transport	√	√			
	50.10	Sea and coastal passenger water transport			√		√
	50.40	Inland water transport				√	
	77.34	Renting and leasing of water transport	√	√	√	√	√
Port services	52.22	Service activities incidental to water	√	√	√	√	√

Value chain	NACE v2 code	NACE sector	1.1 Deep sea shipping	1.2 Short sea shipping	1.3 Passenger ferry services	1.4 Inland water transport	4.3 Cruise tourism
		transportation					
	52.24	Cargo handling	√	√	√	√	√
	52.10	Warehousing and storage	√	√	√	√	√

### Data collection

Eurostat statistical data on GVA and employment for the above-mentioned NACE codes are taken from the following location: [Link](#).

The resulting figures obtained from Eurostat are presented in the Blue Growth database, sheet “1.1 deep sea shipping”, “1.2 Short sea shipping”, “1.3 passenger ferry services” and “1.4 inland shipping”, and are also presented in part D (excel data file containing all input data, calculations and output).

The tables show that for several NACE sectors, data are missing for one or more years. This means that additional assumptions are needed. For sectors where the latest year (2010) was not available but an earlier year was, this earlier year was included instead. This means that for a number of countries, the overall estimate is not ‘for 2010’, but ‘for the latest available year’, and in fact based on data from multiple years.

### Allocation maritime/non-maritime

All NACE sectors under ‘water transport services’ are considered 100% maritime. NACE 52.22 Service activities incidental to water transportation is also assumed to be 100% maritime. For the remaining two NACE sectors, a split between maritime and non/maritime is needed, and is made as follows:

- 52.24 Cargo handling: to split the GVA and employment data for his NACE sector, an estimate of the share of maritime cargo that is handled in the respective country compared to the total volume of cargo handled. If (national) statistics give figures at a lower aggregation level (5-digit) the share can be calculated. If not, an expert estimate is given based on figures from other countries and on the general country structure. For instance in France, a breakdown of NACE 52.24 into 52.24A and B is available, with A representing seaport cargo handling and B non-seaport cargo handling. However in most other countries, such breakdown is not available. Secondary sources were used including Ecotec (2006)<sup>7</sup>, which indicate the seaport related share of cargo handling to be in the order of 50%. This figure was used unless country-specific statistics were found (like for France where the figure resulted in 48%) or where country experts proposed alternative proxies (see below);
- 52.10 Warehousing and storage. The share of warehousing and storage that can be considered maritime is considered to be the same as the share of maritime cargo resulting from the above.

## Allocation to MEAs

As indicated above in Table 4.1, a number of NACE sectors relate to multiple MEAs. The allocation is made as follows:

- 50.20 Sea and coastal freight water transport needs to be split between 1.1 deep sea shipping and 1.2 short sea shipping. This is done on the basis of the shares of short sea vs deep sea in total traffic in each country as given by Eurostat<sup>8</sup>. If a share is marked 'unknown' this is added to the deep sea segment and gives the key **ratio deep sea versus short sea**;
- 50.10 Sea and coastal passenger water transport needs to be split between 1.3 Passenger ferry services and 4.3 cruise tourism. This is done on the basis of the ratio of passengers transported versus the total number of passengers embarked/disembarked in each country. Both figures are taken from Eurostat, and combined give the key **ratio of ferry versus cruise**;
- For 77.34 Renting and leasing of water transport, 52.22 Service activities incidental to water transportation, 52.24 Cargo handling and 52.10 Warehousing and storage, an allocation between 5 MEA needs to be made as indicated in Table 4.1 above. This is done as follows:
  - First, a split between cargo and passenger shipping is needed. This is calculated taking the GVA and employment data for NACE sectors 50.10, 50.20 and 50.40, and calculating the shares of each sector. The underlying assumption is that the importance of port service sectors is linearly related to the size of the transport sectors themselves and give the keys **ratios of sea freight, passenger and inland water transport**;
  - Subsequently, the resulting key is combined with the allocation keys developed above, as follows:
    - MEA 1.1 deep sea shipping: ratio sea freight \* ratio deep sea;
    - MEA 1.2 short sea shipping: ratio sea freight \* ratio short sea;
    - MEA 1.3 passenger ferry services: ratio sea passenger \* ratio ferry;
    - MEA 1.4 inland water transport: ratio inland water transport;
    - MEA 4.3 cruise tourism: ratio sea passenger \* ratio cruise.

In part D of this annex (excel database) the ratios applied for each country are given, including underlying calculations and sources of data.

## Allocation to sea basins

In order to allocate MEA 2.1 (deep sea shipping) and 2.2 (short sea shipping to different sea basins for DK-DE-FR-ES-UK, the weight of each maritime NUTS 2 over the national total in terms freight volumes. Data about maritime transport of freight by NUTS 2 regions are available in Eurostat ([Link](#), select only the geographic parameter).

For the allocation of NUTS 2 to different sea basins, please see this [Link](#).

For 1.3 passenger ferry services, the same approach as taken for 1.1 and 1.2 is followed. Data by NUTS 2 are available at the following [Link](#) (only the geographic parameter needs to be selected). It has to be taken into account that passengers reported in this section regard only ferry services (excluding cruise tourism).

<sup>8</sup> [http://appsso.eurostat.ec.europa.eu/nui/show.do?query=BOOKMARK\\_DS-064781\\_QID\\_-21965EB6\\_UID\\_-3F171EB0&layout=TIME,C,X,0;REP\\_MAR,B,Y,0;PAR\\_MAR,B,Z,0;UNIT,B,Z,1;INDICATORS,C,Z,2;&zSelection=DS-064781UNIT\\_PC\\_TOT;DS-064781PAR\\_MAR\\_NON\\_SSS;DS-064781INDICATORS\\_OBS\\_FLAG;&rankName1=PAR-MAR\\_1\\_2\\_0\\_1&rankName2=INDICATORS\\_1\\_2\\_-1\\_2&rankName3=UNIT\\_1\\_2\\_-1\\_2&rankName4=TIME\\_1\\_0\\_0\\_0&rankName5=REP-MAR\\_1\\_2\\_0\\_1&pprRK=FIRST&pprSO=PROTOCOL&ppcRK=FIRST&ppcSO=ASC&sortC=ASC\\_-1\\_FIRST&rStp=&cStp=&rDCh=&cDCh=&rDM=true&cDM=true&footnes=false&empty=false&wai=false&time\\_mode=NONE&lang=EN&cfo=%23%23%23%2C%23%23%23.%23%23%23](http://appsso.eurostat.ec.europa.eu/nui/show.do?query=BOOKMARK_DS-064781_QID_-21965EB6_UID_-3F171EB0&layout=TIME,C,X,0;REP_MAR,B,Y,0;PAR_MAR,B,Z,0;UNIT,B,Z,1;INDICATORS,C,Z,2;&zSelection=DS-064781UNIT_PC_TOT;DS-064781PAR_MAR_NON_SSS;DS-064781INDICATORS_OBS_FLAG;&rankName1=PAR-MAR_1_2_0_1&rankName2=INDICATORS_1_2_-1_2&rankName3=UNIT_1_2_-1_2&rankName4=TIME_1_0_0_0&rankName5=REP-MAR_1_2_0_1&pprRK=FIRST&pprSO=PROTOCOL&ppcRK=FIRST&ppcSO=ASC&sortC=ASC_-1_FIRST&rStp=&cStp=&rDCh=&cDCh=&rDM=true&cDM=true&footnes=false&empty=false&wai=false&time_mode=NONE&lang=EN&cfo=%23%23%23%2C%23%23%23.%23%23%23)

For 1.4 inland water transport, the following allocation is applied:

- For Germany, 1.4 has been totally allocated to the North-sea;
- For UK it has been allocated to the North-sea.
- For France, Country editors have investigated national sources (i.e. Voies navigable de France, VNF) in order to achieve the share of different sea-basins;
- For Spain, it has been completely attributed to the Mediterranean.

### Country-specific adjustments

For applying the methodology as specified above, a number of country specific adjustments were needed, mainly because of data gaps in the basic data set from Eurostat (see explanations below).

#### ➤ Belgium

The problem when estimating the size of MEAs 1.1-1.4 in Belgium with data based on Eurostat is that for various codes data for 2010 is not available as shown in the next two tables:

**Table 4.2** GVA data on NACE codes used for MEAs 1.1, 1.2, 1.3, 1.4, 4.3

NACE 2	Sector	2008	2009	2010
5020	Sea and coastal freight water transport	n/a	148.3	n/a
5010	Sea and coastal passenger water transport	n/a	n/a	57.4
5040	Inland water transport	77.6	40.5	47.7
7734	Renting and leasing of water transport	n/a	23.9	n/a
5222	Service activities incidental to water transportation	695.4	852.2	n/a
5224	Cargo handling	1457.4	1322.4	1215.2
5210	Warehousing and storage	709.1	747.5	924.5

Source: Eurostat SBS

**Table 4.3** Number of persons employed data on NACE codes used for MEAs 1.1, 1.2, 1.3, 1.4, 4.3

NACE 2	Sector	2008	2009	2010
5020	Sea and coastal freight water transport	n/a	238	n/a
5010	Sea and coastal passenger water transport	n/a	n/a	269
5040	Inland water transport	441	385	589
7734	Renting and leasing of water transport	n/a	78	n/a
5222	Service activities incidental to water transportation	3,263	4,906	n/a
5224	Cargo handling	7,639	6,295	5,224
5210	Warehousing and storage	8,659	8,040	10,574

Source: Eurostat SBS

Therefore sticking to the exact methodology provides no results for various MEAs for Belgium. As data is available for previous years we decided to always use the most recent year available in the case of Belgium to estimate the size of the MEAs 1.1-1.4 in Eurostat. This means that for the calculation of GVA and employment in MEAs 1.1, 1.2, 1.3, 1.4 and 4.3 in NACE 50.20, 77.34 and 52.22 data for the year 2009 instead of 2010 was used.



➤ **Germany**

According to the judgement of our country editor the assumption that 50 % of Cargo is maritime related does not hold for Germany. Instead, 25 % was considered to be better justified given the large shares of Germany being far from the coast. Therefore 25 % of NACE 2 52.24 Cargo handling and 52.10 Warehousing and storage were assumed to be maritime.

➤ **Norway**

Due to the availability of more precise official national data (specific data available on short sea vs. deep sea shipping distinguishing between persons employed and GVA are available) in Norway certain keys to allocate NACE codes were replaced by national data, given in the table below.

**Table 4.4** Share of short sea shipping and deep sea shipping concerning number of persons employed and GVA for Norway

Key for	Type of shipping	2008	2009	2010
Number of persons employed	Short Sea Shipping	11.7%	11.2%	12.7%
	Deep Sea Shipping	88.3%	88.8%	87.3%
GVA	Short Sea Shipping	4.7%	4.8%	4.9%
	Deep Sea Shipping	95.3%	95.2%	95.1%

**Table 4.5** Shares of transport modalities in Norway

Key for	shares of transport modalities	2008	2009	2010
GVA	Percentage freight (deep sea + short sea)	85%	83%	82%
Employment	Percentage freight (deep sea + short sea)	60%	63%	63%
GVA	Percentage passenger (ferry + cruise)	15%	17%	18%
Employment	Percentage passenger (ferry + cruise)	40%	37%	37%

Furthermore, according to the Norwegian country editor, cargo handling can be assumed to be 100 % maritime in Norway. We therefore also assume warehousing and storage to be 100 % maritime. Thus 100 % of NACE 2 52.24 Cargo handling and 100 % 52.10 Warehousing and storage were assumed to be maritime.

**Resulting figures**

See part D (excel file presenting all data and calculations).



## 5 Function 2: Food, aquaculture

Under function 2, food, nutrition, health & ecosystem services, the following MEA are defined, of which four allow the use of Eurostat NACE based data as a correspondence to NACE sectors can be made. These are:

- 2.1 Catching fish for human consumption
- 2.2 Catching fish for animal consumption
- 2.3 Marine aquatic resources
- 2.5 Agriculture on saline soils

### 5.1 MEA 2.1 and 2.2 Catching fish for human and animal consumption

The elaboration for 2.1 (Catching fish for human consumption) and 2.2 (Catching fish for animal consumption) was done in combination, as value chains are largely similar, and an allocation between the two was made on the basis of a distinct allocation key. Hence the two sectors are addressed in one section here.

#### Value chain

In each of these two MEAs, according to the Blue Growth study methodology, 2 types of activities are included:

- Fishing activities
- Fish processing
- Wholesale and retail

#### Corresponding NACE sectors

Data available at EU level do not distinguish fishing activities between human consumption and non-food use, neither for fishing and processing. Only for fish processing it is possible to estimate GVA and employment according to the two different uses of products (food use vs non-food use).

In order to split NACE rev. 2 code C 10.20 (Fish processing) in activities related to fish for human and animal consumption, we have made use of Prodcom data for total value of sold production (see below under 'Allocation between MEA' for a further explanation).

The resulting corresponding coding sets of JRC, Eurostat Prodcom and Eurostat NACE sectors are as follows:

#### 2.1 Catching fish for human consumption

- A03.11 and A03.12 share of production based on value added by fish species
- C10.20 share of fish processing
- 46.38 Wholesale of other food, including fish, crustaceans and molluscs
- 47.23 Retail sale of fish, crustaceans and molluscs in specialised stores

#### 2.2 Catching fish for animal consumption

- A03.11 and A03.12 share of production based on value added by fish species
- C10.20 share of fish processing

Despite the fact that "Wholesale" may include also other items different than fish, we assume that wholesale of fish products constitutes the total of the NACE codes.

### Data collection

Data on GVA and employment in the fisheries sector are taken from The 2012 Annual Economic Report on the EU Fishing Fleet (JRC STECF-12-10), [Link](#).

Eurostat statistical data on GVA and employment for the above-mentioned NACE codes are taken from the following location: [Link](#).

Prodcom data on the types of fish e.g. to split between human and animal consumption are taken from Eurostat Prodcom, [Link](#).

Data on wholesale and retail are taken from Eurostat as well, [Link](#).

The input data can also be found in part D, excel data file.

### Allocation maritime/non-maritime

Not applicable.

### Allocation to MEAs

In Prodcom statistics products groups are identified by an 8-digit code. The overview below presents all relevant codes for processed fish production, divided between food use and non-food use. The first four digits are the classification of the producing enterprise given by the Statistical Classification of Economic Activities in the European Community (NACE) and the first six correspond to the CPA. The remaining digits specify the product in more detail.

**Table 5.1 List of PRODCOM processed fish**

fit for human consumption	10201100	Fresh or chilled fish fillets and other fish meat without bones
	10201200	Fresh or chilled fish livers and roes
	10201330	Frozen whole salt water fish
	10201360	Frozen whole fresh water fish
	10201400	Frozen fish fillets
	10201500	Frozen fish meat without bones (excluding fillets)
	10201600	Frozen fish livers and roes
	10202100	Fish fillets, dried, salted or in brine, but not smoked
	10202200	Flours, meals and pellets of fish, fit for human consumption; fish livers and roes, dried, smoked, salted or in brine
	10202350	Dried fish, whether or not salted; fish, salted but not dried; fish in brine (excluding fillets, smoked, heads, tails and maws)
	10202425	Smoked Pacific, Atlantic and Danube salmon (including fillets, excluding heads, tails and maws)
	10202455	Smoked herrings (including fillets, excluding heads, tails and maws)
	10202485	Smoked fish (excluding herrings, Pacific, Atlantic and Danube salmon), including fillets, excluding head, tails and maws
	10202510	Prepared or preserved salmon, whole or in pieces (excluding minced products and prepared meals and dishes)
	10202520	Prepared or preserved herrings, whole or in pieces (excluding minced products and prepared meals and dishes)

	10202530	Prepared or preserved sardines, sardinella, brisling and sprats, whole or in pieces (excluding minced products and prepared meals and dishes)
	10202540	Prepared or preserved tuna, skipjack and Atlantic bonito, whole or in pieces (excluding minced products and prepared meals and dishes)
	10202550	Prepared or preserved mackerel, whole or in pieces (excluding minced products and prepared meals and dishes)
	10202560	Prepared or preserved anchovies, whole or in pieces (excluding minced products and prepared meals and dishes)
	10202570	Fish fillets in batter or breadcrumbs including fish fingers (excluding prepared meals and dishes)
	10202580	Other prepared or preserved fish, whole or in pieces (excluding minced products and prepared meals and dishes)
	10202590	Prepared or preserved fish (excluding whole or in pieces and prepared meals and dishes)
	10202630	Caviar (sturgeon roe)
	10202660	Caviar substitutes
	10203100	Frozen crustaceans, frozen flours, meals and pellets of crustaceans, fit for human consumption
	10203200	Molluscs (scallops, mussels, cuttle fish, squid and octopus), frozen, dried, smoked, salted or in brine
	10203400	Prepared or preserved crustaceans, molluscs and other aquatic invertebrates (excluding chilled, frozen, dried, salted or in brine, crustaceans, in shell, cooked by steaming or boiling) (excluding prepared meals and dishes)
	10204250	Fish heads, tails and maws, other edible fish offal: dried, salted or in brine, smoked
	10851200	Prepared meals and dishes based on fish, crustaceans and molluscs
unfit for human consumption	10204100	Flours, meals and pellets of fish or of crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption
	10204200	Inedible fish products (including fish waste; excluding whalebone and whalebone hair, coral and similar materials, shells and cuttle-bone, unworked or simply prepared/natural sponges)

For each country, the % of each use (fit and unfit for human consumption) on the total value of sold processed production is calculated. In most countries, the share fit for human consumption is (close to) 100%. This ratio is then applied to the data on GVA and employment for fishing and fish processing, and allocated to MEAs 2.1 and 2.2 respectively.

NACE sectors 46.38 wholesale and 47.23 retail are 100% allocated to MEA 2.1 fish for human consumption.

### Allocation to sea basins

The need for allocating data between different sea basins concerns to 5 Member States: Denmark, France, Germany, Spain, and the UK.

Since data on fish landings are available at sea basin level through several sources, these have been used as a proxy.

For Denmark, France and the UK, data available through the European Market Observatory of Fisheries and Aquaculture products (EUMOFA, [link](#)) are used. According to the EUMOFA, landings can be allocated as follows:

**Table 5.2 Value (in €) and volumens (in tons) for the year 2012 for fish landings**

		Value (€) - 2012	%	Volume (tonnes) - 2012	%
Denmark	Baltic Sea	34.571.726,69	11,09%	33.373,81	13,38%
	North Sea	277.214.734,86	88,91%	216.055,13	86,62%
	TOT.	311.786.461,55		249.428,94	
France	Bay of Biscay and Iberian Coast	349.923.610,42	55,76%	98.443,27	47,48%
	Celtic Seas	174.532.753,18	27,81%	68.189,90	32,89%
	Mediterranean	32.184.971,14	5,13%	8.632,43	4,16%
	North Sea	70.870.462,13	11,29%	32.078,08	15,47%
	TOT.	627.511.796,87		207.343,67	
United Kingdom	Celtic Seas	333.843.963,44	45,11%	169.725,68	36,74%
	North Sea	406.205.999,99	54,89%	292.227,73	63,26%
	TOT.	740.049.963,43		461.953,41	

“Celtic Seas” and “Bay of Biscay and Iberian Coast” are names used for the EUMOFA’s purposes, but can be entirely attributed to the Atlantic Sea.

The year of reference is 2012, but it is reasonable to assume that the proportion of landings between sea basins is similar in the previous years. Value data rather than volume data are applied for allocation, as this is considered more closely related to the economic dimension of fisheries.

For Spain and Germany, data are not available via the EUMOFA. Sector reports and statistical offices, however, report fish landings broken down by sea basins:

- **Germany:** the report [Die Hochsee- und Küstenfischerei in der Bundesrepublik Deutschland](#) (2001), published by BLE, report fish landings by Länder. It should be easy to separate Baltic from North Sea Länder, and assign the respective shares. The only problem is with *Schleswig-Holstein which borders on both the Baltic and the North Sea. It is suggested that the country expert investigate whether it is possible to have further specification at Länder level;*
- **Spain:** data on landings are available via the statistical institutes of the Autonomous Communities. It turns out that on a total of 392.008.056,86 kg landed in Spain in 2010, 85.732.162,06 (**21,87%**) were landed in Mediterranean ports, while 306.275.894,80 (**78,13%**) were landed in Atlantic ports. These data do not consider fish landed in the Balearic Islands, the Canary Islands, Ceuta and Melilla. It is estimated that these landings would not alter the above proportion significantly. Data on value are landings were not available for all the autonomous communities, however, once again, the proportion is likely to remain the same.

### Country-specific adjustments

Data for fishing in Norway are not given in the JRC STECF report. Hence alternative sources were used (see part D and the country fiches). However we do have Eurostat based data on fish processing in Norway.

For Ireland, data on wholesale (46.38) and retail (47.23) is lacking from Eurostat. For the Netherlands, data on retail (47.38) is also lacking.

### Resulting figures

See part D (excel data file including source data and calculations)

## 5.2 MEA 2.3 Marine aquatic resources

### Value chain

No detailed value chain was developed for this MEA, but focus was laid on the specific NACE sector identified.

### NACE correspondence

A specific NACE code is available for this sub-function: 03.21 Marine aquaculture, but no data are available in Eurostat SBS. However data on NACE sector 03.21 is available through JRCs Technical report, An Approach Towards European Aquaculture Performance Indicators. In the JRC report, GVA and persons employed are available for: freshwater, marine and shellfish farming. For the purpose of our analysis, marine and shellfish farming will be aggregated.

Data from this source is only available for 2010 and lacking for Belgium and Norway.

### Allocation maritime/non-maritime

Not applicable

### Allocation to MEAs

Not applicable

### Allocation to sea basins

A study published by the European Parliament in 2007 (with 2005 data) "Regional dependency on fisheries" report aquaculture production broken down by Member State and sea basin. The situation for our country of interest is as follows:

Table 5.3 Value added in mln€ for 2005 split by country and sea basin

		Value added (mln €) - 2005	%
Spain	Mediterranean	93,8	43,09%
	Atlantic	123,9	56,91%
	<i>TOT.</i>	217,7	
Germany	Baltic	0,8	53,33%
	North Sea	0,7	46,67%
	<i>TOT.</i>	1,5	
France	Mediterranean	31,3	9,73%
	Atlantic	290,3	90,27%

Value added (mIn €) - 2005			%
	TOT.	321,6	
United Kingdom	Atlantic	187,4	82,05%
	North Sea	41,0	17,95%
	TOT.	228,4	

### Country-specific adjustments

Not applicable.

### Resulting figures

See part D (excel data file including input data and calculations).

## 5.3 MEA 2.5 Agriculture on Saline soils

### Value chain

No detailed value chain was considered for this MEA, but focus was laid on the agriculture sector as a whole and the share of which that can be considered saline. For that a spatial allocation was made, see below under 'allocation maritime/non-maritime'.

### Corresponding NACE sectors

Statistics on GVA and employment are derived from Eurostat and do not distinguish between agriculture on saline soils and agriculture on not saline soils. Hence an allocation mechanism is needed (see below under 'allocation maritime/non-maritime').

According to EAA 97 Rev.1.1 classification, the GVA of agriculture and farming is calculated at basic prices for the 2005 – 2010 period. The total number of persons employed as Regular Labour force is available on Eurostat statistics on Structure of holdings for three years: 2005, 2007 and 2010.

### Data collection

Data regarding GVA and persons employed are available in the Eurostatdatabase (Economic Account of Agriculture and Structure of agricultural holdings). Basic data needed which should be downloaded for the purpose of our analysis are:

- Gross Value added at basic prices: [Link](#)
- Number of persons employed: [Link](#)

Data are also included in part D (excel data file).

### Allocation maritime/non-maritime

Saline soils are defined in the Saline and Sodic Soils Map (JRC, see this [link](#)) that shows the distribution of saline, sodic and potentially salt affected areas within the European Union.

To estimate GVA and employment of agriculture on saline soils, first of all the % of agriculture surfaces on saline soil on the total agricultural area at NUTS 2 level has been calculated by using GIS environment. In this way, landlocked regions have been excluded.



For this purpose, two geographical datasets have been used. The first one is the Corine Land Cover dataset, referred to 2006 (updated in 2012) and available on the EEA website:

<http://www.eea.europa.eu/data-and-maps/data/clc-2006-vector-data-version-2>

For our purposes we need to merge together areas of the following classes of agricultural land cover:

**Table 5.4** Types of land definition

2.1 Arable land	2.1.1 Non-irrigated arable land
	2.1.2 Permanently irrigated land
	2.1.3 Rice fields
2.2 Permanent crops	2.2.1 Vineyards
	2.2.2 Fruit trees and berry plantations
	2.2.3 Olive groves
2.3 Pastures	2.3.1 Pastures
2.4 Heterogeneous agricultural areas	2.4.1 Annual crops associated with permanent crops
	2.4.2 Complex cultivation patterns
	2.4.3 Land principally occupied by agriculture, with significant areas of natural vegetation
	2.4.4 Agro-forestry areas

The second geographical dataset is the “**Saline and Sodic Soils Map**” published by the JRC on **November 2009 and available, upon request, on the European Soil Portal:**

<http://eussoils.jrc.ec.europa.eu/library/themes/salinization/data.html>

The accuracy of input data only allows the designation of salt affected areas with a limited level of reliability (e.g. < 50 or > 50% of the area)

For our purposes areas of the following classes of soil salinisation have been merged:

- 1 - Saline > 50% of the area
- 2 - Sodic > 50% of the area
- 3 - Saline > 50% of the area
- 4 - Sodic < 50% of the area
- 5 - Potentially salt affected soils.

In GIS we overlapped and intersected the layer of saline areas with the layer of agricultural areas. In this way, the agricultural saline areas layer by region has been achieved. The percentage of agricultural saline area on the total agricultural area will be applied to estimate its fixed contribution on the total agriculture GVA and the employment for years 2005, 2007, 2010 and for coastal regions.

Regional % of agriculture on saline soils for all NUTS2 level regions with salinization problems have been provided. The calculations and resulting percentages are included in part D (excel data file) for all NUTS2 regions that i) are coastal and ii) have saline soils.

The percentage of saline soils for individual NUTS-2 regions was assumed constant for the period 2008-2010.

#### Allocation to MEAs

Not applicable.

### **Allocation to sea basins**

The methodology proposed above provides data at NUTS 2 level, which were assigned to the relevant sea basins.

### **Country-specific adjustments**

The approach applied only provided data for Germany, France, Portugal and Spain. In other countries, the share of saline soils was found to be zero according to the stated sources.

### **Resulting figures**

See part D (excel data file including input data and calculations).

## 6 Function 3: Energy & raw materials

Under function 3, Energy & Raw Materials, seven MEA are identified; of which three can be linked to statistical NACE sectors. These are:

- 3.1 Oil & gas
- 3.5 Aggregates mining
- 3.7 Fresh water supply (desalination)

### 6.1 MEA 3.1 Oil & gas

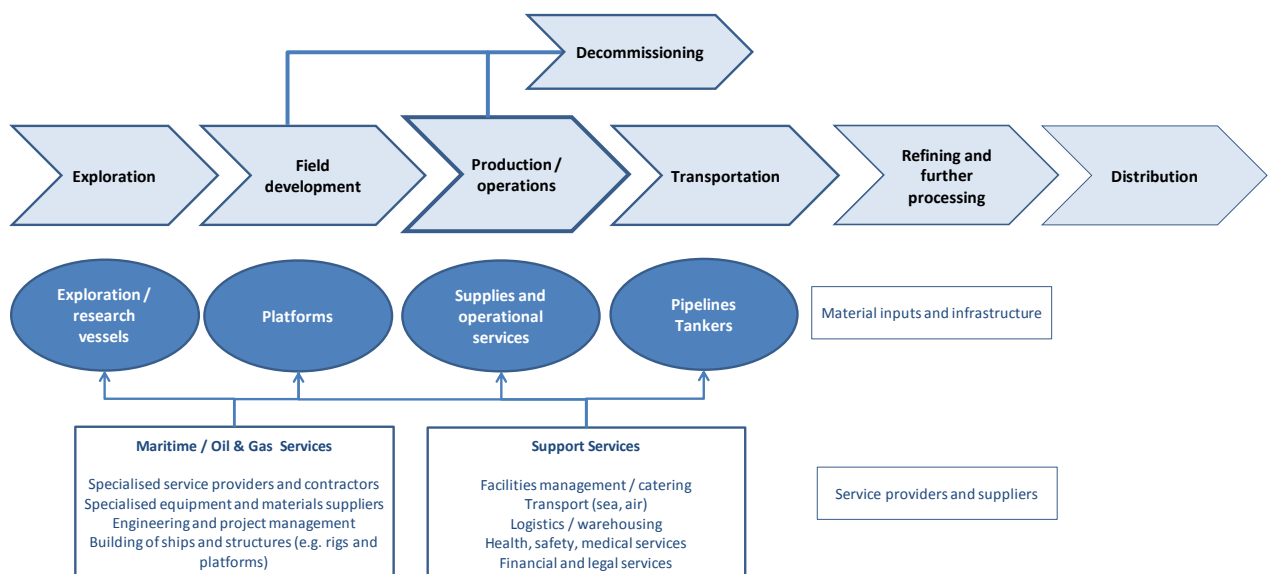
#### Value chain

This MEA covers offshore extraction and processing of fossil fuels (hydrocarbons). The MEA consists of two main segments:

- Crude oil production.
- Natural gas production.

The value chain of the offshore oil and natural gas MEA is illustrated in Figure 6.1, which is based on Ecorys (2012)<sup>9</sup> and supplementary information relating to the sector<sup>10</sup>.

Figure 6.1 Offshore oil and gas: simplified visualisation of value chain



#### Principal maritime (offshore) value-added generating activities

The (upstream) offshore oil and gas value chain consists of the following main activities:

- **Exploration:** covering activities such as acquisition/analysis of seismic data and production drilling;

<sup>9</sup>Ecorys (2012), 'Blue Growth: Scenarios and Drivers for Sustainable Growth from Oceans, Seas and Coasts', together with the accompanying 'Maritime Sub-Function Profile Report: Offshore oil and natural gas (3.1)'.

<sup>10</sup>Oil & Gas UK (2012), 'Economic Report 2012'; Ernst and Young (2012), 'Review of the UK oilfield services industry 2012'.

- **Field development:** covering activities such as engineering, and fabrication and installation of rigs, platforms, etc.;
- **Production and operation (exploitation):** covering activities to bring oil and gas to the surface
- **Processing:** primarily concerned with offshore processing of raw natural gas to attain 'pipeline quality' (i.e. 'cleaning' of raw natural gas to remove water, impurities, hydrocarbons, etc.)
- **Transportation:** covering offshore to onshore transportation via pipeline or ship (e.g. shuttle tankers)

In addition, the offshore component of value chain can be taken to include:

- **Decommissioning:** covering activities to decommission offshore oil and gas infrastructure.

### Downstream (non-maritime) value-added generating activities

The above mentioned (upstream) activities, integrate into the overall oil and gas value chain, that encompasses (downstream) activities such as:

- Transportation and storage (onshore);
- Refining and further processing using oil and gas as a feedstock (e.g. petrol refining);
- Energy supply (e.g. gas supply, electricity generation);
- Transformation of oil and gas products used as intermediate inputs in a wide range of industrial sectors;
- Distribution and marketing.

### Supporting suppliers and service providers

The (upstream) offshore oil and gas production activities also rely on a wide range of suppliers of goods and services, with varying degrees of specialisation towards the oil and gas sector and, more specifically, to offshore oil and gas extraction and processing. In general terms, these can be sub-divided into two main categories:

1. **Specialist suppliers of 'Maritime' / 'Oil & Gas' equipment, materials and services.** Primarily this covers the supply of specialised products and services to the offshore oil and gas sector. Typically this would cover products and services provided by the main contractors and specialist service providers (e.g. consultancies) of the operators of offshore oil and gas facilities.
2. **Suppliers of other supporting services.** Primarily this covers other types of 'external' services supplied to the operators of offshore oil and gas facilities. This includes 'out-sourced' services (e.g. facilities management, catering, transport, logistics, etc.) and other specialist and professional services (e.g. financial, legal, etc.)

### Corresponding NACE sectors

Table 6.1 provides an overview of the NACE codes that relevant for principal maritime (offshore) value-added generating activities of the oil and gas sector.

As indicated above, the offshore oil and gas sector also encompasses or makes use of a wide range of specialised and non-specialised suppliers of equipment, materials and services. A priori, it is difficult to identify the relative importance of these 'supporting' activities within the overall value chain of the offshore oil and gas sector. This may require a more in-depth assessment of the value (and supply) chain of the offshore oil and gas sector in order to establish the most important economic activities that are linked to the sector. An alternative approach may be to make use of (national) Input-Output Tables (or Supply and Use Tables); such an approach is investigated in the

Annex 2. Based on such

analysis – undertaken for the UK –NACE codes that may be of particular relevance in the context of the ‘supporting’ activities in the overall value chain of the offshore oil and gas sector are indicated in Table 6.1.

**Table 6.1 Overview of main NACE codes for principal value-added generating activities (VGA) of the offshore oil and gas sector**

NACE Rev. 2 code – Economic activity	Type (Primary, Secondary, Tertiary)	Corresponding MEA value chain components (VGA)	Comments
06.10 Extraction of crude petroleum	S	Production / operations	Requires a separation between offshore and onshore activities
06.20 Extraction of natural gas	S	Production / operations Processing (offshore)	Requires a separation between offshore and onshore activities
09.10 Support activities for petroleum and natural gas extraction	S	Exploration Decommissioning	Requires a separation between offshore and onshore activities
30.11 Building of ships and floating structures	P	Field development	Requires identification of part of ‘offshore oil and gas’ in total. Relevant for several MEAs. Ignored here as it is included as part of a separate MEA 0.1, see above.
33.15 Repair and maintenance of ships and boats	P	Field development	Requires identification of part of ‘offshore oil and gas’ in total. Relevant for several MEAs. Ignored here as it is included as part of a separate MEA 0.1, see above.
49.50 Transport via pipelines	T	Transportation	Ignored. Requires an identification of part of ‘offshore oil and gas’ in total.
50.20 Sea and coastal water transport	P	Transportation	Requires identification of part of ‘offshore oil and gas’ in total. Relevant for several MEAs. Ignored here as it is included as part of a separate MEA 1, see above.
71.12 Engineering activities and related technical consultancy	T	Exploration	Ignored. Requires identification of part of ‘offshore oil and gas’ in total. Relevant for several MEAs
38.31 Dismantling of wrecks	T	Decommissioning	Ignored Requires identification of part of ‘offshore oil and gas’ in total. May be relevant for some other MEAs

Further to this a multitude of other NACE sectors is of relevance in the tertiary category, such as parts of many manufacturing sectors, construction, financial and other services. The identified Primary sectors are already covered under other MEA. Hence only the Secondary sectors are included in the size estimation of this MEA.

#### Data collection

Eurostat data on GVA and employment for the above-mentioned selected NACE codes 06.10, 06.20 and 09.10 are taken from the following location: [Link](#).

Data are also included in part D (excel data file).

The tables from Eurostat make clear that data availability from Eurostat is limited, which is considered partly due to the confidential nature of data provided related to low numbers of (large) enterprises in these sectors.

#### Allocation maritime/non-maritime

To define the maritime share, use was made of the following two data sources:

- Primary production of crude oil and Primary production of natural gas, both in 1000 tonnes of oil equivalent, per country, from Eurostat<sup>1112</sup>
- Offshore oil & gas production data from JRC Offshore Authorities Group<sup>13</sup>.

These were used to calculate the offshore share in total production, per country, for oil and for gas separately. Under the assumption that GVA and employment per unit of oil produced is the same onshore and offshore, subsequently the offshore data was calculated. For NACE sector 09.10, the weighted average share of oil & gas jointly was taken for the calculation. Figures were based on data for 2011 and considered constant over the years assessed in this study (2008-2010).

The oil and gas production data from Eurostat used to calculate maritime shares are also included in part D (excel data file).

#### Allocation to MEAs

Not applicable.

#### Allocation to sea basins

For the largest oil & gas producing countries, the locations of work are generally known (example UK is mainly North Sea). The allocation could thus be based on expert opinions. The UK publishes for instance a map on offshore concessions, see <https://www.gov.uk/oil-and-gas-offshore-maps-and-gis-shapefiles>. Country editors have checked if similar information could be found in their countries (for those bordering multiple sea basins only).

#### Country-specific adjustments

The offshore share for Norway could not be derived from JRC and Eurostat but was estimated by the country editor for Norway. For the UK and Denmark, based on the JRC and Eurostat data the offshore share turned out to be more than 100%. As a result offshore oils and gas was assumed to be 100%.

#### Resulting figures

Resulting figures for GVA and employment are given in part D (excel data file including input data and calculations).

---

<sup>11</sup> <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=ten00078>

<sup>12</sup> <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=ten00079>

<sup>13</sup> <http://euoag.jrc.ec.europa.eu/node/63>

## 6.2 MEA 3.5 Aggregates mining

### Value chain

This MEA covers extraction of marine aggregates (sands and gravels) from the seabed.

The value chain of the marine aggregates MEA is not described in the Blue Growth study<sup>14</sup>.

Essentially the value chain consists of:

- Extraction of marine aggregates (dredging)
- Processing of aggregates (e.g. at wharfs)
- Downstream activities:
  - Manufacture of products (e.g. concrete)
  - Final demand (e.g. construction sector)
- Ancillary services:
  - Exploration services
  - Shipbuilding and repair
  - Transport services

### Corresponding NACE sectors

Table 6.2 provides an overview of the NACE codes that are relevant for principal maritime (offshore) value-added generating activities of the marine aggregates sector.

**Table 6.2 Overview of main NACE codes for principal value-added generating activities (VGA) of the offshore oil and gas sector**

NACE Rev. 2 code – Economic activity	Type (Primary, Secondary, Tertiary)	Corresponding MEA value chain components	Comments
08.12 Operation of gravel and sand pits; mining of clays and kaolin	P	Production / operations	Requires a separation between offshore and onshore activities
09.90 Supporting activities for other mining and quarrying	P	Production / operations Processing (offshore)	Requires a separation between offshore and onshore activities
30.11 Building of ships and floating structures	S	Ancillary	Requires identification of part of 'marine aggregates' in total. Relevant for several MEAs. Ignored here but included under MEA 0.1.
33.15 Repair and maintenance of ships and boats	S	Ancillary	Requires identification of part of 'marine aggregates' in total. Relevant for several MEAs. Ignored here but included under MEA 0.1.
50.20 Sea and coastal water transport	S	Ancillary	Requires identification of part of 'marine aggregates' in total. Relevant for several MEAs. Ignored here but included under MEA 1.1-1.2.
71.12 Engineering activities and related	T	Ancillary	Requires identification of part of 'marine aggregates' in total.

<sup>14</sup>Ecorys (2012), 'Blue Growth: Scenarios and Drivers for Sustainable Growth from Oceans, Seas and Coasts', together with the accompanying 'Maritime Sub-Function Profile Report: Offshore oil and natural gas (3.1)'.

NACE Rev. 2 code – Economic activity	Type (Primary, Secondary, Tertiary)	Corresponding MEA value chain components	Comments
technical consultancy			Relevant for several MEAs. Ignored (tertiary)
38.31 Dismantling of wrecks	T	Decommissioning	Requires identification of part of 'marine aggregates' in total. May be relevant for some other MEAs. Ignored (tertiary)

In the analysis only the two primary NACE codes have been included in the quantification of this MEA, as the secondary codes are already covered under other MEAs.

A limitation of the data is that the NACE category (08.12) covers not only operation of gravel and sand pits (including dredging of sand and gravel) but 'mining of clays and kaolin'. There appears to be no available data source that provides comparable data on production of 'sand and gravel' and 'clays and kaolin'.<sup>15</sup> Nonetheless, it appears that production of 'clays and kaolin' accounts for only a very small proportion of NACE 08.12. Hence we propose to keep the entire sector.

Another problem is the fact that NACE 09.90 covers also supporting activities to other mining and quarrying activities next to sand and gravel, except for those activities related to petroleum and natural gas extraction (i.e. NACE 09.90 also covers activities related to mining/quarrying of coal, metal ores, and ornamental and building stone).

#### Data collection

Eurostat data on GVA and employment for the above-mentioned selected NACE codes are taken from the following location: [Link](#).

Data are also included in part D (excel data file).

#### Allocation maritime/non-maritime

For allocating the above data between maritime and non/maritime, use was made of data from UEPG, who publish data on aggregates production given estimates for both marine aggregates and total aggregates production, both in volumes (million tonnes)<sup>16</sup>. Under the assumption that GVA and employment per unit of production are the same onshore and offshore, the ratios were used to calculate the marine GVA and employment.

Data from UEPG as well as the calculated offshore shares per country are also included in part D (excel data file).

#### Allocation to MEAs

Not applicable.

<sup>15</sup>Some comparative data on kaolin production volumes is available from euromines (see: <http://www.euromines.org/mineral/Kaolin>) based on data from the Austrian Federal Ministry for Economy, Family and Youth (see the publication Woeld Mining Data, available at: <http://www.en.bmwfj.gv.at/Energy/MineralRawMaterials/Seiten/default.aspx>).

<sup>16</sup><http://www.uepg.eu/statistics/estimates-of-production-data/data-2010>



### Allocation to sea basins

ICES (see table below) provides data broken down by main sea basins for the countries bordering multiple sea basins (see Table 6.3 above). Country experts have verified these data with statistics at a national level.

**Table 6.3 Marine aggregates production by type (use), country and marine area (2010) in 1000 M<sup>3</sup>**

	Construction / Industrial aggregates	Beach replenishment	Construction fill / land reclamation	Non aggregate	Total extracted	Aggregate exported
Belgium	1,841	336	0	0	<b>2,176</b>	N/d
Denmark (HELCOM)	1,500	100	6,400	1	<b>2,200</b>	250
Denmark (OSPAR)	1,200	2,300	800		<b>4,300</b>	
France (OSPAR)	7,231	0	0	481	<b>7,712</b>	0
France (Med)	0	N/d	N/d	0	<b>N/d</b>	N/d
Germany (HELCOM)	1,533	986	0	N/d	<b>2,522</b>	N/d
Germany (OSPAR)	60	834	N/d	N/d	<b>895</b>	N/d
Lithuania	N/d	110	N/d	N/d	<b>110</b>	N/d
Netherlands	2,800	22,050	97,683	227	<b>122,532</b>	2,222
Portugal (OSPAR)	134	0	0	0	<b>134</b>	0
Spain (OSPAR)	0	207	0	0	<b>207</b>	0
Spain (Med)	0	965	0	0	<b>965</b>	0
UK (OSPAR)	5,987	450	135	0	<b>9,700</b>	3,128

Source: ICES (2011)<sup>17</sup>

### Country-specific adjustments

For a number of countries data on either one of the NACE sector was lacking in Eurostat (e.g. NACE 08.12 missing for Netherlands and Ireland; 09.90 missing for Germany and Ireland; for several other countries one or more years missing). This means that for the said countries no reliable data can be obtained from Eurostat, and for some others no complete growth figures could be established.

### Resulting figures

Resulting figures as well as underlying source data and calculations are included in part D (excel data file).

<sup>17</sup>ICES WGEXT Report 2011, downloaded from : <http://archimer.ifremer.fr/doc/00134/24571/22600.pdf>



## 7 Function 4: Coastal and maritime tourism

Under function 4, coastal and maritime tourism, three MEA are identified, and for each of these, an estimation of their size and growth on the basis of NACE sector data from Eurostat is considered possible. The three MEA are:

- 4.1 Coastal tourism
- 4.2 Yachting and marinas (maritime tourism)
- 4.3 Cruise tourism

### 7.1 MEA 4.1 Coastal tourism

#### Value chain

Coastal tourism includes all shore based sea related tourist and recreational activities. In general, tourism is one of the pillars of the economy of the coastal region. However, not all tourism can be categorised as coastal related tourism. Tourism and recreation activities are not always confined to the coastal environment. Also, it should be pointed out that not all tourism in coastal regions is sea related. For many recreational and tourist activities that take place in the coastal area proximity of the sea is not a condition.<sup>18</sup>

Tourism as such is not defined as an economic sector in statistics. Rather, use is made of different services sectors identified under the NACE code system such as hotels and accommodation, restaurants, transport services, tour operators, etc. We define coastal tourism as follows: Coastal tourism covers beach-based recreation and tourism (e.g. swimming, surfing, sun bathing), and non-beach related land-based tourism in the coastal area (all other tourism and recreation activities that take place in the coastal area for which the proximity of the sea is a condition).<sup>19</sup>

Tourism is a broad industry as it contains attractions and transport, travel organisers and local tourist offices. Moreover, different target groups (e.g. business travellers, leisure tourists, etc.) are served. The tourism industry is also characterised by a geographically dispersed value chain:

- On the one hand, suppliers of tourism products and services – often SMEs – are mainly located in the tourist destination itself.
- On the other hand, the demand side consists of a very heterogeneous group of consumers.

In between we find the intermediaries who bundle, pack and promote the tourism product and make it available to tourists. The intermediaries are located in the tourists' country of origin.<sup>20</sup> In addition to the value chain components mentioned in the Blue Growth study we also see that construction is an important but hard to quantify support activity for this sector.

#### Corresponding NACE sectors

The following table shows the linkage between value chain components and NACE codes. As most statistics do not distinguish between maritime tourism and non-maritime tourism, most codes are

<sup>18</sup> Ecorys (2012): Interim Report of the Blue Growth study on Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts

<sup>19</sup> Ecorys (2013): Not published Interim Report on the Study in support of Impact Assessment work for maritime and coastal tourism

<sup>20</sup> Ecorys (2012): Interim Report of the Blue Growth study on Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts

part of the secondary or tertiary category. Therefore keys to split between coastal and non-coastal are necessary in this MEA. The keys should underline the geographic definition of the sector.

**Table 7.1**      **xxxx**

Value chain component	NACE code	Type (Primary, Secondary, Tertiary)	Comment
<b>Provisioning of travel</b>	79.11 Travel agency activities	S	Ignored, as it would be impossible to determine how much of the value added generated can be attributed to the geographic level of analysis.
	79.12 Tour operator activities	S	Ignored, as it would be impossible to determine how much of the value added generated can be attributed to the geographic level of analysis.
	79.90 Other reservation service and related activities	S	Ignored, as it would be impossible to determine how much of the value added generated can be attributed to the geographic level of analysis.
<b>Operators (accommodation, rental, attraction services)</b>	55.10 Hotels and similar accommodation	S	Code needs to be split between maritime and non-maritime
	55.20 Holiday and other short-stay accommodation	S	Code needs to be split between maritime and non-maritime
	55.30 Camping grounds, recreational vehicle parks and trailer parks	S	Code needs to be split between maritime and non-maritime
	55.90 Other accommodation	S	Code needs to be split between maritime and non-maritime
	56.10 Restaurants and mobile food service activities	T	Ignored as majority is non-maritime
	56.21 Event catering activities	T	Ignored as majority is non-maritime
	56.29 Other food service activities	T	Ignored as majority is non-maritime
	56.30 Beverage serving activities	T	Ignored as majority is non-maritime
	68.10 Buying and selling of own real estate	T	Ignored as majority is non-maritime
	68.20 Renting and operating of own or leased real estate	T	Ignored as majority is non-maritime
68.31 Real estate agencies	T	Ignored as majority is non-maritime	

Value chain component	NACE code	Type (Primary, Secondary, Tertiary)	Comment
	81.10 Combined facilities support activities	T	Ignored as majority is non-maritime
	91.02 Museums activities	T	Ignored as majority is non-maritime
	91.03 Operation of historical sites and buildings and similar visitor attractions	T	Ignored as majority is non-maritime
	91.04 Botanical and zoological gardens and nature reserves activities	T	Ignored as majority is non-maritime
	93.11 Operation of sports facilities	T	Ignored as majority is non-maritime
	93.12 Activities of sport clubs	T	Ignored as majority is non-maritime
	93.13 Fitness facilities	T	Ignored as majority is non-maritime
	93.19 Other sports activities	T	Ignored as majority is non-maritime
	93.21 Activities of amusement parks and theme parks	S	Ignored as majority is non-maritime, and no data is available in Eurostat tables on this sector.
	93.29 Other amusement and recreation activities	S	Ignored as majority is non-maritime, and no data is available in Eurostat tables on this sector.
<b>Retail tourist activities provisioning</b>	?	T	Ignored as majority is non-maritime
<b>Transport</b>	49.10 Passenger rail transport, interurban	T	Ignored as majority is non-maritime and non-leisure
	49.31 Urban and suburban passenger land transport	T	Ignored as majority is non-maritime and non-leisure
	49.32 Taxi operation	T	Ignored as majority is non-maritime and non-leisure
	49.39 Other passenger land transport n.e.c.	T	Ignored as majority is non-maritime and non-leisure
	51.10 Passenger air transport	T	Ignored as majority is non-maritime and non-leisure
<b>Marketing</b>	?	T	Ignored as majority is non-maritime and non-leisure
<b>Finance</b>	?	T	Ignored as majority is non-maritime and non-leisure
<b>IT</b>	?	T	Ignored as majority is non-maritime and non-leisure
<b>Retail services</b>	?	?	Ignored as majority is non-

Value chain component	NACE code	Type (Primary, Secondary, Tertiary)	Comment
			maritime and non-leisure
<b>Construction</b>	41 Construction of buildings	T	Ignored. This activity was not part of the value chain described in the BG study. The whole construction sector has an impact on employment and GVA in the function which should not be underestimated. Nevertheless it is practically impossible to find proper keys to estimate the “true” size of these indicators depending on construction activities.
	42 Civil engineering	T	
	43 Specialised construction activities	T	

None of the identified NACE sectors qualifies as primary related to coastal tourism. The secondary sectors that relate to accommodation are included and require separation of maritime versus non-maritime accommodation. Travel service related secondary sectors are ignored.

#### Data collection

Eurostat statistical data on GVA and employment for the above-mentioned NACE codes are taken from the following location: [Link](#).

The data gathered are also included in part D (excel data file).

#### Allocation maritime/non-maritime

In the Blue Growth study, instead of using Eurostat data, we used the 2008 PRC report with figures from 2006 as a basis for estimations on employment in coastal tourism. These numbers might still be adaptable for estimations on the current size of the MEA, but will lose preciseness over time, as the 2008 PRC study is not annually replicated, while it also does not make clear the underlying data used. As the aim of the development of a methodology for this study is to provide an approach which is replicable over a longer time period we propose to use a key based on data regularly updated by Eurostat.

There are two potential keys to distinguish between maritime and non-maritime which could be used across all selected sectors:

- % of tourist nights spent in coastal NUTS-2 regions compared to the total – by Member State;
- % of beds available in coastal NUTS-3 regions.

While the second option (% of beds) is the geographically more precise one, the first option (% of nights spent) takes into account seasonality which has a large effect on employment in coastal regions. We therefore propose to use % of total nights spent in coastal NUTS-2 regions in collective tourist accommodation establishments. The problem with bed capacity is that it is stable over the year even though it does not reflect occupation rates of beds. If e.g. in many places accommodation in July and August is fully booked and much smaller numbers arrive throughout other periods of the

year, there is only staff needed for these two months.

Therefore, a combination of both datasets was applied, in order to calculate the estimated number of nights spent at NUTS-3 level, as follows:

- 1- Collect the number of nights spent in a given NUTS-2 region;
- 2- Collect the number of bed-places available for all the NUTS-3 regions within the given NUTS 2 region;
- 3- Attribute a number of nights spent at NUTS-3 level to each NUTS-2 region, based on the respective share on beds available;
- 4- Aggregate resulting “nights spent at NUTS 3” only for maritime NUTS 3

Eurostat provides a list of coastal NUTS3 regions annexed to [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Coastal\\_region\\_statistics](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Coastal_region_statistics) in excel form “Focus on coastal regions: tables and figures” also defining sea basin allocation of these regions. Our definition for “NUTS-2 coastal regions” is as follows:

“All NUTS-2 regions which cover at least one NUTS-3 coastal region”

Therefore:

- Landlocked NUTS 2 will not be taken into account;
- Landlocked NUTS 3 of coastal NUTS 2 will not be taken into account.

The whole operation should be repeated for every coastal NUTS 2 in the country. At the end of it, it will be possible to determine the share of nights spent in coastal region vs the share of night spent in the whole country. That share will be applied to the four NACE considered to determine the weight of coastal tourism over the national total

The approach can only be followed if the required information at both NUTS-2 and NUTS-3 level is available.

The data collected as well as the calculations to assign coastal regions and calculate nights spent are included in part D (excel data file).

### **Allocation to MEAs**

Not applicable.

### **Allocation to sea basins**

An allocation to sea basins was made using the NUTS-2 and NUTS-3 data as presented above, where each NUTS-2 and NUTS-3 region was assigned to one particular basin. For most NUTS-2 regions the relevant sea basin is obvious, with some exceptions (for instance Andalusia borders both the Mediterranean and the Atlantic. For those regions, the assignment as given by Eurostat was taken.

### **Country-specific adjustments**

#### **➤ Germany**

As certain data gaps occur on Eurostat (marked confidential) on a 4-digit level the use of the 2-digit NACE 2 code 55 Accommodation was used instead of data from all sub-categories (55.10, 55.20, 55.30, 55.90).

### Resulting figures

The resulting figures are included in part D (excel data file).

## 7.2 MEA 4.3 Cruise tourism

The approach to apply Eurostat data for estimating the size of this MEA was already elaborated under chapter 3 maritime transport. Results are included in part D (excel data file).



## 8 NACE sectors used and their definitions

The below table present an overview of the activities that are including under specific NACE codes. The descriptions are sourced from Eurostat.

**Table 8.1 Overview of definitions of NACE 2 sectors included in the estimations**

NACE	NAME	INCLUDES	EXCLUDES
03.11	Marine fishing	<ul style="list-style-type: none"> <li>fishing on a commercial basis in ocean and coastal waters</li> <li>taking of marine crustaceans and molluscs</li> <li>whale catching</li> <li>Taking of marine aquatic animals: turtles, sea squirts, tunicates, sea urchins etc.</li> <li>activities of vessels engaged both in marine fishing and in processing and preserving of fish</li> <li>gathering of other marine organisms and materials: natural pearls, sponges, coral and algae</li> </ul>	<ul style="list-style-type: none"> <li>capturing of marine mammals, except whales, e.g. walruses, seals, see 01.70</li> <li>processing of whales on factory ships, see 10.11</li> <li>processing of fish, crustaceans and molluscs on factory ships or in factories ashore, see 10.20</li> <li>renting of pleasure boats with crew for sea and coastal water transport (e.g. for fishing cruises), see 50.10</li> <li>fishing inspection, protection and patrol services, see 84.24</li> <li>fishing practiced for sport or recreation and related services, see 93.19</li> <li>operation of sport fishing preserves, see 93.19</li> </ul>
03.12	Freshwater fishing	<ul style="list-style-type: none"> <li>fishing on a commercial basis in inland waters</li> <li>taking of freshwater crustaceans and molluscs</li> <li>taking of freshwater aquatic animals</li> <li>gathering of freshwater materials</li> </ul>	<ul style="list-style-type: none"> <li>processing of fish, crustaceans and molluscs, see 10.20</li> <li>fishing inspection, protection and patrol services, see 84.24</li> <li>fishing practiced for sport or recreation and related services, see 93.19</li> <li>operation of sport fishing preserves, see 93.19</li> </ul>
06.10	Extraction of crude petroleum	<ul style="list-style-type: none"> <li>extraction of crude petroleum oils</li> <li>extraction of bituminous or oil shale and tar sand</li> <li>production of crude petroleum from bituminous shale and sand</li> <li>processes to obtain crude oils: decantation, desalting, dehydration, stabilisation etc.</li> </ul>	<ul style="list-style-type: none"> <li>support activities for oil and natural gas extraction, see 09.10</li> <li>oil and gas exploration, see 09.10</li> <li>manufacture of refined petroleum products, see 19.20</li> <li>recovery of liquefied petroleum gases in the refining of petroleum, see 19.20</li> <li>operation of pipelines, see 49.50</li> </ul>
06.20	Extraction of natural gas	<ul style="list-style-type: none"> <li>production of crude gaseous hydrocarbon (natural gas)</li> <li>extraction of condensates</li> <li>draining and separation of liquid hydrocarbon fractions</li> <li>gas desulphurisation</li> <li>mining of hydrocarbon liquids, obtained through liquefaction or pyrolysis</li> </ul>	<ul style="list-style-type: none"> <li>support activities for oil and natural gas extraction, see 09.10</li> <li>oil and gas exploration, see 09.10</li> <li>recovery of liquefied petroleum gases in the refining of petroleum, see 19.20</li> <li>manufacture of industrial gases, see 20.11</li> <li>operation of pipelines, see 49.50</li> </ul>
08.12	Operation of gravel and sand	<ul style="list-style-type: none"> <li>extraction and dredging of industrial sand, sand for construction and gravel</li> </ul>	<ul style="list-style-type: none"> <li>mining of bituminous sand, see 06.10</li> </ul>

NACE	NAME	INCLUDES	EXCLUDES
	pits; mining of clays and kaolin	<ul style="list-style-type: none"> <li>• breaking and crushing of gravel</li> <li>• quarrying of sand</li> <li>• mining of clays, refractory clays and kaolin</li> </ul>	
09.10	Support activities for petroleum and natural gas extraction	<ul style="list-style-type: none"> <li>• oil and gas extraction service activities provided on a fee or contract basis:</li> <li>• exploration services in connection with petroleum or gas extraction, e.g. traditional prospecting methods, such as making geological observations at prospective sites</li> <li>• directional drilling and redrilling; „spudding in“; derrick erection in situ, repairing and dismantling; cementing</li> <li>• Oil and gas well casings; pumping of wells; plugging and abandoning wells etc.</li> <li>• liquefaction and regasification of natural gas for purpose of transport, done at the mine site</li> <li>• draining and pumping services, on a fee or contract basis</li> <li>• test drilling in connection with petroleum or gas extraction</li> <li>• oil and gas field fire fighting services</li> </ul>	<ul style="list-style-type: none"> <li>• service activities performed by operators of oil or gas fields, see 06.10, 06.20</li> <li>• specialised repair of mining machinery, see 33.12</li> <li>• liquefaction and regasification of natural gas for purpose of transport, done off the mine site, see 52.21</li> <li>• geophysical, geologic and seismic surveying, see 71.12</li> </ul>
09.90	Support activities for other mining and quarrying	<ul style="list-style-type: none"> <li>• support services on a fee or contract basis, required for mining activities of divisions 05, 07 and 08</li> <li>• exploration services, e.g. traditional prospecting methods, such as taking core samples and making geological observations at prospective sites</li> <li>• draining and pumping services, on a fee or contract basis</li> <li>• test drilling and test hole boring</li> </ul>	<ul style="list-style-type: none"> <li>• operating mines or quarries on a contract or fee basis, see division 05, 07 or 08</li> <li>• specialised repair of mining machinery, see 33.12</li> <li>• geophysical surveying services, on a contract or fee basis, see 71.12</li> </ul>

NACE	NAME	INCLUDES	EXCLUDES
10.20	Processing and preserving of fish, crustaceans and molluscs	<ul style="list-style-type: none"> <li>preparation and preservation of fish, crustaceans and molluscs: freezing, deep-freezing, drying, cooking, smoking,</li> <li>Salting, immersing in brine, canning etc.</li> <li>Production of fish, crustacean and mollusc products: fish fillets, roes, caviar, caviar substitutes etc.</li> <li>production of fishmeal for human consumption or animal feed</li> <li>production of meals and soluble from fish and other aquatic animals unfit for human consumption</li> <li>activities of vessels engaged only in the processing and preserving of fish</li> <li>processing of seaweed</li> </ul>	<ul style="list-style-type: none"> <li>processing and preserving of fish on vessels engaged in fishing, see 03.11</li> <li>processing of whales on land or specialised vessels, see 10.11</li> <li>production of oils and fats from marine material, see 10.41</li> <li>manufacture of prepared frozen fish dishes, see 10.85</li> <li>manufacture of fish soups, see 10.89</li> </ul>
30.11	Building of ships and floating structures	<p>This class includes the building of ships, except vessels for sports or recreation, and the construction of floating structures:</p> <ul style="list-style-type: none"> <li>building of commercial vessels:</li> <li>Passenger vessels, ferry boats, cargo ships, tankers, tug etc.</li> <li>building of warships</li> <li>building of fishing boats and fish-processing factory vessels</li> <li>building of hovercraft (except recreation-type hovercraft)</li> <li>construction of drilling platforms, floating or submersible</li> <li>construction of floating structures:</li> <li>floating docks, pontoons, coffer-dams, floating landing stages, buoys, floating tanks, barges, lighters, floating</li> <li>cranes, non-recreational inflatable rafts etc.</li> <li>manufacture of sections for ships and floating structures</li> </ul>	<ul style="list-style-type: none"> <li>manufacture of parts of vessels, other than major hull assemblies:</li> <li>manufacture of sails, see 13.92</li> <li>manufacture of ships' propellers, see 25.99</li> <li>manufacture of iron or steel anchors, see 25.99</li> <li>manufacture of marine engines, see 28.11</li> <li>manufacture of navigational instruments, see 26.51</li> <li>manufacture of lighting equipment for ships, see 27.40</li> <li>manufacture of amphibious motor vehicles, see 29.10</li> <li>manufacture of inflatable boats or rafts for recreation, see 30.12</li> <li>specialised repair and maintenance of ships and floating structures, see 33.15</li> <li>ship-breaking, see 38.31</li> <li>interior installation of boats, see 43.3</li> </ul>
30.12	Building of pleasure and sporting boats	<p>This class includes:</p> <ul style="list-style-type: none"> <li>manufacture of inflatable boats and rafts</li> <li>building of sailboats with or without auxiliary motor</li> <li>building of motor boats</li> <li>building of recreation-type hovercraft</li> <li>manufacture of personal watercraft</li> <li>manufacture of other pleasure and sporting boats: canoes, kayaks, rowing boats, skiffs</li> </ul>	<p>This class excludes:</p> <ul style="list-style-type: none"> <li>manufacture of parts of pleasure and sporting boats: manufacture of sails, see 13.92, manufacture of iron or steel anchors, see 25.99, manufacture of marine engines, see 28.11</li> <li>manufacture of sailboards and surfboards, see 32.30</li> <li>maintenance and repair of pleasure boats, see 33.15</li> </ul>
33.15	Repair and	This class includes the repair and	<ul style="list-style-type: none"> <li>factory conversion of ships, see 30.1</li> </ul>

NACE	NAME	INCLUDES	EXCLUDES
	maintenance of ships and boats	<p>maintenance of ships and boats. However, the factory rebuilding or overhaul of ships is classified in division 30:</p> <ul style="list-style-type: none"> <li>• repair and routine maintenance of ships</li> <li>• repair and maintenance of pleasure boats</li> </ul>	<ul style="list-style-type: none"> <li>• repair of ship and boat engines, see 33.12</li> <li>• ship scrapping, dismantling, see 38.31</li> </ul>
42.91	Construction of water projects	<p>construction of:</p> <ul style="list-style-type: none"> <li>• Waterways harbour and river work, pleasure ports (marinas), locks, etc.</li> <li>• dams and dykes</li> <li>• dredging of waterways</li> </ul>	<ul style="list-style-type: none"> <li>• project management activities related to civil engineering works, see 71.12</li> </ul>
46.38	Wholesale of other food, including fish, crustaceans and molluscs	<ul style="list-style-type: none"> <li>• wholesale of feed for pet animals</li> </ul>	
47.23	Retail sale of fish, crustaceans and molluscs in specialised stores	<ul style="list-style-type: none"> <li>• retail sale of fish, other seafood and products thereof</li> </ul>	
50.10	Sea and coastal passenger water transport	<ul style="list-style-type: none"> <li>• transport of passengers over seas and coastal waters, whether scheduled or not:</li> <li>• operation of excursion, cruise or sightseeing boats</li> <li>• Operation of ferries, water taxis etc.</li> <li>• renting of pleasure boats with crew for sea and coastal water transport (e.g. for fishing cruises)</li> </ul>	<ul style="list-style-type: none"> <li>• restaurant and bar activities on board ships, when provided by separate units, see 56.10, 56.30</li> <li>• renting of pleasure boats and yachts without crew, see 77.21</li> <li>• renting of commercial ships or boats without crew, see 77.34</li> <li>• operation of "floating casinos", see 92.00</li> </ul>
50.20	Sea and coastal freight water transport	<ul style="list-style-type: none"> <li>• transport of freight over seas and coastal waters, whether scheduled or not</li> <li>• Transport by towing or pushing of barges, oil rigs etc.</li> <li>• renting of vessels with crew for sea and coastal freight water transport</li> </ul>	<ul style="list-style-type: none"> <li>• storage of freight, see 52.10</li> <li>• harbour operation and other auxiliary activities such as docking, pilotage, lighterage, vessel salvage, see 52.22</li> <li>• cargo handling, see 52.24</li> <li>• renting of commercial ships or boats without crew, see 77.34</li> </ul>
50.40	Inland freight water transport	<ul style="list-style-type: none"> <li>• transport of freight via rivers, canals, lakes and other inland waterways, including inside harbours and ports</li> <li>• renting of vessels with crew for inland freight water transport</li> </ul>	<ul style="list-style-type: none"> <li>• cargo handling, see 52.24</li> <li>• renting of commercial ships or boats without crew, see 77.34</li> </ul>

NACE	NAME	INCLUDES	EXCLUDES
52.10	Warehousing and storage	<ul style="list-style-type: none"> <li>operation of storage and warehouse facilities for all kinds of goods:</li> <li>Operation of grain silos, general merchandise warehouses, refrigerated warehouses, storage tanks etc.</li> <li>storage of goods in foreign trade zones</li> <li>blast freezing</li> </ul>	<ul style="list-style-type: none"> <li>parking facilities for motor vehicles, see 52.21</li> <li>operation of self storage facilities, see 68.20</li> <li>rental of vacant space, see 68.20</li> </ul>
52.22	Service activities incidental to water transportation	<ul style="list-style-type: none"> <li>activities related to water transport of passengers, animals or freight:</li> <li>operation of terminal facilities such as harbours and piers</li> <li>Operation of waterway locks etc.</li> <li>navigation, pilotage and berthing activities</li> <li>lighter age, salvage activities</li> <li>lighthouse activities</li> </ul>	<ul style="list-style-type: none"> <li>cargo handling, see 52.24</li> <li>operation of marinas, see 93.29</li> </ul>
52.24	Cargo handling	<ul style="list-style-type: none"> <li>loading and unloading of goods or passengers' luggage irrespective of the mode of transport used for transportation</li> <li>stevedoring</li> <li>loading and unloading of freight railway cars</li> </ul>	<ul style="list-style-type: none"> <li>operation of terminal facilities, see 52.21, 52.22 and 52.23</li> </ul>
55.10	Hotels and similar accommodation	<p>This class includes the provision of accommodation, typically on a daily or weekly basis, principally for short stays by visitors.</p> <p>This includes the provision of furnished accommodation in guest rooms and suites. Services include daily cleaning and bed-making. A range of additional services may be provided such as food and beverage services, parking, laundry services, swimming pools and exercise rooms, recreational facilities as well as conference and convention facilities.</p> <p>This class includes accommodation provided by:</p> <ul style="list-style-type: none"> <li>hotels</li> <li>resort hotels</li> <li>suite/apartment hotels</li> <li>motels</li> </ul>	<ul style="list-style-type: none"> <li>provision of homes and furnished or unfurnished flats or apartments for more permanent use, typically on a monthly or annual basis, see division 68</li> </ul>
55.20	Holiday and other short-stay accommodation	<p>This class includes the provision of accommodation, typically on a daily or weekly basis, principally for short stays by visitors, in self-contained space consisting of complete furnished rooms or areas for living/dining and sleeping, with cooking facilities or fully equipped</p>	<ul style="list-style-type: none"> <li>provision of furnished short-stay accommodation with daily cleaning, bed-making, food and beverage services, see 55.10</li> <li>provision of homes and furnished or unfurnished flats or apartments for more permanent use, typically on a</li> <li>monthly or annual basis, see division 68</li> </ul>

NACE	NAME	INCLUDES	EXCLUDES
		<p>kitchens. This may take the form of apartments or flats in small free-standing multi-storey buildings or clusters of buildings, or single storey bungalows, chalets, cottages and cabins. Very minimal complementary services, if any, are provided.</p> <p>This class includes accommodation provided by:</p> <ul style="list-style-type: none"> <li>• children and other holiday homes</li> <li>• visitor flats and bungalows</li> <li>• cottages and cabins without housekeeping services</li> <li>• youth hostels and mountain refuges</li> </ul>	
55.30	Camping grounds, recreational vehicle parks and trailer parks	<ul style="list-style-type: none"> <li>• provision of accommodation in campgrounds, trailer parks, recreational camps and fishing and hunting camps for short stay visitors</li> <li>• provision of space and facilities for recreational vehicles</li> </ul> <p>This class also includes accommodation provided by: protective shelters or plain bivouac facilities for placing tents and/or sleeping bags</p>	<ul style="list-style-type: none"> <li>• mountain refuge, cabins and hostels, see 55.20</li> </ul>
55.90	Other accommodation	<p>This class includes the provision temporary or longer-term accommodation in single or shared rooms or dormitories for students, migrant (seasonal) workers and other individuals.</p> <p>This class includes:</p> <ul style="list-style-type: none"> <li>• student residences</li> <li>• school dormitories</li> <li>• workers hostels</li> <li>• rooming and boarding houses</li> <li>• railway sleeping cars</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
77.34	Renting and leasing of water transport equipment	<ul style="list-style-type: none"> <li>• renting and operational leasing of water transport equipment without operator: commercial boats and ships</li> </ul>	<ul style="list-style-type: none"> <li>• renting of water-transport equipment with operator, see division 50</li> <li>• renting of pleasure boats, see 77.21</li> </ul>

## Part B: national statistics data approach

## 9 National Statistics

In addition to the methodology presented in part A above using Eurostat data, exactly the same approach was followed using national statistical agencies' data, under the assumption that these may contain more recent figures (2011 or 2012 instead of 2010), more complete (e.g. to solve data gaps observed in Eurostat), and possibly more detailed (e.g. regional level, sub-sector level – this can be seen in the case of Portugal below where 5-digit codes as 46.381 are presented).

To this end, an input sheet was made and country editors collected data from official national statistical sources on NACE 2 codes, i.e. the same codes as used for Eurostat. The following table shows as an example the data collected by the Portuguese country editor for GVA:

**Table 9.1** GVA (in € m) *Gross value added (€) of Enterprises by Economic activity (Subclass - CAE Rev. 3)*

NACE	2008	2009	2010	2011	2012
3.11	174.62	160.69	150.80	164.99	n/a
3.111	173.76	159.91	149.92	163.99	n/a
3.112	0.86	0.78	0.89	1.01	n/a
3.12	1.13	1.30	1.52	1.52	n/a
3.21	1.10	0.75	10.15	3.16	n/a
06.10	0.00	0.00	0.00	0.00	n/a
06.20	0.00	0.00	0.00	0.00	n/a
08.12	156.99	136.91	116.82	104.18	n/a
09.10	n/a	n/a	n/a	n/a	n/a
09.90	n/a	n/a	n/a	n/a	n/a
10.20	149.93	148.15	154.86	158.80	n/a
30.11	99.16	57.25	21.24	24.68	n/a
30.12	11.78	4.59	4.80	5.64	n/a
33.15	66.28	71.34	59.17	45.71	n/a
42.91	80.26	96.32	85.36	73.70	n/a
46.38	438.84	446.69	412.34	363.39	n/a
46.381	87.52	82.12	73.53	79.26	n/a
47.23	49.42	47.27	44.66	41.00	n/a
50.10	5.24	3.48	3.85	3.76	n/a
50.20	70.08	49.63	37.95	39.10	n/a
50.40	0.00	0.00	0.00	0.00	n/a
52.10	145.89	160.53	163.55	153.71	n/a
52.21	1,358.52	1,388.60	670.58	1,116.43	n/a
52.22	191.02	190.94	207.14	217.15	n/a
52.24	112.30	97.30	96.21	99.54	n/a
55.10	1,205.82	1,088.72	1,043.51	1,102.46	n/a
55.20	32.47	33.52	19.80	33.38	n/a
55.30	21.05	22.72	23.56	22.49	n/a
55.90	1.23	0.46	0.45	0.37	n/a
77.34	0.80	0.93	1.16	0.86	n/a



Data tables in published national statistics are not always filled. Therefore data related to the North Sea and Atlantic Arc could only be collected for France, Portugal, Spain, Belgium, Norway.

In addition to employment and GVA figures, where possible, country editors also gathered national statistical data for support data which was needed to estimate the size of MEAs. This data was even more difficult to acquire. Again the example of Portugal:

**Table 9.2 Example of Portugal on data collection from National Statistical Offices – various variables**

Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
Number of passengers on ships	Passengers transported (excl. Cruise) to/from main ports of the country		701,808	725157	767,765	n/a	n/a	n/a
	Country level - Passengers embarked and disembarked in all ports		735,486	762,137	832,561	n/a	n/a	n/a
Type of shipping	Share of short sea shipping in the country /		60.5	58.8	51.9	60.9	57.9	n/a
	Share of deep sea shipping in the country /		39.5	41.2	34	39.1	42.1	n/a
	Share unknown in the country /		0	0	14.1	0	0	n/a
Maritime Cargo	Share of Cargo handling which is maritime (assumed to be about 50%) in the country		36.68	39.6	42.2	n/a	n/a	n/a
Production value of type of fish	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
	PRCCODE 10201200 Fresh or chilled fish livers and roes - Fígados e ovas de peixe, frescos ou refrigerados		n/a	n/a	n/a	n/a	n/a	n/a
	PRCCODE 10201330 Frozen whole salt water fish - Peixe inteiro congelado de água salgada		n/a	60548125	68236695	78723911	74538300	85228230
	PRCCODE 10201360 Frozen whole fresh water fish - Peixes de água doce congelada		n/a	521942	346461	573860	687241	898155
	PRCCODE 10201400 Frozen fish fillets - Filetes de peixe congelados		n/a	4784193	3829713	4666907	4364365	3886966
	PRCCODE 10201500 Frozen fish meat without bones (excluding fillets) - Carne de peixe congelado sem osso (exceto os filés)		n/a	10954834	9568067	8555046	10171090	17070676
	PRCCODE 10201600 Frozen fish livers and roes - Fígados e ovas de peixe congelado		n/a	297318	176588	154531	147703	115145
	PRCCODE 10202100 Fish fillets, dried, salted or in brine, but not smoked		n/a	45082	78840	435707	1036339	128495

Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
	PRCCODE 10202200 Flours, meals and pellets of fish, fit for human consumption; fish livers and roes, dried, smoked, salted or in brine		n/a	n/a	n/a	n/a	n/a	n/a
	PRCCODE 10202300 Dried fish, whether or not salted; fish, salted but not dried; fish in brine (excluding fillets, smoked)		n/a	44323317	60067224	59830978	57590191	n/a
	PRCCODE 10202420 Smoked Pacific, Atlantic and Danube salmon (including fillets)		n/a	n/a	n/a	n/a	n/a	n/a
	PRCCODE 10202450 Smoked herrings (including fillets)		n/a	n/a	n/a	n/a	n/a	n/a
	PRCCODE 10202480 Smoked fish (including fillets) (excluding Pacific, Atlantic and Danube salmon, herrings)		n/a	37969	44923	24208	13004	n/a
	PRCCODE 10202510 Prepared or preserved salmon, whole or in pieces (excluding minced products and prepared meals and dishes)		n/a	n/a	n/a	n/a	n/a	n/a
	PRCCODE 10202520 Prepared or preserved herrings, whole or in pieces (excluding minced products and prepared meals and dishes)		n/a	72400	20700	n/a	n/a	n/a
	PRCCODE 10202530 Prepared or preserved sardines, sardinella, brisling and sprats, whole or in pieces (excluding minced products and prepared meals and dishes)		n/a	22035559	17612217	19375698	19048590	13849150
	PRCCODE 10202540 Prepared or preserved tuna, skipjack and Atlantic bonito, whole or in pieces (excluding minced products and prepared meals and dishes)		n/a	14071691	16773268	14575787	17022479	15548323
	PRCCODE 10202550 Prepared or preserved mackerel, whole or in pieces (excluding minced products and		n/a	7864315	6237612	7674124	7492216	8465812

Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
	prepared meals and dishes)							
	PRCCODE 10202560 Prepared or preserved anchovies, whole or in pieces (excluding minced products and prepared meals and dishes)		n/a	40506	38771	64371	35373	n/a
	PRCCODE 10202570 Fish fillets in batter or breadcrumbs including fish fingers (excluding prepared meals and dishes)		n/a	21747	83733	n/a	75885	52128
	PRCCODE 10202580 Other prepared or preserved fish, whole or in pieces (excluding minced products and prepared meals and dishes)		n/a	475876	690796	499609	417033	276205
	PRCCODE 10202590 Prepared or preserved fish (excluding whole or in pieces and prepared meals and dishes)		n/a	5361480	4703805	4931385	5647432	5404291
	PRCCODE 10202630 Caviar (sturgeon roe)		n/a	n/a	n/a	n/a	n/a	n/a
	PRCCODE 10202660 Caviar substitutes		n/a	n/a	n/a	n/a	n/a	n/a
	PRCCODE 10203100 Frozen crustaceans, frozen flours, meals and pellets of crustaceans, fit for human consumption		n/a	8816042	4374128	4901787	4334455	6499251
	PRCCODE 10203200 Molluscs (scallops, mussels, cuttle fish, squid and octopus), frozen, dried, smoked, salted or in brine		n/a	12080475	12257410	9952001	9063256	9851835
	PRCCODE 10203300 Other aquatic invertebrates (striped venus, jellyfish, etc), frozen, dried, smoked, salted or in brine; flours, meals and pellets of aquatic invertebrates other than crustaceans, fit for human consumption, frozen, dried, smoked, salted or in brine		n/a	1796858	1650999	1524270	691749	691541

Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
	PRCCODE 10203400 Prepared or preserved crustaceans, molluscs and other aquatic invertebrates (excluding chilled, frozen, dried, salted or in brine, crustaceans, in shell, cooked by steaming or boiling) (excluding prepared meals and dishes) - Crustáceos, moluscos e outros invertebrados aquáticos (excluindo refrigerados, congelados, secos, salgados ou em salmoura, crustáceos com casca, cozidos em água ou vapor) (excepto refeições e pratos preparados), preparados ou conservados		n/a	5279745	6150423	5868539	5691211	11162848
	PRCCODE 10204100 Flours, meals and pellets of fish or of crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption - Farinhas, pós e pellets de peixes ou crustáceos, moluscos e outros invertebrados aquáticos, impróprios para consumo humano		n/a	1710504	3036583	4844949	4810913	4286787
	PRCCODE 10204200 Inedible fish products (including fish waste; excluding whalebone and whalebone hair, coral and similar materials, shells and cuttle-bone, unworked or simply prepared/natural sponges) - Produtos não comestíveis de peixe (incluindo resíduos de peixe, excluindo franjas e franjas, materiais de corais e similares, conchas e ossos de choccos, esponjas em bruto ou simplesmente preparados, / naturais)		n/a	1799728	1622078	4508960	8395746	6116394
Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
Data on fishing	GVA in million euro		166439660	173762257	159911724	149915503	163987838	n/a
	number of persons employed in fishing		11989	12039	11473	11063	11178	n/a

Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
Marine aquatic products	marine (number of persons employed)							
	marine (GVA in million euro)							
	shellfish (number of persons employed)		334	355	361	376	348	n/a
	shellfish (GVA in million euro)		747588	856572	782607	888840	1005687	n/a
Agricultural accounts according to EAA 97 Rev.1.1 by NUTS 2 regions	Labour force: number of persons employed and farm work (AWU) in each of the NUTS 2 regions	<i>Norte</i>	171.1	167.7	164.2	149.5	144.2	n/a
		<i>Centro</i>	140.6	138.9	137.2	125	120.6	n/a
		<i>Lisboa</i>	13.1	12.3	11	10.3	9.9	n/a
		<i>Alentejo</i>	52.1	50.6	50	47.6	45.8	n/a
		<i>Algarve</i>	14.1	13.4	12.5	11.5	11.1	n/a
		<i>RA dos Açores</i>	14.1	13.6	12.7	11.6	11.1	n/a
		<i>RA da Madeira</i>	11.1	13.3	15.9	14.5	14	n/a
	Production value at basic price by each NUTS 2 region	<i>Norte</i>	1387.6	1413.4	1336.3	1368.5	1345.7	n/a
		<i>Centro</i>	1942.3	2014.5	1983.8	1962	1993.8	n/a
		<i>Lisboa</i>	430	442.8	418.2	430.7	397.2	n/a
		<i>Alentejo</i>	1584.8	1693	1581.4	1719.9	1696.3	n/a
		<i>Algarve</i>	285.5	303.9	255.6	289.1	265.7	n/a
		<i>RA dos Açores</i>	349.2	371.4	368.2	367.6	393.4	n/a
	<i>RA da Madeira</i>	87.7	91.6	87.8	94.1	95.1	n/a	
EU soils	Total agricultural area (1000 ha) in the country		3472.847	n/a	n/a	n/a	n/a	n/a
	Saline soils area (1000 ha) in the country							
	Agricultural area on saline soils (1000 ha) in the country		1.537	1.579	1.409	1.209	1.195	n/a
Oil and gas production in 1 000	Primary production of crude oil in 1000 tonnes of oil in the country		6281	4721	4721	n/a	n/a	n/a
	Primary production of natural gas in 1000 tonnes of oil		0	0	0	0	0	0

Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
tonnes of oil equivalent	equivalent in the country							
	offshore oil production in 1000 tonnes of oil							
	offshore gas production in 1000 tonnes of oil equivalent							
Offshore share marine aggregates	Total aggregates in million tons							
Tourism indicators	Number of bedrooms and bed-places by each NUTS 3 region in Hotels and similar establishments in the country	<i>Minho-Lima</i>	4,057	4,989	4,104	n/a	n/a	n/a
		<i>Cávado</i>	4,722	4,966	4,958	n/a	n/a	n/a
		<i>Ave</i>	2,399	2,475	2,484	n/a	n/a	n/a
		<i>Grande Porto</i>	16,620	17,455	18,257	n/a	n/a	n/a
		<i>Tâmega</i>	1,316	1,546	1,480	n/a	n/a	n/a
		<i>Entre Douro e Vouga</i>	880	1,060	1,174	n/a	n/a	n/a
		<i>Douro</i>	2,338	2,313	2,304	n/a	n/a	n/a
		<i>Alto Trás-os-Montes</i>	4,089	4,013	4,066	n/a	n/a	n/a
		<i>Baixo Vouga</i>	4,881	4,939	4,881	n/a	n/a	n/a
		<i>Baixo Mondego</i>	5,011	4,966	5,087	n/a	n/a	n/a
		<i>Pinhal Litoral</i>	3,469	3,474	3,482	n/a	n/a	n/a
		<i>Pinhal Interior Norte</i>	640	633	671	n/a	n/a	n/a
		<i>Dão-Lafões</i>	4,370	4,691	4,531	n/a	n/a	n/a
		<i>Pinhal Interior Sul</i>	198	381	332	n/a	n/a	n/a
		<i>Serra da Estrela</i>	507	407	431	n/a	n/a	n/a
<i>Beira Interior</i>	1,690	1,661	1,661	n/a	n/a	n/a		

Category	Indicator needed	NUTS	2007	2008	2009	2010	2011	2012
		<i>Norte</i>						
		<i>Beira Interior Sul</i>	1,384	1,380	1,337	n/a	n/a	n/a
		<i>Cova da Beira</i>	1,830	1,992	1,970	n/a	n/a	n/a
		<i>Oeste</i>	5,952	6,571	6,828	n/a	n/a	n/a
		<i>Médio Tejo</i>	6,905	7,053	7,394	n/a	n/a	n/a
		<i>Grande Lisboa</i>	45,255	45,812	46,870	n/a	n/a	n/a
		<i>Península de Setúbal</i>	4,399	5,304	5,171	n/a	n/a	n/a
		<i>Alentejo Litoral</i>	2,723	2,691	3,211	n/a	n/a	n/a
		<i>Alto Alentejo</i>	1,813	1,951	1,950	n/a	n/a	n/a
		<i>Alentejo Central</i>	2,790	2,801	2,885	n/a	n/a	n/a
		<i>Baixo Alentejo</i>	1,478	1,410	1,432	n/a	n/a	n/a
		<i>Lezíria do Tejo</i>	1,157	1,155	1,113	n/a	n/a	n/a
		<i>Algarve</i>	96,180	98,724	95,910	n/a	n/a	n/a
		<i>RA dos Açores</i>	8,397	8,662	8,806	n/a	n/a	n/a
		<i>RA da Madeira</i>	27,297	28,500	29,024	n/a	n/a	n/a
	Number of nights spent in touristic accommodation establishments by each NUTS 2 region in the country	<i>Norte</i>	4,228,965	4,250,764	4,269,967	n/a	n/a	n/a
		<i>Centro</i>	3,851,235	3,880,275	3,747,517	n/a	n/a	n/a
		<i>Lisboa</i>	8,679,040	8,410,405	7,905,937	n/a	n/a	n/a
		<i>Alentejo</i>	1,098,569	1,085,673	1,104,315	n/a	n/a	n/a
		<i>Algarve</i>	14,704,384	14,265,164	12,927,603	n/a	n/a	n/a
		<i>RA dos Açores</i>	1,184,375	1,127,513	1,004,804	n/a	n/a	n/a
		<i>RA da Madeira</i>	5,990,015	6,208,144	5,496,926	n/a	n/a	n/a



What we can see in general is that **most figures collected from national statistical agencies show the same or at least very similar data as the Eurostat figures**. This is what one would expect as national statistical agencies are the ones providing Eurostat with the national data. Deviations can occur in the level of precision (e.g. 5-digit codes), more actual data (e.g. national statistical data were corrected, but not updated in Eurostat) and more recent data (data available for more recent years than provided in Eurostat). The higher level of precision is especially of interest if (as in the case of France) it provides a split between maritime and non-maritime cargo. The data corrections usually do not have a large impact on the outcome of calculations as they mainly happen on a minor level. The up-to-dateness appears at a first moment very promising, but in reality does not provide more recent outcomes for our calculations as it is not available for all data needed (e.g. NACE data is available for 2011, but support data to allocate shares of NACE codes is not available).

The national statistics agencies' data were then processed to make the same calculations as done for the Eurostat based data as explained in part A above. **As also the national input data was incomplete we did not completely separate the two datasets, but updated the Eurostat dataset with national statistics where possible**. This means in practice that where possible we replaced the Eurostat figure by the figure from national statistics if that provided better information. Where not possible, but a Eurostat figure available, we kept this figure in the calculations.

The results are given in part D (excel data file).

Therefore, the main conclusion is that the collection of national statistical data provided help in certain specific cases, but has not helped to fill the data gaps identified..

In the following we describe outputs of calculations based on national statistics. We only describe those sectors that are sufficiently well covered in statistics (see chapter 2, table 2.1; left column).

## 0 General, other sectors

### *MEA 0.1 Shipbuilding*

When updating (replacing Eurostat where national data could be accessed by country editors) calculations with Spanish data from the national statistical agency, estimated results are (especially for GVA) significantly lower than solely Eurostat based calculations. Other countries which provide national official data (Portugal, France or Norway) show only slight differences<sup>21</sup>. These differences might be due to later corrections of the already submitted data.

At the same time these data were also gathered from national statistical agencies. This has shown that for several countries, national statistical agencies publish less or less detailed data than Eurostat. Hence, the data gaps identified in Eurostat could not be filled from national statistics.

### *MEA 0.2 Water projects*

Calculations based on updated national statistics data (where possible) show slight deviations, but these remain for this MEA very small.

---

<sup>21</sup> As shown in the comparison table in part D (excel data file)

## 1. Maritime transport –

### *MEAs 1.1 – 1.4*

In this section no major deviations are visible. The biggest difference is in France where MEAs 1.1 and 1.2 and 1.4 are higher using national statistics, but 1.3 is lower. In the case of Portugal differences occur in 1.3 where national data shows lower estimates. In Spain 1.4 is higher when using national statistics.

## 2. Food, nutrition, health and eco-system services

In Spain and Portugal national statistical data leads to a different allocation. In the case of Spain 2.1 is higher in national statistics than in Eurostat and for 2.2 the other way around. In Portugal it is the opposite case.

## 3. Energy & raw materials

Results are similar or the same as Eurostat.

## 4. Coastal & maritime tourism

### *MEA 4.1 Coastal tourism*

Spanish national statistics led to higher estimates in coastal tourism. Slightly higher estimates based on national statistics in Portugal. In the French case there is higher GVA and lower employment when using national statistics.

### *MEA 4.3 Cruise tourism*

Results are similar or the same as Eurostat.

## Part C: Alternative sources

As explained in chapter 1 (methodology overview), for a number of MEA, no correspondence with NACE sectors could be made, and thus alternative sources are needed to estimate their size and growth. These MEAs are:

**Table 10.1** Functions and reflecting MEAs

Function	MEA
2. Food, aquaculture	2.4 Blue biotechnology
3. Energy & raw materials	3.2 Offshore wind
	3.3 Ocean renewable energy sources
	3.4 Carbon Capture & Storage
	3.6 Marine mineral resources
	3.7 Securing fresh water supply (Desalination)
4. Coastal & maritime tourism	4.2 Yachting and marinas
5. Coastal protection	5.1+5.2+5.3 Coastal protection
6. Monitoring & surveillance	6.1+6.2 Maritime security
	6.3 Environmental monitoring

The alternative sources used for a particular MEA may vary between countries. The sources found are included in the comparison overview table which is included in part D (excel data file). Generally, no detailed calculations or assumptions were made, but those already made in the studies, reports and market estimates found were taken. Therefore this section only gives a general description of the MEAs' understanding but no detailed calculation approaches.

### MEA 2.4 Blue biotechnology

Blue biotechnology is an “umbrella term” that covers all possible applications of technology and science to living organisms of the sea. It is therefore very difficult to define the limits of the sector, especially taking into account that it affects several different fields, e.g.:

- Foods
- Nutraceuticals
- Medicine
- Healthcare
- Cosmetics
- Research tools
- Processing technology
- New energy sources
- Agriculture
- Industry
- Food safety
- Environment enhancement

It is not possible to establish direct links to NACE codes.

No data are available through Eurostat or other international sources. A revision of industry codings would need to be undertaken in order to take into account the weight of blue biotechnology of each of the above sectors. At present it is impossible to find a single source providing data by MS on the GVA and employment in the blue biotechnology sector, nor does it seem realistic to calculate reliable proxies.

The only possible solution was to investigate whether specific studies and/or reports exist at the national level, with data on GVA and employment, or with some useful proxies. In this respect reference is made to the individual country reports.

## MEA 3.2 Offshore wind

### Value chain

Offshore wind energy refers to wind farms in marine waters, and the conversion of wind energy into electricity. The advantage of constructing these parks offshore is that the wind speeds are higher, and that there is less competition for space with other user functions than on land (though competition is far from absent). Additionally, the more uniform wind speeds mean less wear and tear for the turbines. On the other hand, the offshore environment is harsher and more difficult than on land, due to the high wind speeds, waves and the salty environment. This increases the relative risks, as well as the costs of exploring and developing the necessary technology.<sup>22</sup>

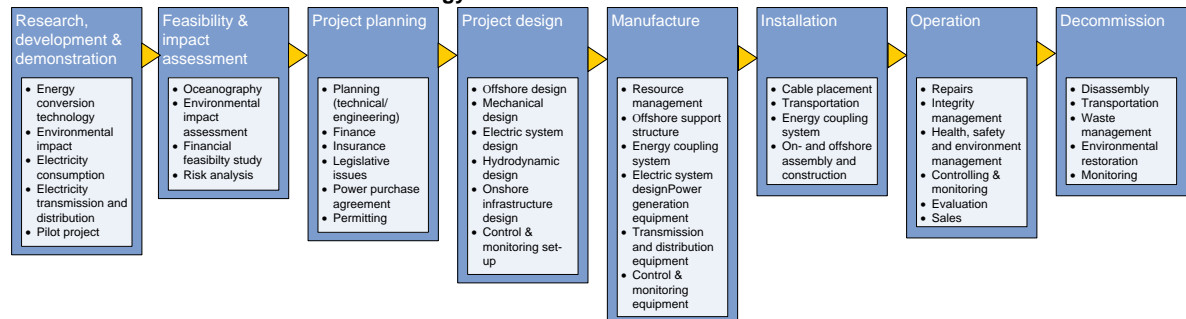
So far, offshore wind is the cheapest, and most mature of the offshore renewable energy technologies. It has been the front-runner since the 1990s. Various types of foundations have been developed to cope with the differing water depths and seabed conditions that these offshore wind farms have to cope with.<sup>23</sup>

Although offshore wind energy is the most developed of the offshore renewable technologies, it is still an industry in its infancy. There are enough facets which are as yet undiscovered, making it an intriguing and potentially profitable area for new ventures.<sup>24</sup>

In the value chain, all relevant elements and activities in the whole sector of offshore wind energy are depicted. The value chain as portrayed in the Blue Growth study sub-function report roughly coincides with the life-cycle of the technology:

Figure 0.1

### General value chain for offshore wind energy



Source: Ecorys (2011): Maritime Sub-Function Profile Offshore Wind Energy

<sup>22</sup>Ecorys (2011): Maritime Sub-Function Profile Offshore Wind Energy

<sup>23</sup>Ecorys (2011): Maritime Sub-Function Profile Offshore Wind Energy

<sup>24</sup>Ecorys (2011): Maritime Sub-Function Profile Offshore Wind Energy

Given the still limited capacity we propose to focus on the core elements of the value chain:

- Production of parts
- Construction
  - Grid
  - Power plant
- Operation

### **Corresponding NACE sectors**

Linking value chain components to NACE codes for offshore wind energy is very difficult. There are no NACE codes explicitly covering offshore wind. Codes like 28.11 Manufacture of engines and turbines, except aircraft, vehicle and cycle engines definitely cover also the production of turbines for offshore wind energy farms, but the share is unknown. Similar for 42.22 Construction of utility projects for electricity and telecommunications which includes the construction of offshore wind farms and 35.11 Production of electricity, 35.12 Transmission of electricity, 35.13 distribution of electricity, 35.14 Trade of electricity, which includes trade of offshore wind energy. Furthermore the activity is limited to few countries and key players.

Therefore, the use of NACE based statistical data was considered not feasible, and use was made of alternative sources of data, notably EU covering publications from sector agencies like EWEA.

### **Data collection**

Data was gathered from various sources at national and EU level. See the country fiches for data sources used. Data is also included in part D (excel data file).

### **Allocation maritime/non-maritime**

Not applicable

### **Allocation to MEAs**

Not applicable

### **Allocation to sea basins**

Based on either the specific sources found (if they gave this) or on judgment from the country experts.

### **Country-specific adjustments**

Not applicable

### **Resulting figures**

See part D (excel data file).

## **MEA 3.3 Ocean renewable energy sources**

### **Value chain**

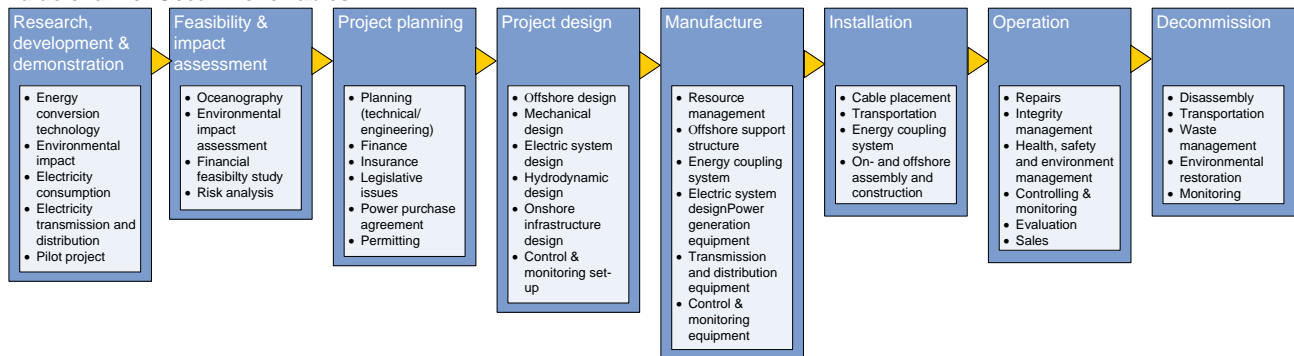
The MEA ocean renewable energy represents not one single technology. It consists of four types of technologies which are split in various sub-technologies. The four types are: wave, tidal, OTEC, osmotic. Given the low maturity of the development of this MEA, it does not yet exist in a large scale.

Nevertheless, for the wave and tidal sector, a large number of devices are under development across Europe. So far, no particular design has emerged as clear front runner for large scale commercial development. The various technologies are at different stages of development with some prototypes currently being tested at full scale and commercial projects expected in the near future. For OTEC and osmotic power, a limited number of projects are currently being developed with again no clear technological development in sight.<sup>25</sup>

What we presented as a value chain in the sub-function report should be better defined as a life-cycle:

**Table 0.2**

**Value chain of Ocean Renewables**



Source: Maritime Sub-Function Profile Report 3.3 "Ocean Renewable Energy Sources"

Given the early stage of the development we suggest to focus on four core VGAs of this MEA:

- R&D
- Production of parts
- Construction
  - Grid
  - Power plant
- Operation

**Corresponding NACE sectors**

The points mentioned under offshore wind apply to ocean renewable energy as well, and as this sector is much less developed yet, even less visibility under existing statistical entries is expected. Therefore no NACE based statistical data have been used, but alternative sources gathered.

**Data collection**

Data was gathered from various sources at national and EU level. See the country fiches for data sources used.

**Allocation maritime/non-maritime**

Not applicable

**Allocation to MEAs**

Not applicable

### **Allocation to sea basins**

Ocean renewable energy is so far limited to very few sites. It can therefore be allocated to the sea basins according to its installation location based on national data or expert opinions.

### **Country-specific adjustments**

Not applicable

### **Resulting figures**

See part D (excel data file).

## **MEA 3.4 Carbon Capture and Storage**

### **Value chain**

Carbon capture and storage is a technology to capture and store CO<sub>2</sub> released during the burning of fossil fuels, or as a result of industrial processes such as making cement, steel or in the chemical industry. There is already considerable experience with injecting carbon dioxide deep underground for storage at a number of industrial-scale CCS projects.<sup>26</sup>

The purpose of this technology is to mitigate the contribution to Climate change of carbon intensive industries.

CCS is still in its development stage. There are many reasons to expect it to become a successful technology, but so far it has not been put in place in many occasions. The core parts of the value chain for CCS consist of the production of the CCS technology, the installation and the maintenance.

### **NACE correspondence**

As the technology is so immature it is practically impossible to allocate it to NACE codes. We therefore propose to either drop it when quantifying the maritime sector or rely on national sources or on bottom-up specific studies (as per the BG study).

### **Data collection**

Data was gathered from various sources at national and EU level. See the country fiches for data sources used.

### **Allocation maritime/non-maritime**

Not applicable

### **Allocation to MEAs**

Not applicable

### **Allocation to sea basins**

CCS is only very small at the moment and no clear allocation between sea basins can be made, other than on the basis of expert opinions.

### **Country-specific adjustments**

Not applicable

---

<sup>26</sup> CSS Association: <http://www.ccsassociation.org>

## Resulting figures

See part D (excel data file).

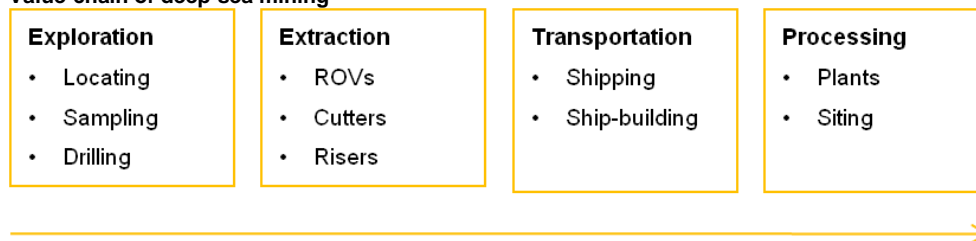
## MEA 3.6 Marine mineral resources

### Value chain

Marine mineral resources in this paper are (based on the BG study) understood as all raw materials found on and under the seabed, excluding fossil fuels (oil, gas and methane hydrates), phosphorates, and renewable energy sources such as seafloor hot-springs. We also exclude aggregate mineral resources such as sand, gravel and crushed rock which are part of MEA 3.5 Aggregates mining.<sup>27</sup>

The deposits of marine minerals can be divided into three categories: (1) polymetallic sulphurs, (2) ferromanganese crusts,(3) (ferro)manganese nodules, and (4) rare earth elements and yttrium, and. They differ in composition, shape and location.<sup>28</sup>

Figure 0.2 Value-chain of deep-sea mining



Source: Based on Birney et al. (2006)

The value-chain of deep-sea mining as described in the sub-function report consists of four main steps:

1. In the **Exploration phase**, different techniques for locating and testing ore content and quality is carried out through locating, sampling and drilling,
2. In the **Extraction phase**, ROVs, cutters and risers are used to carry the ore from the bottom up to the surface,
3. In the **Transportation phase**, shipping and ship-building is in focus; and finally,
4. In the **Processing phase**, the extraction of minerals in plants is carried out. Here also the site plays a key role.<sup>29</sup>

### Corresponding NACE sectors

Linking the components of the marine minerals mining value chain to NACE codes is very difficult as the sector is still very small and not defined by single NACE codes. We therefore did to rely on NACE codes but on alternative data if available, in particular sector specific studies possibly at MS level (as per the BG study).

<sup>27</sup> Ecorys (2011): Blue Growth Scenarios and Drivers for Sustainable Growth from the Oceans, Seas and Coasts "Marine mineral resources"

<sup>28</sup> Ecorys (2011): Blue Growth Scenarios and Drivers for Sustainable Growth from the Oceans, Seas and Coasts "Marine mineral resources"

<sup>29</sup> Ecorys (2011): Blue Growth Scenarios and Drivers for Sustainable Growth from the Oceans, Seas and Coasts "Marine mineral resources"



### Data collection

Data was gathered from various sources at national and EU level. See the country fiches for data sources used. Those are also included in part D (excel data file).

### Allocation maritime/non-maritime

Not applicable

### Allocation to MEAs

Not applicable

### Allocation to sea basins

Not applicable

### Country-specific adjustments

Not applicable

### Resulting figures

See part D (excel data file).

## MEA 3.7 Fresh water supply (desalination)

### Value chain

Traditional desalination processes are based on thermal processes, using vacuum distillation (boiling of water at low pressure). A major technique used in this respect is multi-stage flash (MSF) distillation. The principal competing technique at this moment uses semi-permeable membranes and pressure to separate salts from water, this is called reverse osmosis. Reverse osmosis plant membrane systems use less energy than thermal distillation. The share of the thermal market has fallen due to a growth of membrane markets. At this moment, the market share of reverse osmosis is 61% and that of multi stage flash distillation 26%.<sup>30</sup>

Desalination has a relatively limited value chain, as it mainly involves the manufacturing of fresh water out of marine resources. This has subsequently to be distributed through regular utility companies. The biggest share in cost of the entire plant is its manufacture. The cost of converting seawater to fresh water has been influenced mainly by the energy cost and production cost. It is followed by operation and maintenance<sup>31</sup>.

### Corresponding NACE sectors

The MEA is of very small scale and therefore difficult to be linked to NACE sectors. There is one code specifically mentioning “desalting of sea or ground water to produce water as the principal product of interest”, 36.00 Water collection, treatment and supply. The problem is that this code also covers the collection of rain water, the purification of water for water supply purpose, the treatment of water for industrial and other purposes, the distribution of water through mains, by

---

<sup>30</sup> Ecorys (2011): Blue Growth

Scenarios and Drivers for Sustainable Growth from the Oceans, Seas and Coasts Maritime Sub-Function Profile “Securing Fresh Water Supply (Desalination)”

<sup>31</sup> [www.hkc22.com/waterdesalination.html](http://www.hkc22.com/waterdesalination.html), quote in Ecorys (2011): Blue Growth

Scenarios and Drivers for Sustainable Growth from the Oceans, Seas and Coasts Maritime Sub-Function Profile “Securing Fresh Water Supply (Desalination)”

trucks or other means and the operation of irrigation canals. Therefore the share of desalination is expected to be very low.

#### **Data collection**

Eurostat statistical data on GVA and employment for the above-mentioned NACE code was taken from Global Insights (2010).

#### **Allocation maritime/non-maritime**

The method chosen to estimate this MEA has been based on data provided by the Global Water Intelligence in their “Global Water Market 2011” report on the capacity of desalination. The share of sea water and brackish water desalination as compared to the total drinking water utility capex reported therein was taken as a proxy for the share of NACE 36.00 that can be considered seawater desalination. This ratio was subsequently used to calculate the GVA and employment of this MEA.

#### **Allocation to MEAs**

Not applicable

#### **Allocation to sea basins**

Based on expert views from country experts.

#### **Country-specific adjustments**

Not applicable.

#### **Resulting figures**

Resulting figures as well as underlying data and calculations are included in part D (excel data file).

### **MEA 4.2 Yachting and marinas (maritime tourism)**

#### **Value chain**

This MEA is strongly interlinked with 4.1 Coastal tourism. It can be defined as coastal tourism including the use of yachts and other pleasure boats excluding cruise.

The value chain for yachting and marinas contains sectors such as:

- Yacht building
- Port services and logistics, e.g. energy supply, waste water etc. in marinas
- Maritime works – constructing marinas, maintaining access channels
- Service sectors like hotels & restaurants, landside logistics & transport.

#### **Corresponding NACE sectors**

The following table provides the link between core activities and NACE codes.

**Table 0.3 Nace codes reflecting yachting and marinas**

VGA	NACE code	Type (Primary, Secondary, Tertiary)	Comments
Shipbuilding and marine equipment	30.12 Building of pleasure and sporting boats	P	Already included in 0.1 Shipbuilding
	33.11 Repair and maintenance of ships and boats	P	Already included in 0.1 Shipbuilding
Port services and logistics	52.22 Service activities incidental to water transportation	P	Already included in MEAs on maritime transport
Maritime works – constructing ports, maintaining access channels	42.91 Construction of water projects	P	Already included in 0.2 Water projects
Accommodation	Various under NACE 55 at coastal regions (NUTS) level	S	Already included in 4.1 coastal tourism

The above implies that the main components are already covered through other MEA.

Instead, to give an impression of the size/importance of this MEA, data was obtained from ICOMIA, who publishes data on yacht and leisure boat building.

#### Data collection

Data was gathered from various sources at national and EU level. See the country fiches for data sources used. The data are also included in part D (excel data file).

#### Allocation maritime/non-maritime

Not applicable

#### Allocation to MEAs

Not applicable

#### Allocation to sea basins

To allocate yachting and marinas to sea basins, the number of marinas per sea basin is used as a proxy.

#### Country-specific adjustments

Not applicable

#### Resulting figures

Resulting figures as well as underlying data and calculations are included in part D (excel data file).

## MEA 5.1 Coastal protection

Under function 5, initially three MEA were defined in the Blue Growth study:

- 5.1 Protection against flooding and erosion
- 5.2 Preventing salt water intrusion
- 5.3 Protection of habitats

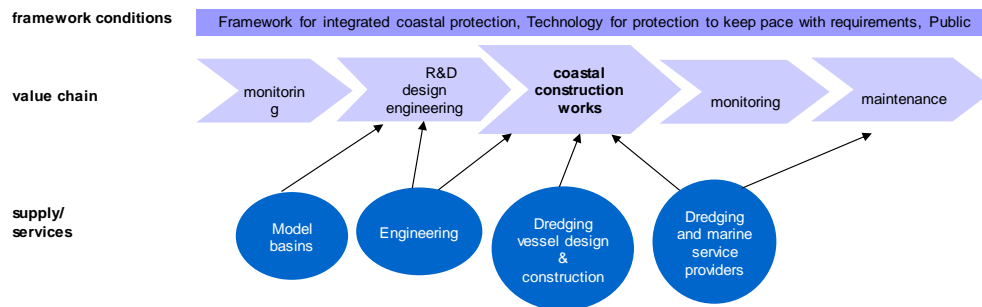
However already in the Blue Growth study it was concluded that the economic activities within these MEA strongly overlap and no clear separation with regard to size and growth could be made. Hence the three have been assessed in further detail as if they are one MEA, and this approach is followed here as well.

### Definition of the Maritime Economic Activity

Definition of the combined MEA: in the sub-function report, this is phrased as follows: “Coastal protection against flooding and erosion may be considered not as an economic sub-function like other maritime sub-functions, but rather as a condition sine qua non for the use of coastal areas and for allowing other functions to flourish. Risk of flooding and erosion threatens the performance of other maritime functions, and may even cause loss of life and of assets; coastal protection settles this threat.”<sup>32</sup>

### Description of the value chain

The value chain of this MEA was depicted (in the BG study) as follows.



While the value chain picture in fact describes the coastal protection processes, the main economic sectors relevant to this MEA are depicted under the supply/services

### Linking the value chain components to NACE sectors

The value chain as depicted above only allows the linking of part of the value chain components to NACE sectors. See below table.

**Table 0.4** Link of value chain components to NACE sectors

Value chain component	NACE Rev.2 sector(s) relevant	Comments/explanation
Model basins	71.20 Technical testing and analysis	This relates to almost all MEA + large part is non-maritime. Proposed to disregard.
Engineering	71.12 Engineering activities and related technical consultancy	This relates to almost all MEA + large part is non-maritime. Proposed to disregard.

Value chain component	NACE Rev.2 sector(s) relevant	Comments/explanation
Vessel design & construction	30.11 Building of ships and floating structures	This relates to almost all MEA. Disregarded here but addressed under 'other sectors' in MEA 0.1 Shipbuilding.
Construction works	42.91 Construction of water projects	This relates to almost all MEA + part is non-maritime. Disregard here but addressed under 'other sectors'. In MEA 0.2 Water projects
Dredging and marine service providers	idem	Idem (MEA 0.2)
	33.15 Repair and maintenance of ships and boats	This relates to all MEA. Disregard here but addressed under 'other sectors'. (MEA 0.1)

From the table above it is clear that none of the NACE sectors are very directly linked to this particular MEA. Moreover a number of sectors are largely non-maritime. As it is virtually impossible to assess which share of the above sectors would relate to coastal protection, and as several of them will therefore be addressed separately, the estimation of this MEA will rely on alternative sources outside Eurostat.

In the Blue Growth study, because of these reasons, instead of estimating the shares of the respective NACE codes relevant to this MEA, a bottom-up approach was followed, from two angles:

- Public expenses by MS for coastal protection works – this was taken from a study made in 2009.<sup>33</sup> Data in that study were gathered from national budgets where expenses for coastal works were specified.
- Turnover from major marine contractors. As coastal protection works are generally performed by marine construction companies, mainly dredger firms, and this sector is highly concentrated with 4 players dominating the market having some 80 % market share (Van Oord, Boskalis, DEME, Jan de Nul), figures from their annual reports were gathered to compare with the public expenses.

These two steps have resulted in the reported estimated size of 1.0 – 5.4 bn € GVA.

As an elaboration of this MEA, we have:

1. Explored the feasibility of allocation keys (see below)
2. Alternatively continued the bottom-up analysis by repeating the BG approach for recent years and at country level.
3. Derived an estimate from combining sources with data on environmental expenses, as explained below.

“The economics of climate change adaptation in EU coastal areas”, which was also used as a source for the BG study, contains data on the average annual expenditure in coastal protection over a certain time span, for a certain number of countries. In the case of Italy, for instance, one may take a time series of reference (2008, 2009, and 2010), and multiply the average annual expenditure (258.9 million) by three, so to have an estimated total expenditure of 776.7 million over the three years.

<sup>33</sup>European Commission (2009), The economics of climate change adaptation in EU coastal areas – Summary report.

Subsequently, we have taken data from EUROSTAT COFOG (COFOG gov\_a\_exp) on environment protection (GF05) for Italy. We found out that over the same three years Italy spent 41.030 million in environment protection (which of course include a broader range of activities).

The ratio (coastal protection/environment protection \* 100) between the two kinds of expenditure over our time series says that coastal protection amounts to 2% of the expenditure for total environment protection in Italy.

Therefore, we estimated that in 2008, 2009 and 2010 coastal expenditure was always 2% of environment protection.

A solution to estimate employment is yet to be found. However ballpark figures should not be difficult to find. The ballpark figure of EUR 100.000 of expenditure per employee, can be used if no other proxies are found

The GIS work has been carried out by COGEA for all countries, and the resulting percentages were applied for all sea basins/countries.

Employment needs to be estimated separately, or a ballpark figure of EUR 100.000 per employed person will be applied. Therefore, resulting GVA will be divided by 100.000 for achieving the number of persons employed.

#### **Allocation NACE data to maritime vs non-maritime**

Not applicable as Eurostat NACE will not be used.

#### **Allocation NACE data to MEAs**

Not applicable as Eurostat NACE will not be used.

#### **Allocation to sea basins**

For those countries bordering multiple sea basins (DE, FR, UK, ES), an allocation to sea basins is needed. Using available maps on coastline erosion (see sub-function report on coastal protection), this can be estimated. However it will remain an expert judgment as the available material is of qualitative nature.

### **MEAs 6.1+2 Security of goods and people and 6.3 environmental monitoring**

Under function 6, maritime monitoring & surveillance, in the Blue Growth study the following MEA were defined:

- 6.1 Traceability and security of goods supply chains
- 6.2 Prevent and protect against illegal movement of people and goods
- 6.3 Environmental monitoring

In the Blue growth study it was already concluded that 6.1 and 6.2 overlap and are difficult to separate. Hence in the Blue Growth study it was decided to combine these two and assess them jointly. This merger is also followed here.

Rather than being specific and well-defined economic activities, these three MEAs are “prerequisites” that can

facilitate the growth of the blue economy. For these reasons, GVA and employment data are generally not available.

No NACE codes can be directly attributed to these MEA.

The value chain approach cannot be of much help, as every attempt to build a value chain of the sector may be seen as “arbitrary”.

A possible solution to gather some data was to investigate at country level if any information exists via reports and data collection of Ministries (typically Environment and/or Defence), coastguards, police forces, environmental agencies, customs, etc.

An initial proposal was to assess whether national accounts have specific budget items dedicated to “Maritime monitoring and surveillance”. This worked for Italy, where a budget item attributable to the sector has been found. This provided however no useful or reliable data.

### **Allocation to sea basins**

Coastline length can be used to allocate this MEAs when a country borders on two different sea basins:

E.g. France<sup>34</sup>:

- North Sea: 60 km (1,44% of total expenditure and employment)
- English Channel: 1060 km (25,42% of total expenditure and employment)
- Atlantic Ocean: 615 km (14,75% of total expenditure and employment)
- Mediterranean Sea + Corsica: 2435 km (58,39% of total expenditure and employment)
- Total: 4170 km

This allocation has been validated by the Country experts and final allocation factors are introduced in the country reports.

### **Resulting figures**

These are included in part D (excel data file).

---

<sup>34</sup> [http://qcantal.free.fr/IMG/pdf/Les\\_cotes\\_francaises\\_-\\_correction.pdf](http://qcantal.free.fr/IMG/pdf/Les_cotes_francaises_-_correction.pdf)





## Part D Excel data file

A separate excel file is made in which all input data, calculations and resulting figures for all North Sea and Atlantic countries can be found. A comparison between data based on Eurostat, national statistics and other sources is included for those countries where multiple sources were found. A readme sheet gives further details on the structure of the file.



## Part E Estimating recent growth rates

In the previous parts of this annex, the methods for estimating the current size of maritime economic activities was described. Second to this, the recent growth should also be estimated, e.g. to assess the fastest growing marine economic activities.

To do so, time series data is needed on recent past years. The first approach taken for this is to gather Eurostat and national statistical data (NACE rev.2) for the latest available years, in most cases 2008-2010, and for national statistics sometimes also 2011. On this basis compound annual growth rates (CAGR) for these years can be calculated.

However:

- Eurostat and national statistical data sources only provide data for a limited set of maritime economic activities (some 10 of the 27, even less for some countries)
- Data gaps for specific countries and sectors have been addressed by estimating GVA and employment combining data from different years. As consequence, for these countries/sectors no time series is available from statistics.
- The time series based on NACE rev.2 is starting from 2008 only (the year the revision was introduced), causing the impact of the economic crisis may affect the growth rates calculated. However to make more long term time series a combination with NACE rev.1.1 (the previous statistical structure) would need to be made, which would only be possible for a handful of marine sectors and most likely show trend breaches.

For marine sectors estimated on the basis of alternative sources (if statistics don't provide data or if statistical data is considered unreliable), often no time series is available, at least in those cases where the source used is not repeated over time.

For these reasons, multiple approaches to estimating the recent growth are needed. These are:

1. If complete statistical data for 2008-2010 is available, the CAGR can be calculated from these, giving a 3-year based CAGR.
2. If statistical data is incomplete or unavailable, the first alternative approach is to use the alternative sources used for the size estimate and compare different years (example: the European Cruise Council reports on the size of the cruise sector annually in its annual report, and so does the EWEA for the (offshore) wind sector and the CESA (now Sea Europe) for the shipbuilding sector. If not available at European level, at national level also sometimes national sector reports are published annually (for instance in the Netherlands the maritime monitor has been made on behalf of the ministry of Infrastructure several years in a row).
3. If such alternative sources also don't give time series data for GVA and employment, we will need to take other indicators to estimate the development of the various MEA. The following are proposed (data for these indicators to be gathered for multiple years, not only including the last 3 years but preferably also presenting a longer time period of 10 years, so 2000-2010):

**Table 0.5 Alternative approaches to assess growth over time**

Function	Maritime economic activities	Possible indicator	Likely available multi-year source
0. Other sectors	0.1 shipbuilding and ship repair	Volume index of	Eurostat

Function	Maritime economic activities	Possible indicator	Likely available multi-year source
		production, Gross data	
	0.2 Construction of water projects	No alternative except identified for using NACE rev.1.1	Eurostat
1. Maritime transport	1.1 Deep sea shipping	Volume of deep sea cargo shipped, 1000 tons	Eurostat
	1.2 Short-sea shipping (incl. RoRo)	Volume of short sea cargo shipped, 1000 tons	Eurostat
	1.3 Passenger ferry services	Number of passengers served	Eurostat
	1.4 Inland waterway transport.	Volume of cargo shipped on inland waterways	Eurostat
2. Food, nutrition, health and eco-system services	2.1 Catching fish for human consumption	Volume index of production, Gross data	Tbd
	2.2 Catching fish for animal feeding	Volume index of production, Gross data	Tbd
	2.3 Marine aquatic products	No alternative except identified for using NACE rev.1.1	Eurostat
	2.4 Blue biotechnology	No data	
	2.5 Agriculture on saline soils	No data	
3. Energy and raw materials	3.1 Oil and gas	Annual production volumes (toe) + assume constant share offshore	Eurostat (volumes), JRC (offshore shares). To ask OGP in interview 23 July
	3.2 Offshore wind	Capacity installed measured in MW	Tbd
	3.3 Ocean renewable energy	Capacity installed measured in MW	Tbd
	3.4 Carbon capture and storage	No data	
	3.5 Aggregates mining (sand, gravel, etc.)	Volume of marine aggregates	UEPG only provides time series as of 2008
	3.6 Marine minerals mining	No data	
	3.7 Securing fresh water supply (desalination)	sea water and brackish water desalination production value	Global Water market (2011) only publishes data as of 2008.

Function	Maritime economic activities	Possible indicator	Likely available multi-year source
4. Leisure, working and living	4.1 Coastal tourism	Volume index of production accommodation (NACE 55)	Eurostat (includes both coastal and non-coastal)
	4.2 Yachting and marinas	No data	
	4.3 Cruise tourism	1000PASC - 1000 cruise passengers starting and ending a cruise	Eurostat
5. Coastal protection		No data	
6. Maritime monitoring and surveillance	6.1 Traceability and security of goods supply chains	No data	
	6.2 Prevent and protect against illegal movement of people and goods	No data	
	6.3 Environmental monitoring	No data	

It is noted that for several indicators proposed above, data is available at a higher aggregation level, often including both onshore and offshore activities (e.g. oil & gas, aggregates mining).

For the MEA that are based on Eurostat data (see part A of this annex), alternative data was gathered over longer time series (back to 2000 if available), and CAGR were calculated per country and MEA. The input data, calculations and results are included in part D (excel data file). It is noted that for a number of Eurostat-based indicators, Eurostat tables appeared empty or data for particular countries was not presented.

### Work in progress

For other (non-Eurostat) indicators, data is being gathered and will be added to part D. Also for countries/sectors where the Eurostat indicators did not provide data, alternatives will be identified, and added to the calculation sheets of part D.

## Part F methodology for future potential

**A number of (qualitative) indicators** are used to assess the future potential of economic activities. These are combined with a number of key external drivers which will determine their importance in a long term period:

- **Innovativeness**, (relevance of R&D and innovations) – see also chapter 3 of the country fiches;
- 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.

For each maritime economic activity, scores are given based on expert views derived from the function and economic activity analyses conducted within this study. For the ranking order (see also the country fiches), the following elements need to be taken into account:

**INNOVATIVENESS:** in general, traditional maritime economic activities are expected to have low(er) activities of innovation since they focus more on improving existing technologies (incremental innovation). On the contrary, economic activities in the pre-development and growth stage are expected to have more significant investments in R&D. However, these general assumptions need to be contextualised to specific country environment, where new economic activities could have only marginal investments in innovation.

**COMPETITIVENESS:** this indicator should assess the expected future position of a given economic activity of a country in the EU/international market. Furthermore, competitiveness should be assessed also comparing the economic activity of a given country to the same economic activities of other countries in the same area/sea-basin.

**EMPLOYMENT:** in general, traditional maritime activities are expected to have less impacts on future job creation (as compared to the ones in the pre-development stage, for instance), because of their consolidated economic activities which tend to expand only marginally. On the other hand, traditional economic activities are strongly linked to the overall employment of a given country. As a general rule, growing economies with expanding employment should spill their positive trends also over maritime activities. As regards new activities, these are not strictly linked to the creation of new jobs, especially because they could be based more on technology than on job creation.

**POLICY RELEVANCE:** this indicator should assess the regulatory activity underlying each specific maritime economic activity in a given MS, especially taking into account ambitions of the EU2020 strategy. It has to be considered that legislative activities concern more often traditional economic activities (mature) than maritime economic activities in the pre-development and growth stage, because of their socio-economic role and the EU's contribution to global policies for these (e.g. catching fish for human consumption).

**SPILL-OVER EFFECTS:** occur, when

one activity is transferred or conveyed to other economic subjects by unintended means. This effect may be generated through technology transfer or the re-use of facilities in certain industries and it penetrates into the activity.

**SUSTAINABILITY:** strongly linked to policies, the sustainability indicator looks to environmental aspect of each economic activity. This should not be assessed only taking into account the related impact, but it should also take into consideration legislative efforts undertaken and/or efforts by the sector itself towards a more sustainable economic activity.



P.O. Box 4175  
3006 AD Rotterdam  
The Netherlands

Watermanweg 44  
3067 GG Rotterdam  
The Netherlands

T +31 (0)10 453 88 00  
F +31 (0)10 453 07 68  
E [netherlands@ecorys.com](mailto:netherlands@ecorys.com)

**W** [www.ecorys.com](http://www.ecorys.com)

***Sound analysis, inspiring ideas***