

**Workshop on strategic  
cooperation on Blue Growth  
in the North Sea**



**The Hague 20-21 June**



**EU  
2016**



European  
Commission

# **Strategic Co-operation on Blue Growth in the North Sea**

**WORKSHOP BACKGROUND PAPER (12 MAY 2016 - PRELIMINARY VERSION)**

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## Blue Growth challenge & opportunities in the North Sea

The blue economy spans multiple industries related to the oceans, seas and coasts and is, by definition, cross-cutting and interdependent. Blue Growth is the EU strategy to support economic change and competitiveness through innovation in the marine and maritime sectors as a whole. It is part of the transition to a more competitive and knowledge-based EU economy.

This paper supports and informs discussion at a workshop organised by the European Commission (Directorate-General Maritime Affairs and Fisheries) and hosted by the Province of Zuid-Holland in The Hague on 20-21 June 2016.

The aim of the workshop is to explore the state of play with regards to strategic transnational cooperation on blue growth in the North Sea area. and to discuss with stakeholders on a number of challenges to effective co-operation in a participative and inclusive way. The workshop will examine what can be done to accelerate strategic public-private partnerships to maximise joint business opportunities in blue growth value chains in the North Sea region.

This is an excellent opportunity for relevant North Sea stakeholders to shape possible European thematic support actions, such as for example specific blue growth cooperation platforms.

A key outcome will be recommendations on how strategic public-private partnerships could be facilitated and how projects could be coordinated to maximise joint business opportunities in blue growth value chains.

This paper provides a summary of evidence on the broad set of economic drivers related to the blue economy in the North Sea area. It is focused, in particular, on challenges and opportunities for strategic transnational co-operation to accelerate strategic public-private partnerships and projects to maximising joint business opportunities in the North Sea region. For the purposes of this workshop, the North Sea area is defined as incorporating the coastal regions (appendix A) of Belgium, Denmark, Germany, France, the Netherlands, Norway, Sweden and the UK.

The paper also incorporates the findings from a [survey](#) (conducted during March-April 2016) to collect views and experience from stakeholders and potential workshop participants (see appendix C) so as to foster a focused and result-oriented discussion. The background paper is structured as follows:

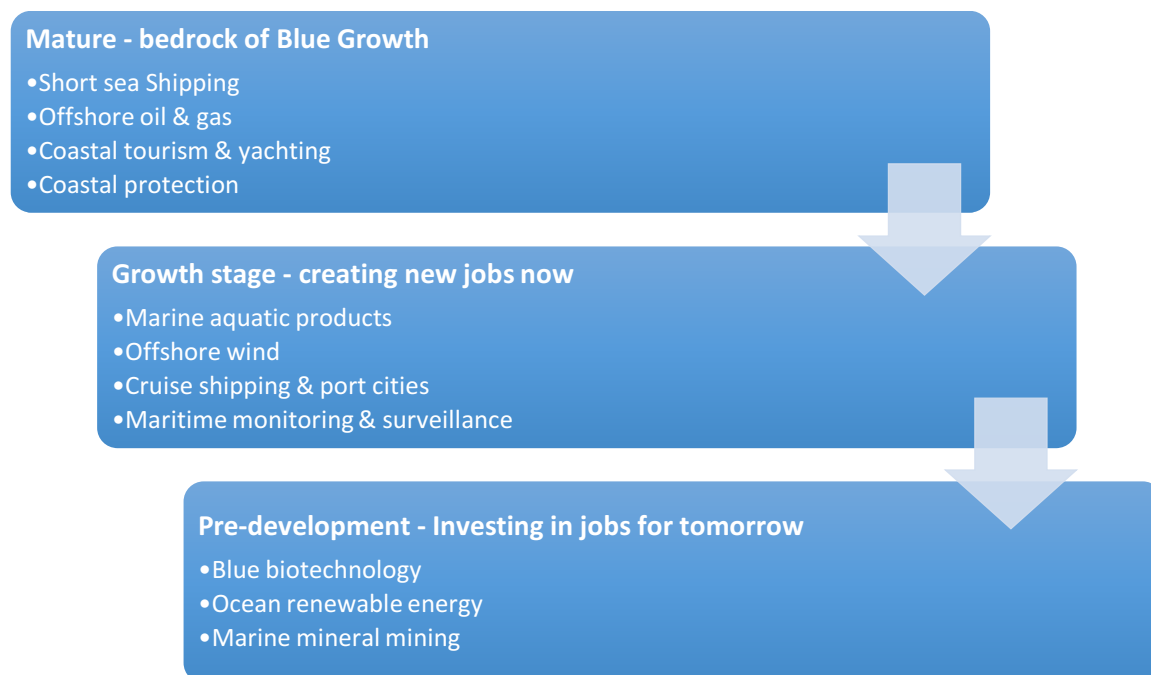
- A first section provides a short summary of available data on the blue economy and blue growth potential in the North Sea area
- The second section summarises current co-operation structures and patterns and draws lessons on barriers and drivers using available literature and the survey results
- The final section sets out a number of issues for discussion at the workshop and summarises the survey findings on priorities for co-operation.

### 1. *Blue growth potential in the North Sea area*

Europe's maritime and coastal (or blue) economy has a significant potential to contribute to long-run sustainable job creation and economic development. The potential for 'blue growth' was recognised in the 2012 European Commission Communication on opportunities for main and maritime sustainable growth. In short, Blue Growth is the maritime dimension of the Europe 2020 strategy.

Blue Growth scenarios and maritime policies were examined by a series of in-depth reports for each European sea basin area during 2012-14. The 2012 scenarios and drivers report on Blue Growth (Ecorys et al) estimated that the Blue economy in Europe was equivalent to the scale of the Belgian economy (a gross value added of €485 billion, a total of 5.4 million people employed, including maritime economic activities in landlocked countries). The study noted that over the previous decade growth rates had been impressive and estimated that by 2020, maritime economic activities would grow to an estimated €590 billion and employ 7 million people. The study identified 11 core blue economy activities grouped in three stages in terms of their 'lifecycle' development phase.

*Figure 1: Blue growth economic activities by lifecycle stage*



Source: Ecorys et al (2012): *Blue Growth Scenarios and Drivers for Sustainable Growth*.

The Blue Growth potential of the North Sea area was analysed in a 2014 report (Ecorys et al) covering Belgium, the Netherlands, Germany and Norway. Complementary information on other North Sea basin countries (Denmark, Sweden, France and the UK) was collected in reports on other sea-basins. The report estimated that the North Sea's maritime (blue) economy represented at least €150 billion (or approximately 30% of the EU total) and employed at least 850,000

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people. Specific estimates of the scale of the blue economy in each country (or North Sea coastal regions) were made as summarised in the table below.

Figure 2: Estimated scale of Blue Growth economy in North Sea (Ecorys et al, 2014)

North Sea coast areas of:	Maritime jobs	Enterprises	GVA	Main Blue Growth activities
Belgium	37000		€4bn	Deep and short-sea shipping coastal tourism and protection, offshore wind.
Denmark (part)	12,000			Offshore oil & gas, wind, short-sea shipping and coastal tourism
Germany (part)	170,000	4000	€14bn	Shipping (including shipbuilding), fishing, offshore wind,
Netherlands	140,000	9000	€13bn	Deep and short-sea shipping, offshore oil & gas, water projects, shipbuilding (incl. small craft) and inland waterways (yachting)
France (Nord-Pas de Calais only)			€2bn	Inland waterways, passenger transport.
Norway	150,000	14,000	€80bn	Offshore oil & gas, fishing, shipbuilding, aquaculture
Sweden (Västsverige)	12,000		€2.2bn	Shipbuilding and repairs, inland waterway
UK	330,000		€43bn	Offshore oil & gas, coastal tourism

Source: Ecorys et al (2014)

The 2014 North-Sea Blue Growth report suggested that the following key sectors were the most relevant and had the highest future development potential in the North Sea: offshore wind, offshore oil & gas, aquaculture, deep-sea shipping, shipbuilding, cruise tourism and coastal protection. The conclusions was that “development and adaptation of innovative, sustainable cross-sectoral approaches, procedures and infrastructures will be one of the main drivers in the region”.

In a 2015 report, the European Cluster Observatory classified Blue Growth as one of Europe’s key ‘emerging industries’. Blue Growth industries were defined to include water transportation (sea, coastal and inland) together with related activities in logistics, production technology and engineering. Hence, these industries cover the development and use of the potential of oceans, seas, and related infrastructures as well as any inland fresh-water sources.

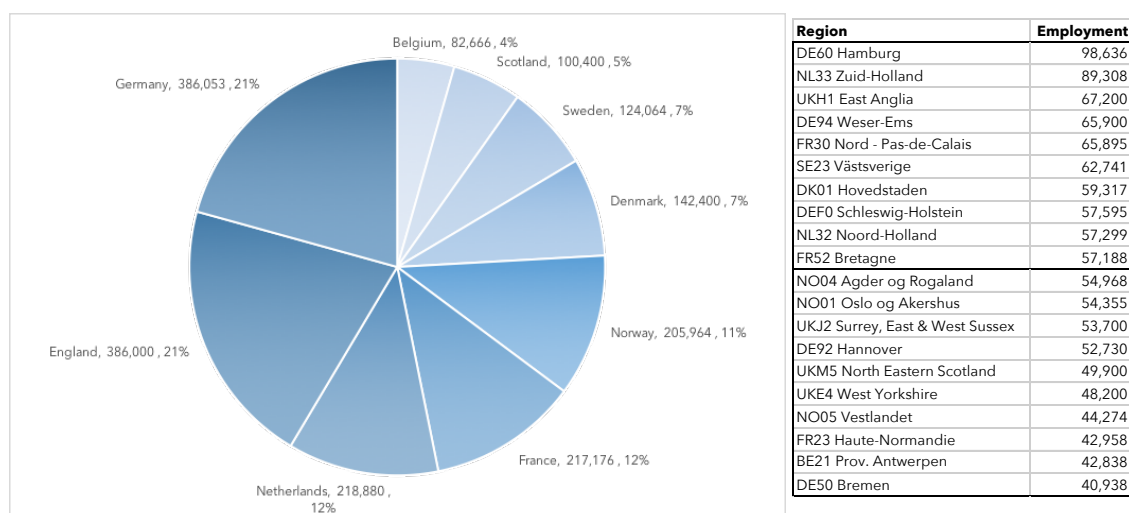
Using this definition, the Observatory estimated that Blue Growth industries represent 11.8m employees and more than €2 trillion in turnover in the EU28. Blue Growth is one of the largest emerging industries and corresponds to between 6-7% of the European economy. The report also not that the Blue Growth industries had grown consistently faster than the overall economy, though they were hit rather

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strongly by the recession and employment declined from 2008-13. While the wage levels are exactly the same as in traded industries as a whole, value added is substantially higher suggesting a productivity advantage of this industry.

The figure below summarises 2013 employment data from the European Cluster Observatory for the selected North-Sea regions (see Appendix A). Based on the selected regions, Germany and England account for 21% each of North Sea blue economy employment (full time equivalents), followed by the Netherlands, France and Denmark. Ranking the regions by employment, the top 10 account for 36.5% of total Blue Growth employment in the North Sea, led by Hamburg and Zuid-Holland. Each of the North Sea countries is represented by at least one top 20 region in terms of employment.

Figure 3: Blue Growth employment (FTE) 2013 per North Sea country and top 20 regions



Source: European Cluster Observatory, calculations author

The data underlines the diversity of Blue Growth employment 'hot-spots' round the North Sea with various 'clusters' driving employment growth from shipping through oil & gas, offshore renewable energy to marine food products and fishing.

According to the European Cluster Observatory, the North Sea regions are relatively highly specialised (see Figure 4) in the Blue Growth field. Indeed, eight out of the 10 top European Blue Growth 'clusters' are in the North Sea coastal area.

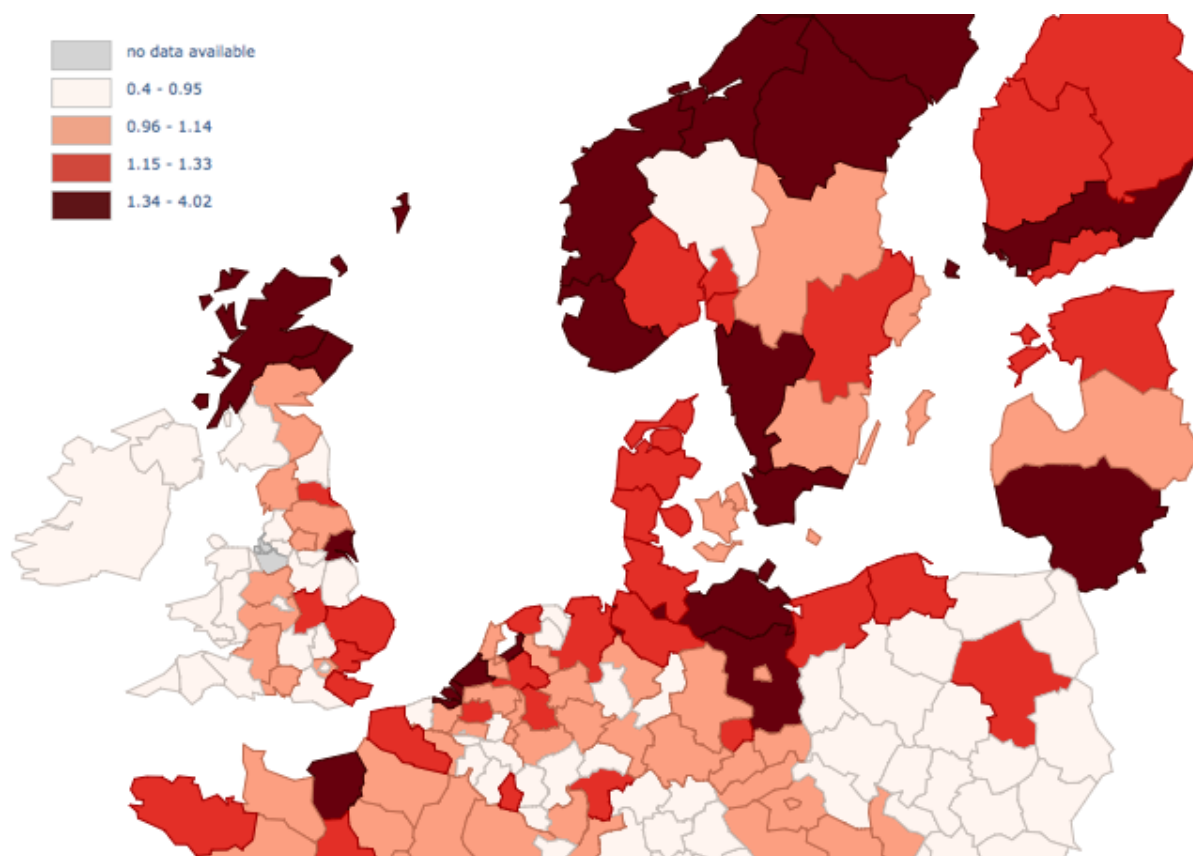
The strongest Blue Growth clusters all have water transportation at their core: Rotterdam and Hamburg are Europe's two busiest ports and predictably occupy top positions. On the other hand, two Norwegian regions, Oslo and Kristiansand, have generally better productivity and dynamism scores and have a substantial share of shipbuilding in addition to logistics-related industries.

The regions with strong Blue Growth clusters have very high labour productivity (€75 000 vs €55 000 overall), partially due to the presence of rich Norwegian and Dutch regions. On the other hand, according to the report, the focus of some

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regions, particularly in the Netherlands, on large port- and logistics-related infrastructure creates a risk of poor environmental sustainability.

Figure 4: Blue Growth - regional specialisation 2013



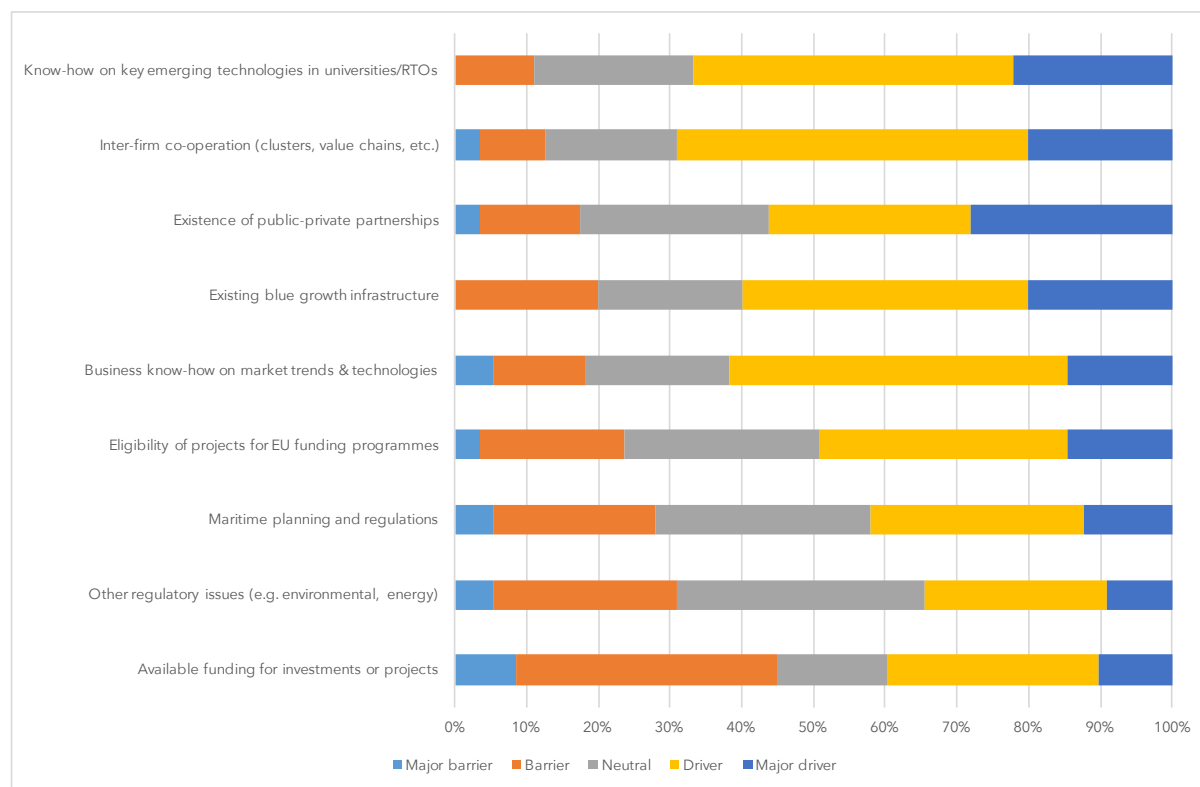
Source: European Cluster Observatory, extracted April 2016, specialisation over 1 indicates a relative specialisation compared to EU average.

Building on such evidence could be a first step in developing more structured co-operation between clusters and/or regions. For instance, a detailed analysis of specialisation by sub-industries/clusters would help identify potential synergies, value chain linkages, complementary know-how, etc. and clarify which regions are specialised in specific mature, growth or pre-development activities.

The survey respondents were asked to rank the main drivers and barriers for blue growth development in their country or region. Most factors proposed were considered to be drivers rather than barriers with only available funding for investments scoring considered to have a negative effect (36% of respondents considering it to be a barrier), regulatory issues including maritime planning were the second most important type of barriers (between a fifth and a quarter of respondents indicating maritime planning, environmental, energy, etc. regulations created a barrier to blue growth. On the other hand, know how on key emerging technologies in universities, business know-how on market trends and technologies and inter-firm co-operation on blue growth were considered as drivers. A fifth of respondents pointed to blue growth relevant infrastructure as a barrier.



Figure 5: Drivers and barriers for the blue economy



Source: Survey of North Sea region stakeholders - March-May 2016

## 2. Blue growth clusters and value chains in the North Sea

According to the European Cluster Observatory, there are 79 European cluster organisations in the Blue Growth field, many of which are located in the regions with strong Blue Growth specialisation (Appendix C : Clusters in the North Sea regions

Figure 19 provides a provisional listing of cluster organisations in the North Sea area in fields relevant to the Blue Growth area. This list was compiled based on the ESCA<sup>1</sup> accredited clusters (bronze, silver or gold) plus a literature review and internet search. A number of clusters were included that do not necessarily have 'blue growth' as a primary focus but that may include some activities relevant to the overall blue growth theme (e.g. clusters in engineering, life sciences and broader food technologies).

Based on this preliminary 'cluster mapping' there are strong concentrations of expertise in specific blue growth topics, notably:

- Oil & Gas & sub-sea systems: Norway, Scotland,
- Offshore wind: Denmark and Germany
- Maritime transport: Netherlands, Germany, Denmark, Sweden and Norway

<sup>1</sup> <http://www.cluster-analysis.org/>

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Other areas such as aquaculture / blue biotech are less obviously present in the cluster mapping with the main expertise, at first sight, located in Norway and Scotland. Clusters in service sectors such as coastal tourism are absent, with the exception of initiatives in Germany, the Netherlands and Norway.

The cluster mapping adopts a broad definition of a cluster as any form of business-academic-public sector co-operation to support the development of blue growth activities. In certain 'pre-development' blue growth areas, expertise in key technologies or skills may not yet translate into business activities; while in mature or growing blue economy fields, cross-cutting technologies (e.g. chemical processes, engineering or digital technologies) may be critical to enable a renewal of business models or new product-process innovations. Hence, while focusing on the 'blue growth' potential, identifying 'related variety' or cross-cutting technologies in regional economies may provide a basis for new specialisations to emerge.

### **3. Blue Growth strategies and policies in the North Sea area**

The European Commission's Smart Specialisation (S3) platform's Eye@S3 database tracks the smart specialisation priorities of member states and regions. The table below summarises (data from April 2016) the blue growth relevant priorities of RIS3 strategies in North Sea regions. Not all North Sea regions declared a priority to blue growth, however, the listing should not be considered as exhaustive or comprehensive and the level of detail of the priorities declared varies markedly.

*Figure 6: North Sea Regions - Blue Growth Smart Specialisation priorities*

<b>NUTS</b>	<b>Region name</b>	<b>Description</b>
BE2	Flemish Region	Sustainable energy technologies with focus on hydrogen, wind energy and electrical vehicles. Part of 'Sustainable living' Specialised industrial value chains and logistical services for food, pharma, recycling, off shore maintenance, etc. 'Value-added logistics'
DE5	Bremen	Wind energy Maritime economy & logistics
DE6	Hamburg	Energy, climate, environmental protection & marine technology
DE9	Niedersachsen	Maritime economy
DE94	Weser-Ems	Maritime sector - shipbuilding, seafaring, Port industry / logistics, Ocean technology, Maritime service
DEF	Schleswig-Holstein	Renewable energies (services/logistics, biomass, energy efficient technologies, expansion of offshore wind energy, software for renewable energies, energy and drive technology, nano-particles, materials, coatings) Maritime economy (maritime technologies, specialised ship construction, offshore energy (wind, oil, gas), maritime biotechnology, production facilities, wind parks, facilities to refuel ships with LNG or other alternative fuels, innovative harbour infrastructures for the cruise economy)
DK	Denmark	The maritime sector - the blue Denmark

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NUTS	Region name	Description
DK05	Nordjylland	Maritime sector
FR23	Haute-Normandie	Wind turbine systems, sustainable energy
FR25	Basse-Normandie	Oyster mortality, sustainable methods of aquaculture, re-use of waste such as empty shells and their transformation in building material, culture of Algae, preservation of marine ecosystems, Renewable marine energy generation
FR30	Nord - Pas-de-Calais	Health and Nutrition - Specialisation 3 : Sustainable water resources development and promotion
FR52	Bretagne	Sustainable food supply chain (a) Food quality & safety, b) new agricultural production models, c) Food Factory of the Future) Maritime activities for blue growth ( a) Marine renewable energy, b) Sustainable use of biomass and biotechnology (for all applications), c) Recovery and use of marine mineral resources, d) New models for exploiting living resources (fishing and aquaculture), e) Boats of the future, f) Maritime security and safety)
NL12	Friesland (NL)	Dairy production
NO033	Vestfold	Maritime industries, oil and gas
NO053	Møre og Romsdal	Maritime technology - services, industry and production; Marine added value - food, biotechnologies and marine
NO071	Nordland	Suppliers to seafood industry
NO072	Troms	Supplier industry - welfare technology, marine, maritime, oil and gas.
NO073	Finnmark	Food - bio-, marine and food
SE232	Västra Götalands län	Maritime industries, support to maritime industries and sustainable transportation by sea.
UKJ4	Kent	Renewables and Low Carbon
UKM	Scotland	Food & beverages, Energy, Marine Energy
UKZ	England	Offshore wind, Oil & gas

Source: eye@RIS3, data extracted April 2016.

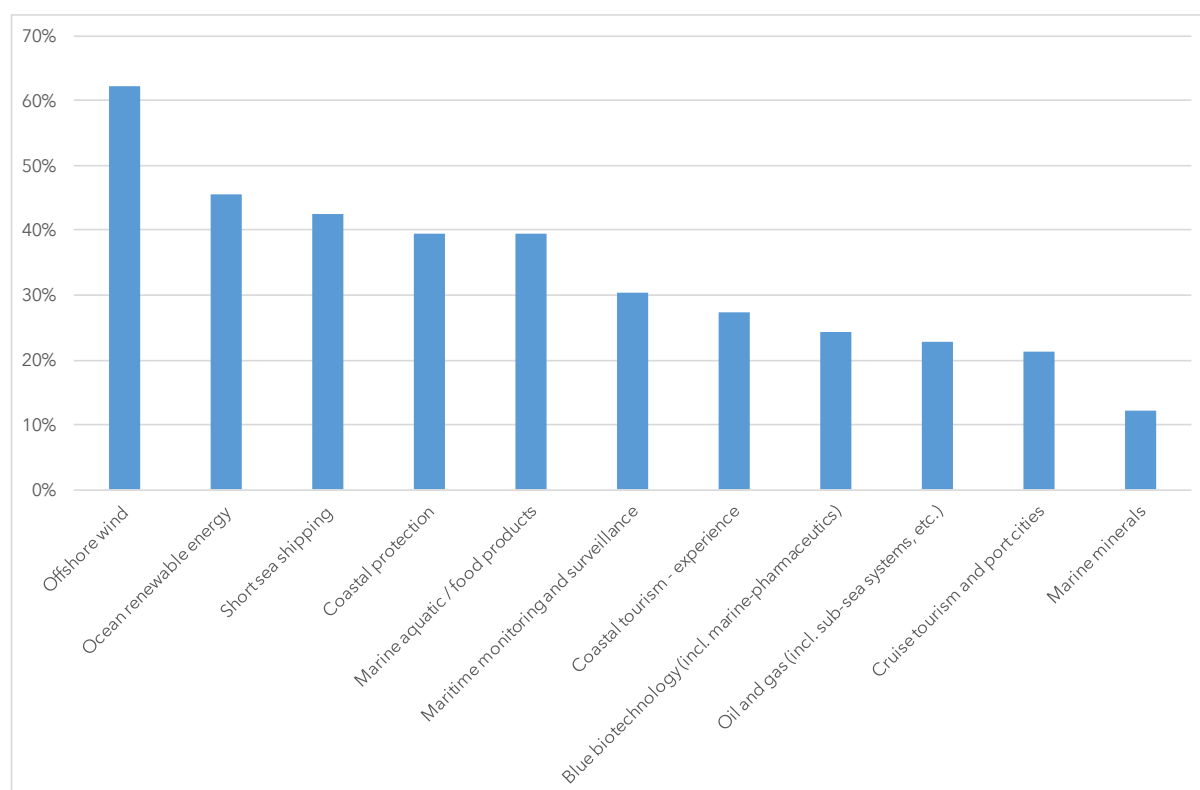
In order to help complete the picture, the survey asked correspondents to identify which blue growth priorities their region or country had addressed in strategies.

According to survey responses, the offshore wind topic has been the most frequently addressed followed by offshore renewable energy, short-sea shipping, coastal protection and marine food/aquaculture. Other fields such as marine mineral (blue mining) or blue biotechnology are less high on the policy agenda. Oil & gas is surprisingly low but this may reflect the mature nature of the sector and the intense competition between major multinational firms in the sector.

In terms of aquaculture, the EU Member States have developed [Multiannual National Strategic Plans](#) for the promotion of sustainable aquaculture. The plans address the barriers identified in the 2013 Strategic Guidelines and propose actions to enhance the sustainable development of aquaculture.

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Figure 7 : Frequency of strategies addressing specific blue growth priorities in the North Sea region



Source: Survey of North Sea region stakeholders - March-May 2016

Based on survey responses and a literature review, the following paragraphs summarise for each country and/or major region, the main blue growth relevant strategies and highlight relevant funding programmes, initiatives and key maritime research and innovation organisations, etc.

**Flanders (Belgium)** The Flemish Smart Specialisation strategy<sup>2</sup> is structured around seven strategic cluster under two of which technologies or market opportunities of relevance to blue growth are covered. Sustainable energy technologies and value added logistics both include focus on areas of relevance for blue growth. At a sub-regional level, the Province of Western Flanders<sup>3</sup> aims to support the development of a number of clusters including around the theme of 'Blue Energy': Ahead of the Wave. A [roadmap for Blue Energy](#) was prepared in 2014. The development of blue energy activities builds on a 'knowledge pool' including the Flemish Marine Institute ([VLIZ](#)), Flanders Maritime Cluster ([FMC](#)) and the Offshore Wind Infrastructure Application Lab ([OWI-lab](#)). According to survey respondents, the FMC is currently working on the development of a blue growth strategy.

<sup>2</sup> See: [www.vlaio.be/download/file/fid/33427](http://www.vlaio.be/download/file/fid/33427)

<sup>3</sup> See: <http://www.tuawest.be/tua-in-english/economic-clusters/>

### **Denmark**

The blue economy is a major priority both nationally and at regional level in Denmark. Ecorys (2013) identified six most promising maritime economic activities for Denmark as short-sea shipping, passenger ferry services, fish for human consumption, marine aquaculture, offshore wind and coastal tourism. Denmark has an internationally recognised leading place in the field of [offshore wind](#) and this is reflected in the strategic efforts made to maintain this lead.

The Maritime industry is one of eight “growth teams” promoted by the Danish Government and the national innovation strategy includes a commitment to developing the ‘Green Ship of the Future’.

According to survey respondents, the Danish government is preparing a new Blue Growth plan during 2016 to update the 2012 [Denmark at Work - Plan for Growth in the new Denmark](#). This strategy is essentially related to shipping, marine equipment, shipbuilding and auxiliary activities.

A strong emphasis was placed on green shipping and green solutions; in addition, the services provided by maritime industries to offshore oil & gas and wind are critical for the development of these sectors. [Offshore Centre Denmark](#) is the national knowledge and innovation network for the offshore sector, which is a member based organisation that coordinates joint project development.

### **France**

In France, a [national strategy for the sea and coast](#) has been under preparation for several years involving a wide consultation. Although not yet adopted, the Secretary of State for the Sea announced in autumn 2015 that it would focus on support for the development of major ports; green shipping (e.g. call for proposal for ‘clean ferries’), [future ships roadmap](#) (CORICAN) and a partnership based approach to the development of aquaculture.

In terms of North Sea interests, following the restructuring of regional governments in France, the Nord-Pas de Calais and Picardy regions merged to form the new Hauts-de-France region. The economy of the region is varied but a significant coastline and major freight and ferry ports mean that the maritime dimension remains important. In preparation of the merger, work was done to combine and [align priorities](#) including for the two regional smart specialisation strategies. Aquaculture products in future foods is one of the sub-themes of the Nord-Pas de Calais RIS3 under the strategic activity priority ‘healthy food’.

One of the eight ‘competence clusters’ in the region is the [Pole Aquimer](#) based in Boulogne, focused on seafood and aquaculture innovation, with research and technology development supported by research facilities such as IFREMER. In terms of related education and training, the [Campus de la Mer](#) initiative aims to

coordinate universities and related institutes on maritime and coastal topics. In the energy field, a new initiative is being launched in Dunkirk, Euraénergie.

### **Germany**

According to Ecorys (2013) the seven maritime activities with the most future potential in Germany's north sea region are offshore wind, coastal tourism, deep-sea shipping, short-sea shipping (incl. Ro-Ro), cruise tourism, shipbuilding and ship repair and marine aquatic products. Four important 'clusters' of activity exist in the German north-sea regions Ems-river axis (ship-building, offshore wind), Bremen-Oldenburg, Hamburg, Schleswig-Holstein and in 2011 the states concerned launched an initiative to federate their efforts in support of the maritime economy. The [Maritime Cluster Northern Germany \(MCN\)](#) promotes networking among the various players in the maritime industry and seeks to 'transcend sectorial and state boundaries'. This model could potentially be used for the broader North Sea area.

A [national masterplan for maritime technologies](#) (NMMT) has been developed at Federal level since 2010 (updated continuously) is designed as a dynamic, modular and open concept. The NMMT includes an action plan and individual measures divided in areas of application (main markets and technology), enabling to identify key strategic areas of action in a series of fields: offshore engineering oil and gas; offshore wind energy subsea engineering / submarine cable, coastal engineering / hydraulic, maritime metrology and environmental technology, hydrography, maritime traffic control and safety technology, mariculture, ice and polar engineering, ocean energy and deep sea mining.

The four German North Sea states have strong maritime economies and traditions that are reflected in their current strategies with all giving the maritime economy a core place in their RIS3. The two 'port states' of Bremen and Hamburg are facing long-term challenges related to global competition in short and deep sea shipping. They have diversified economies (e.g. aeronautics and life sciences are important in both) but maintain a strong focus on maritime economy related opportunities,

The framework of Bremen's [innovation policy](#) is set out in the "Innovation Programme 2020" adopted in 2015. The Bremen Smart specialisation strategy includes eight priority sectors split into three groups, maritime industries/logistics and wind energy are two out of three priority [innovation clusters](#). The strategy sets out a number of objectives and measures ranging to be undertaken in order to strengthen the two blue economy fields. Moreover, Bremen hosts a number of maritime research or technology centres such as [MARUM](#) and the maritime safety and security cluster ([MARISSA](#)) was established in 2010. The cluster is coordinated by Bremeninvest and forms part of the Federal Government's NMMT since 2011.

The [Hamburg RIS3](#) is structured around a series of existing [cluster initiatives](#) including [logistics](#), [renewable energy](#) and maritime industries. In the maritime field Hamburg hosts the [Fraunhofer Centre for Maritime Logistics and Services \(CML\)](#)

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which develops and optimises processes and systems along the maritime supply chain, as well as the Centre for Marine and Atmospheric Sciences (ZMAW) and the German Centre for Marine Biodiversity Research (DZMB) and many more making Hamburg a hub of maritime science.

Schleswig-Holstein has a well-developed maritime economy policy including the [Zukunft Meer](#) 'sea our future' initiative and a related [Maritime Action Plan](#) adopted in 2013, which adopts a cross-departmental and multi-sector approach to the blue economy. In terms of the [regional innovation strategy](#) adopted in 2014, the maritime economy and renewable energies (including offshore wind) are two out of five priorities. In addition, Schleswig-Holstein adopted in 2012 a [Marine Biotechnology plan](#). The region hosts the national competence centre in research on marine aquaculture with a strong scientific basis with the Kiel Centre for Marine Natural Projects (KiWiZ) at the GEOMAR | Helmholtz Centre for Ocean Research, the Fraunhofer Research Institute for Marine Biotechnology, 26 (in 2012) marine biotechnology companies, etc.

In Niedersachsen, the blue growth theme is present in two out of seven competence areas prioritised by the RIS3: energy technologies with the sub-theme of off-shore wind and maritime technologies with sub-themes of Ocean Engineering and Green Shipping. The coastal sub-region of Weser-Ems concentrates expertise in [maritime technologies](#) (the northern sub-region of Weser Ems) given a long tradition in shipbuilding and seafaring. As part of the RIS3 process, a [MasterPlan Maritime Economy](#) was drafted in 2015 with four priority fields of activity: green shipping; sustainable port industry; maritime offshore development; maritime cross-cutting tasks. Under the first priority, the [Mariko Maritime Competence Centre](#) in Leer supports the shipping sector. It is coordinating an Interreg V project [MARIGREEN](#) on green shipping with a consortium of 59 German and Dutch maritime companies and research institutions, a total of 12 innovation projects will be supported.

## **Netherlands**

At national level, the Dutch Maritime Strategy 2015-25 provides a "comprehensive framework for the Dutch maritime cluster" and was drawn up in close consultation with business and other stakeholders. The maritime cluster consists of 12,000 companies, provides employment to approximately 224,000 people and achieved a total added value of €21bn (3.3% of Dutch GNP). The strategy underlines the strong interlinkages between the various activities within the cluster and the 'knowledge spillovers' that occur as well as the important spatial relations and logistic roles played by the Dutch ports. The strategy places an emphasis on six cluster wide policy areas including human capital, innovation, trade, accessibility, safety and the environment and security and stability. A North Sea co-operation dimension is not specifically mentioned in the strategy and the trade priority vision

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is more global (working with [maritime hotspots](#) or 'partners for water'). The North Sea dimension is mainly considered in terms of improving accessibility and logistics (e.g. European Blue Belt Project), safety and the environment (shipping traffic, clean seas, etc.), in line with the Dutch Government's [North Sea 2050 spatial agenda](#).

The maritime strategy aims to develop appropriate linkages with the Dutch '[top sectors](#)' of water (maritime, delta and water) and logistics (the port of Rotterdam, etc.), which are the two of nine priority sectors at national level. The government, private sector, universities and research centres work together in the Top Sector Alliance for Knowledge and Innovation (TKI). The Innovation Contracts of the two top sectors are expected to support the maritime cluster in addressing a number of identified challenges in order to remain competitive. Important innovation areas for the coming years are the environmental performances of the fleet (environmental friendly vessels), support for the offshore extraction of raw materials and energy generation, smart and safe maritime navigation, focus on social innovations (organisational innovation) and an improvement of the integration of the maritime cluster in the logistics chain. To further stimulate innovation in the sea ports, knowledge will be exchanged where possible and innovation projects of port authorities will be linked to the port industry (Knowledge Institute Smart Ports).

The Top Sector priorities (which focus national funding) tend to influence the regional (provincial) level strategies. The [South Netherlands](#) RIS3 places a strong emphasis on cross-border and inter-regional co-operation and identifies a number of opportunities for co-operation with neighbouring regions (notably Flanders). Blue Growth elements of the strategy include food, potentially elements of green chemistry and logistics (given the predominant role of the Port of Rotterdam linked to neighbouring Antwerp in Flanders).

[Northern Netherlands](#) RIS3 targets five priority clusters including water technology and energy (natural gas). The RIS3 does not prioritise the blue growth field explicitly although tourism and recreation (including water sports) and the maritime sector are mentioned as secondary priorities. In the energy priority cluster, the RIS3 mentions explicitly existing collaboration with Lower Saxony, Scotland and Norway. INTERREG is mentioned as an additional instrument supporting the strategy, notably co-operation with Northern Germany

Maritime and water activities are a priority in the [Western Netherlands](#) RIS3 which aligns the RIS3 topics with the national 'Top sectors' and seeks to explore 'cross-overs' between different sectors and technologies so as to tackle societal challenges. Specifically, under the water theme, the RIS3 mentions a focus on Smart and clean ships, winning on the waves (offshore industry), Sustainable Delta Cities, water technology and dike monitoring. The Dutch expertise in water technologies and coastal protection are likely to be relevant other North Sea regions in anticipating the future effects of climate change on coasts.



### **Norway**

In 2015, the Norwegian Government published [Maritime options - blue growth for a green future - Maritime Strategy](#). The strategy underlines that Norway's maritime industry is an important driving force in terms of value creation and spill-overs to other industries. In terms of blue growth, the strategy states that Norway has strong competence and a highly professional environment in the ocean industries. However, the maritime, seafood, oil and gas industries can grow more by learning from each other. The Government aims to stimulate increased cooperation between the offshore industries. Untapped potential is seen in making shipping greener and by developing and employing known technology across the marine environment.

In addition, there are strategies for offshore oil and gas (2011) and for, seafood and aquaculture (2012) and marine biotechnology is included under the [national strategy for biotechnology](#). Norway has a built up [broad network](#) of National and Global Centres of Expertise including in offshore and subsea fields and seafood, aquaculture and maritime cleantech.

As can be seen from the table above, most of the Norwegian regions have specific priorities related to blue growth in their economic development strategies. As Ecorys (2013) point out the western and southern regions (Ager and Rogaland and Vestlandet) have a dominant position in the maritime economy, notably in offshore oil and gas, deep-sea shipping, shipbuilding and aquaculture.

### **United Kingdom**

At UK wide level, a UK [Oil and Gas strategy](#) was adopted in 2013 and a UK [Marine Industries Roadmap](#) was developed in 2015 (following up a [2011 strategy](#)). The focus of UK policy is thus more on marine industries ([maritime transport](#), [sub-sea](#) and other related maritime engineering expertise) and offshore energy (notably wind but also wave and tidal). Other blue growth/economy fields are not subject to the same level of attention and the term blue growth is rarely used in UK policy documents. Major policy initiatives relevant to the blue economy include the [Offshore Renewable Energy Catapult](#), to which Innovate UK's delivery plan for 2016-17 awards a further £12m. The ORE Catapult will bring on stream its newly acquired 7MW turbine at Levenmouth as a dedicated open access research facility.

In **England**, economic development planning and strategy is developed via '[local enterprise partnerships](#)' (LEPs). The LEPs bordering the North Sea are South East, New Anglia, Greater Cambridge & Peterborough, Greater Lincolnshire, Humber, York, North Yorkshire and East Riding, Tees Valley and North East. London LEP area could also be considered as a fluvial port and important headquarters of maritime

organisation. Each of the LEPs has a strategic economic plan which provides the framework for prioritising available public(-private) funding (including ESIF).

The English approach to Smart Specialisation was set out in a submission to the European Commission by the UK Government's Department for Business Innovation and Skills (BIS) in April 2015. This document is essentially a summary of UK/English science and innovation policy and priorities. It does not specifically mention the maritime sector or 'blue economy', however it does summarise the 10 'industrial sector strategies' which include offshore wind and oil and gas. For each of the sectors, employment location quotients are provided for the English counties (for instance for oil and gas, Humber and Greater Lincolnshire are the most important 'regions', no data was provided for offshore wind, but eastern and north-eastern England are the most relevant LEP areas). In this overall framework, the LEPs were encouraged to further refine their strategic economic plan by 'embedding smart specialisation' and to concentrate resources (including ESIF) on 'a limited, realistic and relevant set of research and innovation priorities'. A [Smart Specialisation Hub](#) has been set up to support and provide advice to the LEPs in this process. Moreover, the UK Government has also launched a competitive call for funding of science and innovation audits at regional level. A first wave of [five regions](#) were awarded funding in March 2016

As an example, the Greater Lincolnshire LEP strategic economic plan (from 2014) view ports and logistics and low carbon economy as 'emerging sectors'. Actions foreseen include investment in infrastructure to support the growth of the offshore wind sector (notably a Marine Energy Park and investments in the Port of Grimsby) to support three major offshore sites. The visitor economy is another priority with coastal tourism benefiting from a significant private investment in a holiday park (the largest single investment in the region for over 10 years).

The neighbouring Humber LEP's strategic economic plan similarly targets investments in port and other transport infrastructure to support an anticipated investment in the 'Energy Estuary', serving wind farms off the Yorkshire and Lincolnshire coast. Moreover, medium term plans include carbon capture and storage and longer term potential for tidal and wave power generations. The Humber is the largest trading estuary in the UK (the ports of Hull, Immingham, Goole and Grimsby) and fourth largest in Europe with overnight links to continental European ports. The strategic plan include investment in 'Green Port Hull' enterprise zone. The area has had to contend with tidal surges and investment in coastal protection is foreseen to protect business and housing around the estuary. The blue growth concept is mentioned in relation to offshore energy but also shipping (ports), coastal tourism and seafood. Despite a decline, the region has a strong position in the seafood sector with a seafood institute and a cluster.

In **Scotland**, the Scottish Government's 2015 [Economic Strategy](#) prioritise a number of key sectors including energy and food and drink. The SG's main funding agencies

## Blue Growth Co-operation in the North Sea

(Scottish Enterprise, Highland & Islands Enterprise, The Scottish Funding Council and Skills Scotland) have operational remit to deliver specific actions by focusing on specific economic and technological priorities and opportunities and all have activities in support of blue growth sectors and priorities (such as industry led innovation centres in oil & gas and aquaculture). Marine Scotland, a directorate of the Scottish Government, is responsible for the integrated management of Scotland's seas (fishing, aquaculture, marine planning and environment, etc.).

The main Blue Growth focus areas in Scottish policy include offshore energy and related engineering technologies covering the full range of sectors from oil & gas through offshore wind to wave and tidal. Scotland's natural assets and long-run public-private investment in wave and tidal have given it a lead technology development and testing in this still pre-commercial field (notably via EMEC and the cluster of related companies in Orkney). The commercial deployment of wave energy is supported via the [Wave Energy Scotland](#) initiative.

Food and drink is a second key priority area of the Scottish Government and fishing and fishing products are an economic cluster in which Scotland has a strong specialisation. Aquaculture is a key priority (notably in the Highlands & Islands area) and the [Scottish Aquaculture Innovation Centre](#) has been funded to support the sector. Blue biotechnology related activities are also emerging and fall under the broader life science priority. The Scottish Marine Institute has a specific centre focused on blue biotech (<http://www.sams.ac.uk/biotechnology>) and the European Centre for Marine Biotechnology (<http://www.ecmb.org/index.htm>) has been developed including business incubation facilities for blue biotech firms. Blue biotechnology is one element of a drive to enhance [Scottish industrial biotechnology potential](#) (with marine biomass one focus area) is being developed. Scottish partners are active in EU FP projects in this field (e.g. <http://spider.science.strath.ac.uk/seabiotech>).

## **Sweden**

Västra Götland (West Sweden) region places a strong emphasis on the maritime economy and developing the maritime cluster as one of five regionally '[strong clusters](#)'. Within the maritime cluster, five sub-clusters are specifically supported: marine management, maritime operations and marine technology, marine biotechnology, marine energy, (wave, wind, bio), seafood and aquaculture and tourism. The region has a specific [maritime strategy](#) and the Swedish Maritime Competence Centre called [Lighthouse](#) is located in Gothenburg as well as the Swedish Maritime Technology Forum ([SMTF](#)) which represents the full spectrum of suppliers to the shipping-, offshore- and the leisure boat industry.

# Co-operation on blue growth in the North Sea basin

## 4. *Co-operation structures and funding programmes*

The North Sea area is one of the busiest maritime zones in the world and a range of organisations and co-operation networks exist that seek to address maritime spatial planning, shipping traffic and security, energy and other offshore and subsea activities as well as monitoring and seeking to enhance marine environmental quality, fish stocks, etc. The various types of co-operation include:

- Political co-operation - bilaterally and through organisations such as the North Sea Commission (a co-operation platform for local authorities and regions round the North Sea, it currently has 34 regions from eight countries).
- Maritime Spatial Planning Directive related co-operation
- Maritime monitoring, e.g. <http://noos.bsh.de/about-noos/>

A 2015 report from the UK House of Lords examined the mechanisms of co-operation and maritime planning in the North Sea and concluded that there were significant reasons to streamline and structure co-operation in order to ensure sustainable long term economic growth in the marine sectors. One example given is data with the report concluding that there is no single map or database plotting the various often conflicting use of the Sea. The report proposed the creation of a North Sea Maritime Forum to enhance collaboration but underlined the need for strong political leadership.

Adding another layer or type of co-operation to the complex set of existing structures therefore needs to be clearly justified in terms of the value added it will generate for the stakeholders concerned.

Similarly, a range of EU funding programmes provide opportunities for North Sea organisations to bid for support in pursuing joint projects. Two main funding streams are relevant for the Blue Growth theme:

- Through the European Structural Funds, territorial co-operation programmes - INTERREG, notably the North Sea Region (NSR) programme but also cross-border programmes.
- Research and technology development funding via the EU's Framework Programme (currently Horizon 2020) such as the [OCEAN ERANET](#), the [Joint Programming Initiative Ocean](#) and specific calls under Horizon 2020 (e.g. activity 2.3 unlocking the potential of aquatic living resources or activity 2.5 cross-cutting marine and maritime research).

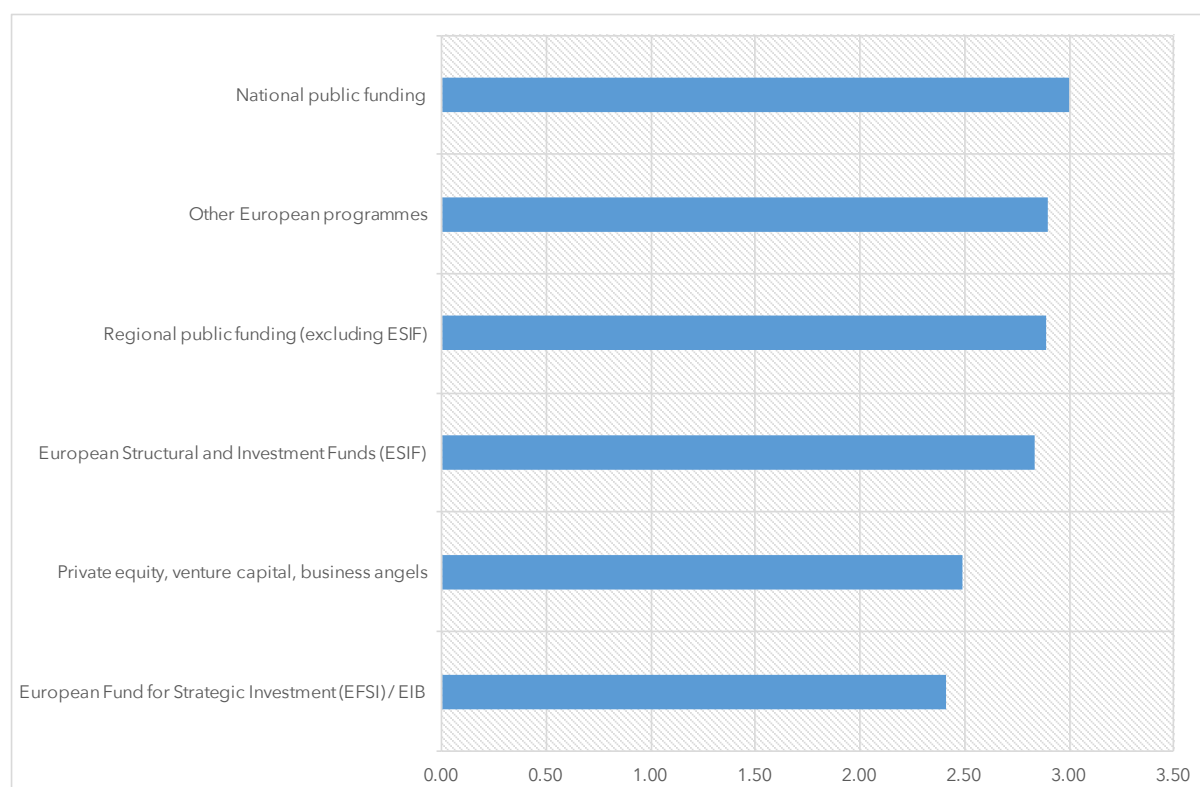
The [NSR VB Programme](#) has four priorities: 1) Thinking Growth 2) Eco-innovation 3) Sustainable North Sea Region 4) Green transport and mobility. They are detailed in specific objectives. Technically, the programme can cover all blue growth topics, provided they comply with programme objectives.

## Blue Growth Co-operation in the North Sea

Other EU programmes also support specific blue growth related topics, such as the recently launched calls by DG MARE for [Blue Careers, Blue Biotech and Blue Labs](#)

Despite the range and volume of funding available, survey respondents indicated that access to funding remains an issue with no suggested option ranking higher than three out of a scale of 5 (easily accessible). Private equity and European financial instruments such as the loans and guarantees or EFSI investment funds managed by the EIB were considered the most difficult to access. Surprisingly, 35% of respondents also considered that ESIF funds were not easy to access.

Figure 8: Ease of access to funding for blue growth projects (1 not available to 5 easily available)



Source: Survey of North Sea region stakeholders - March-May 2016. Weighted average score.

Amongst the other EU funding programmes mentioned by survey respondents the most commonly mentioned was Horizon 2020 including the OCEAN ERANET initiative, followed by INTERREG (technically this programme falls under ESIF but was clearly identified as a separate stream by respondents).

As a follow up question, participants were asked if they had faced specific difficulties in securing or combining different sources of funding in the last five years. A little over 30% of respondents indicated they had faced problems, with the remainder either unaware of or having not encountered specific problems.

The main problems identified included not unexpectedly, a series of comments underlined the need for administrative simplification, reduction of administration burdens and speeding up the procedures for project selection and payment. The INTERREG programme was most frequently mentioned in this respect. Differences

in calendars and implementation rules between different programmes were also mentioned.

Several respondents indicated difficulties in combining funding from public and private sources (with one indicating that a Horizon 2020 project was discontinued due to lack of private co-funding), from 'cross-departmental sources'. Another argued that combining H2020 funding with Structural Funds while encouraged by the Commission, is, in practice 'almost impossible'. Similar difficulties were reported in working out how to secure investment funds from the EIB. Identifying the best fit with specific programmes and in finding the right partners was an issue raised.

A number of respondents highlighted the absence of co- or matching funding from their regional government that would enable participation in inter-regional or European level initiatives. For instance, one Flemish respondent indicated that regional funding instruments are not adapted to facilitate participation in ERANET+ projects like Demowind, Oceanera, etc.

The highly competitive nature (low success rate) of Horizon 2020 as a source of funding for blue growth technology projects was pointed to by a series of respondents. Some respondents felt they had a lack of resources to even compete. It was underlined that the difficulty of accessing funding for substantial cross-border R&D cooperation was not offset within the North Sea area by funding from INTERREG or national R&D programmes which do not support such activities. Other respondents underlined difficulties in securing funding for cluster development and that access to funding for demonstration activities is difficult.

### **5. *Current co-operation patterns and barriers and drivers to co-operation***

According to the survey responses, the INTERREG IV programmes (B, A and to a lesser extent C) have been a main source of funding for blue growth related co-operation in the North Sea. The EU's research framework programme (FP7 and currently Horizon 2020) and national and regional Structural Fund programmes have been the other two main sources of funding.

A number of respondents indicated that they were involved in co-operation using national/regional public funds or joint industry (private) funds, independent of EU funding streams. Examples included funding from Innovation Norway and the Norwegian Research Council, direct financial support from Scottish Government through the [Wave Energy Scotland](#) initiative managed by Highlands & Islands Enterprise; or R&D projects funded by the Flemish Government in Belgium. Comments from specialised blue growth clusters and incubators (e.g. GreenBridge in Ghent, Flanders) underlined that they play an intermediary role in securing funding for members or incubator companies from European and national sources.

Past co-operation on blue growth has been strongly focused on offshore renewable energy notably wind (53% of respondents) and wave and tidal; followed by marine

## Blue Growth Co-operation in the North Sea

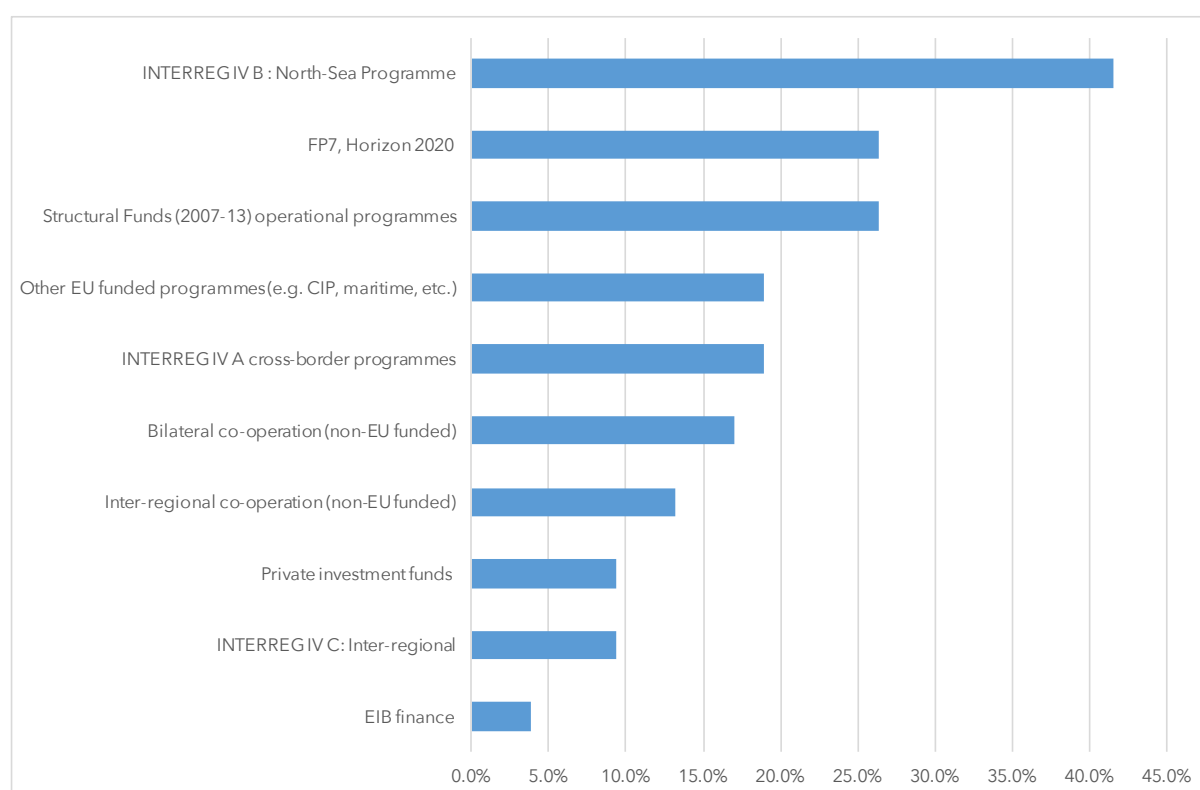
foods and aquaculture, maritime monitoring and surveillance and short-sea shipping (between 35-40% of respondents had past co-operation in these fields). Relatively few respondents reported co-operation in blue mining (marine minerals), oil & gas and blue biotechnology. A fifth of respondents reported co-operation on coastal tourism and a quarter on coastal protection.

A number of organisations were active across a range of fields such as Scottish coastal forum members who cover almost all of sectors with the exception of marine minerals and maritime monitoring and surveillance. Other, such as a Dutch association, focus on specialist coastal protection/experience activities by sharing knowledge on preserving wrecks.

No doubt reflecting the type of funding most used (INTERREG), the dominant forms of co-operation have been networking and exchange of experience (83% of respondents), followed by cluster co-operation (55%) and joint development of markets (34%). 30% of respondents have been involved in collaborative R&D (again this is coherent with the importance of FP7/H2020 as a funding source).

In contrast other forms of more 'downstream' co-operation such as demonstration actions, co-investment, product development and transnational financial instruments have been undertaken by less than 15% of respondents.

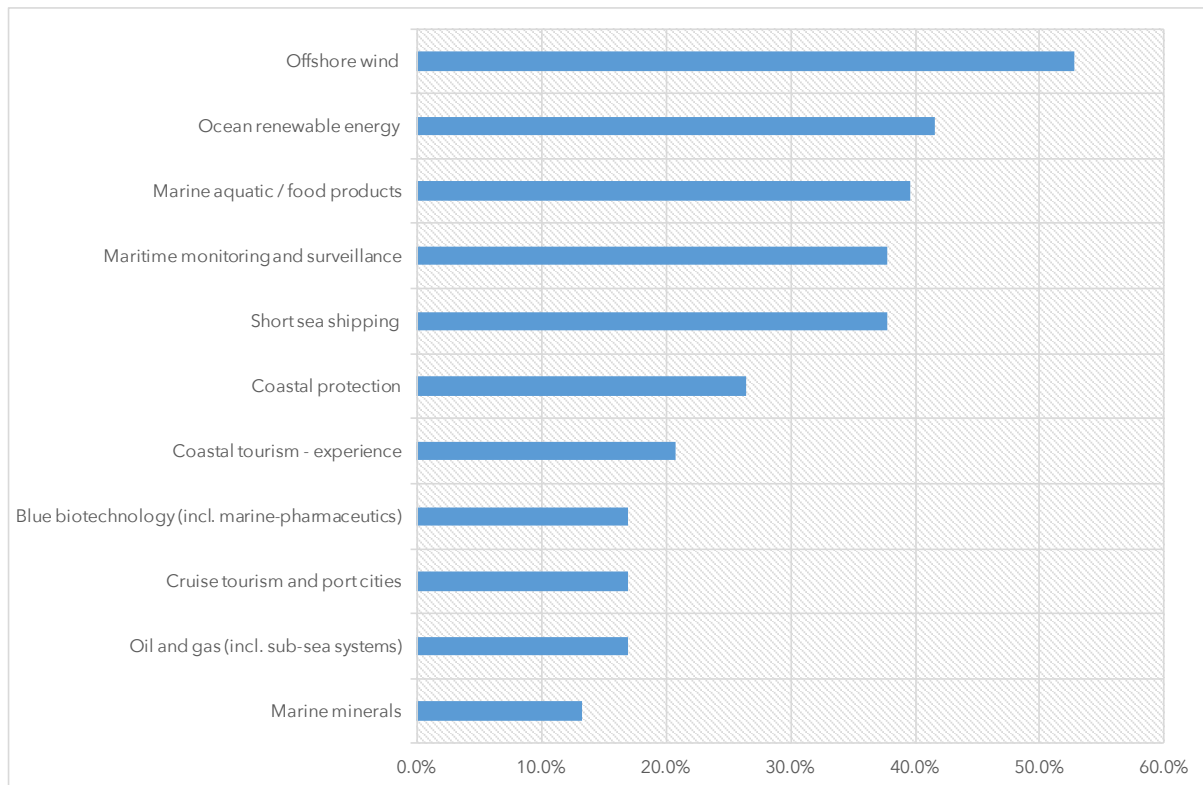
Figure 9 :Sources of funding for co-operation



Source: Survey of North Sea region stakeholders - March-May 2016

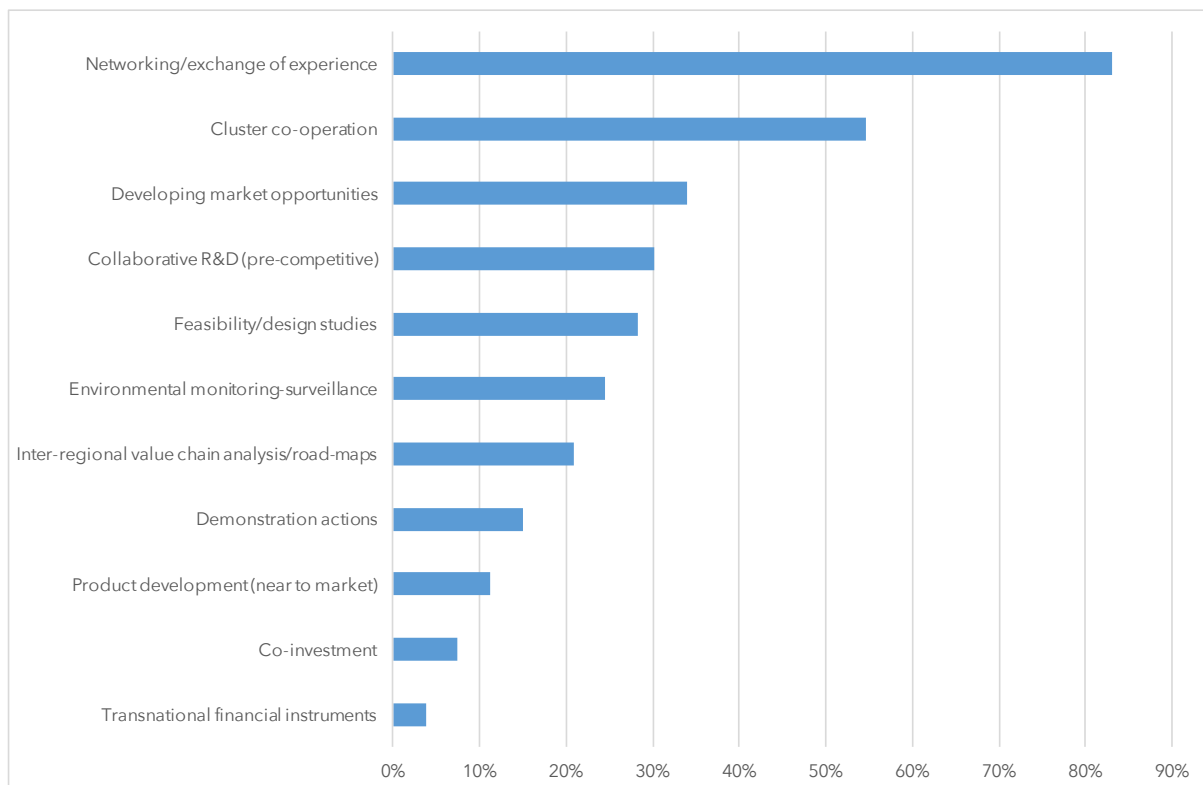
## Blue Growth Co-operation in the North Sea

Figure 10: Focus of co-operation activities by blue growth field



Source: Survey of North Sea region stakeholders - March-May 2016

Figure 11: Type of co-operation

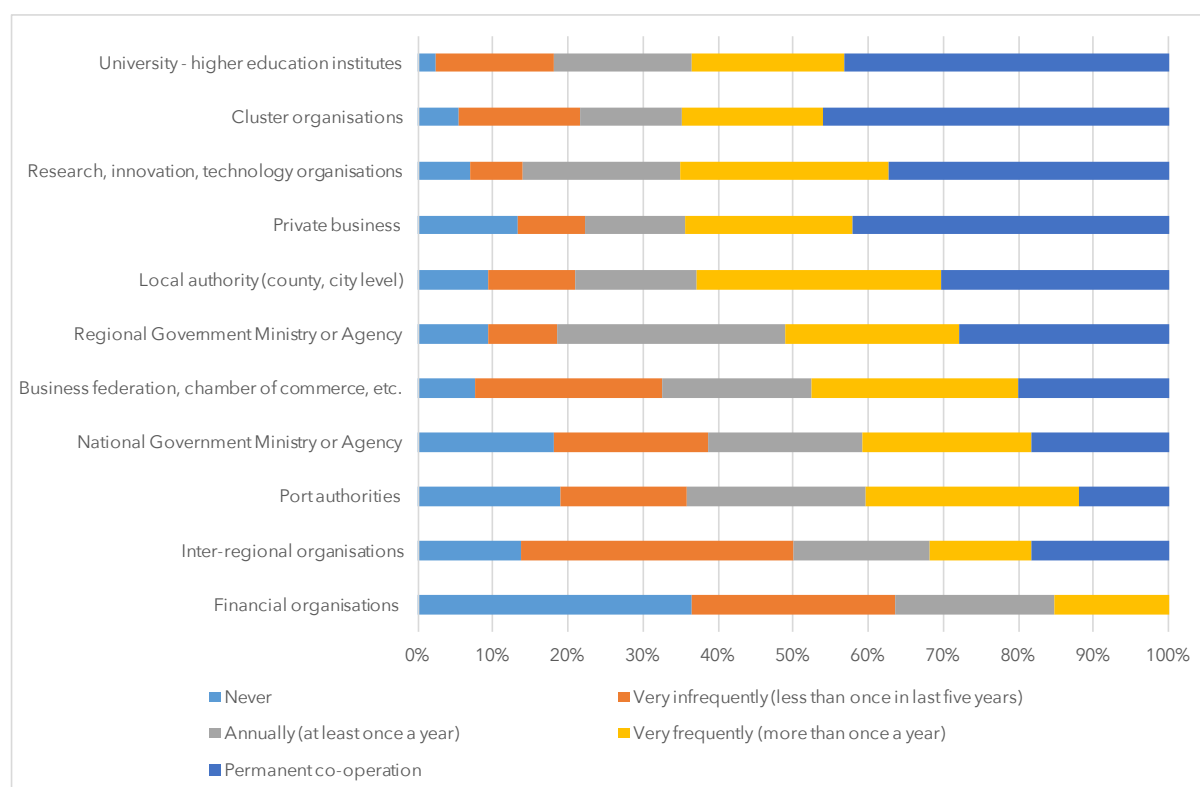


Source: Survey of North Sea region stakeholders - March-May 2016



## Blue Growth Co-operation in the North Sea

Figure 12 : Frequency of co-operation with different types of partners



Source: Survey of North Sea region stakeholders - March-May 2016

Survey respondents were also asked to indicate with which regions they had co-operated with in the last five years. A total of 54 regions were selected at least once as co-operation partners by respondents, however the most intense co-operation has been with the top 20 regions listed in the table below. These include the main Belgian, Danish, Dutch, German, Norwegian and Scottish North Sea regions.

Figure 13: top 20 most frequently cited partner regions

Region	Percent of respondents co-operating
NL11 Groningen	34.0%
DE50 Bremen	30.2%
DE60 Hamburg	30.2%
NL33 Zuid-Holland	30.2%
NO04 Agder Og Rogaland	30.2%
UKM2 Eastern Scotland	30.2%
BE25 Prov. West-Vlaanderen	28.3%
NL32 Noord-Holland	28.3%
BE23 Prov. Oost-Vlaanderen	26.4%
DEF0 Schleswig-Holstein	26.4%
NL34 Zeeland	26.4%
UKM5 North Eastern Scotland	26.4%
UK M6 Highlands and Islands	26.4%
NO01 Oslo Og Akershus	24.5%
NO05 Vestlandet	24.5%

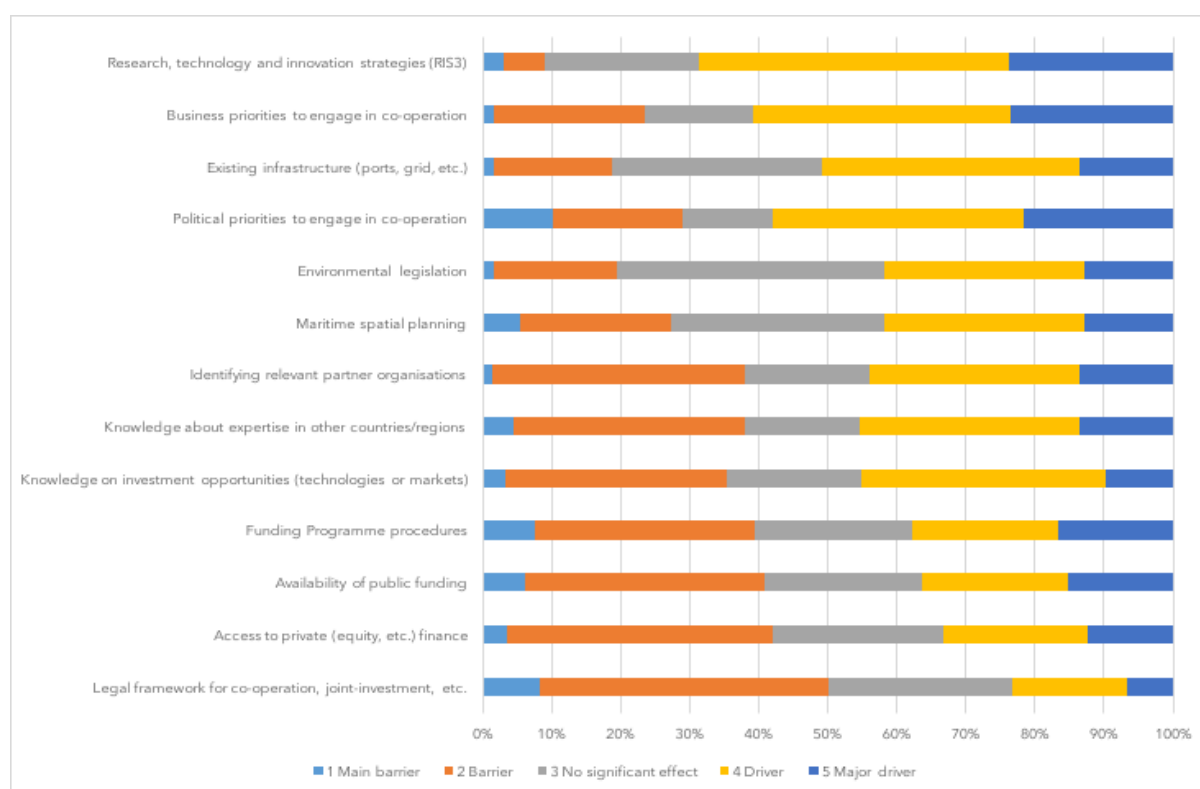
## Blue Growth Co-operation in the North Sea

Region	Percent of respondents co-operating
DK04 Midtjylland	22.6%
NL12 Friesland	22.6%
DK05 Nordjylland	20.8%
DK03 Syddanmark	18.9%
NO06 Trøndelag	18.9%

Source: Survey of North Sea region stakeholders - March-May 2016

The pattern of regional co-operation partners is coherent with the focus on activities in offshore wind, wave and tidal, marine food and short-sea shipping.

Figure 14: main barriers and drivers to co-operation in the field of blue growth



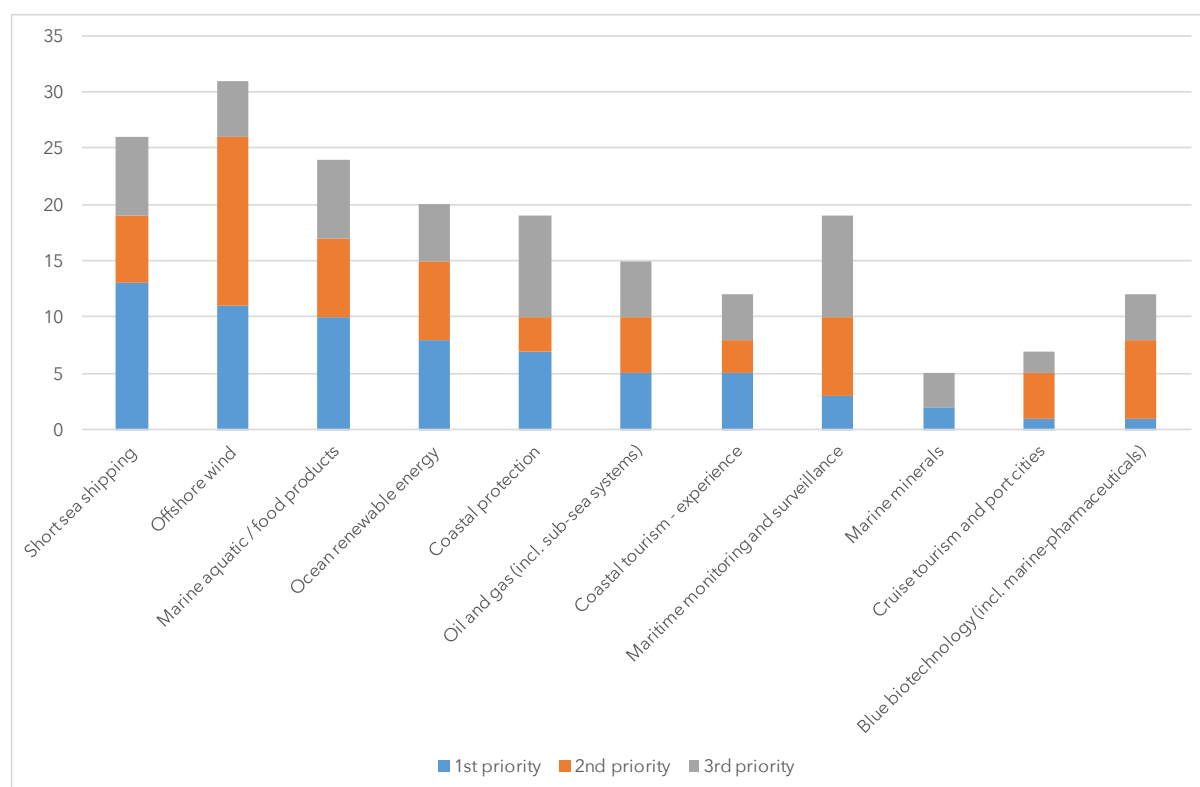
Source: Survey of North Sea region stakeholders - March-May 2016

Survey respondents were asked to rank the main barriers to co-operation in the field of blue growth and the responses suggest that the legal framework for co-operation, access to private finance, availability of public funding and funding programme procedures are the main barriers. In contrast, the existing of a strategic framework for the blue economy and strong political and business priorities are viewed as key drivers. Environmental legislation and maritime spatial planning are considered on average to be a driver rather than a barrier to co-operation.

## Future priorities and options for strategic co-operation

The survey respondents were asked to rank their top three priorities in blue growth field with the final ranking differing slightly in terms of whether the priorities are ranked by weighted average or first preference (short sea shipping top for both) or total 'votes' (offshore wind top). Third place is clearly secured by marine food and aquaculture products. Grouping the inter-linked coastal protection and coastal tourism and experience topics provides a fourth main priority for future co-operation. Coastal protection is, of course, also related to adapting to climate change as one comment pointed out.

Figure 15: blue growth priorities of North Sea region organisations (survey response)



Source: Survey of North Sea region stakeholders - March-May 2016

Within the topic of short-sea shipping, several comments underlined the need to focus on sustainable (or green) shipping (under short sea shipping) including maritime energy saving and optimisation. One comment suggested that only focusing on shipping was not enough with a broader topic of sustainable transport/mobility suggested including land transport/ not only as hinterland connections. Conversely, cruise tourism and port cities were relatively lowly ranked, with the vagaries of the North Sea weather perhaps a dissuading factor. However, a respondent pointed to port infrastructure as a blue growth business opportunity.

Energy is a broad priority as the combined preferences for offshore wind and ocean renewable energy (wave and tidal) suggest a strong interest in further investment and development in marine renewable energy. Indeed, several respondents

suggested that it would be preferable to consider “offshore renewable energy as a single topic”. A related issue raised is the need for interlinking of (electricity) grids. Oil & gas co-operation was less highly prioritised (underlining perhaps the competitive nature of this mature sector) but in overall terms adds to the weight of the ‘energy portfolio’.

The relatively high number of votes for maritime monitoring and surveillance were reflected in several comments submitted by survey respondents. One respondent noted that land/sea interactions in relation to marine planning should be given priority, as the different maritime spatial planning (MSP) regimes around the North Sea may affect the ability of strategic cooperation to be delivered effectively. Another suggested there was a need to consider the impact of Maritime Spatial Planning and of the Marine Strategy Framework Directive on Blue Growth. A third underlined the issue of the “multi-use of space, co-location, co-development across blue growth sectors, risk-sharing”. Another commentator underlined that operational oceanography as a stimulator to ensure the safety and efficiency of Blue Growth should be addressed.

In contrast, marine mineral (blue mining) and blue biotech both were given relatively low priority, an indication, perhaps, that their classification by the Ecorys study as still in a ‘pre-development’ phase is correct. However, a number of commentators underlined that certain technologies relevant for such ‘emerging fields’ are also critical to more mature or growing blue growth sectors. One example is subsea operations which is not specific to offshore wind, marine minerals, ocean renewable energy or marine food products. Across all these sectors there is a need for similar operations like anchor handling, service ships, subsea operations (welding and mounting). Both building and running ships for these operations require advanced competence as well as relative knowledge intensive services (design, consultancy, financial and legal services).

Hence, one suggestion is to focus on knowledge and technology transfer between sectors or of a cross-cutting nature that underpins broader blue growth potential.

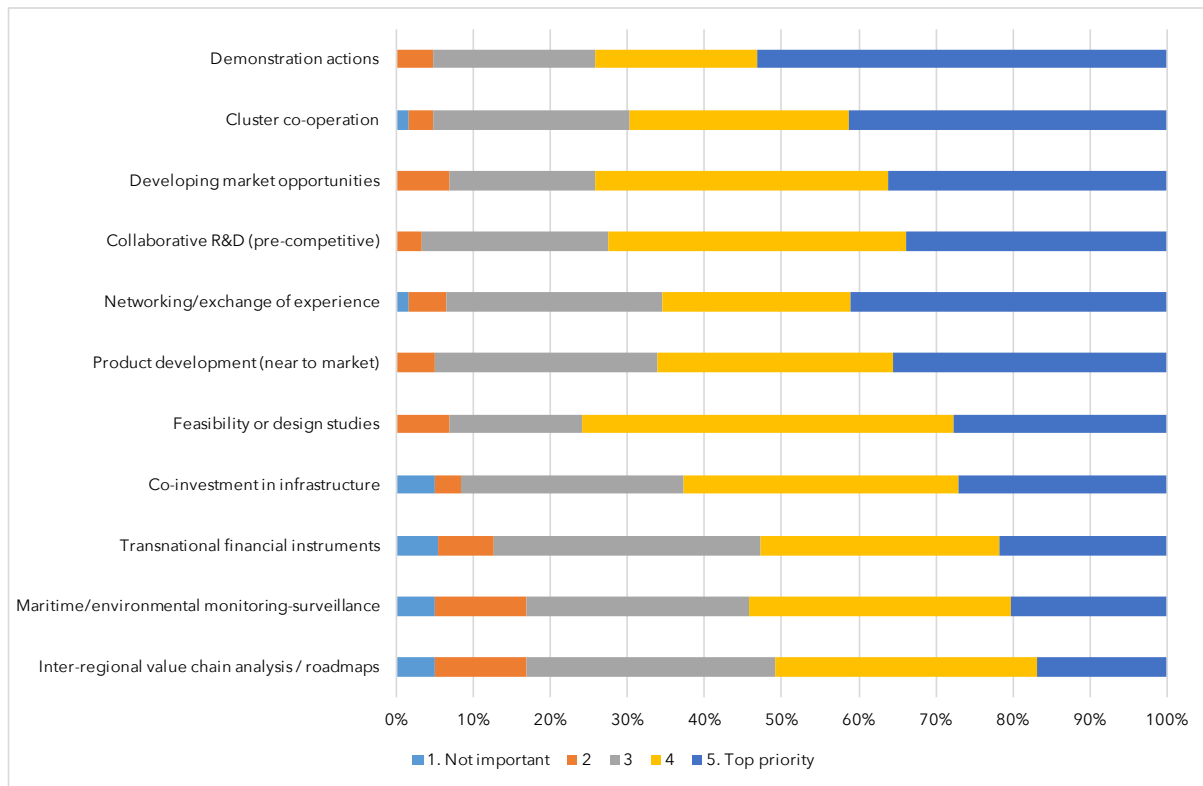
The survey then asked respondents to prioritise the type of co-operation activities they considered optimal in the future. The results show a clear switch from the past pattern of co-operation (strong emphasis on networking and exchange of experience) towards more structured co-operation through demonstration actions, cluster link-ups, joint market development and collaborative R&D.

Somewhat surprisingly given results of previous questions on barriers to co-operation a relatively low priority was given to transnational financial instruments. Maritime monitoring and surveillance was also given a lower priority, however, this may reflect the respondents’ direct interests and the existing structured co-operation in the field. Finally, inter-regional value chain co-operation was not considered a priority, despite the recent success of the [Vanguard Initiative](#) in

## Blue Growth Co-operation in the North Sea

developing co-operation in offshore technologies. This may reflect a lack of understanding of this emerging concept.

Figure 16: future priorities in terms of type of co-operation activities



Source: Survey of North Sea region stakeholders - March-May 2016

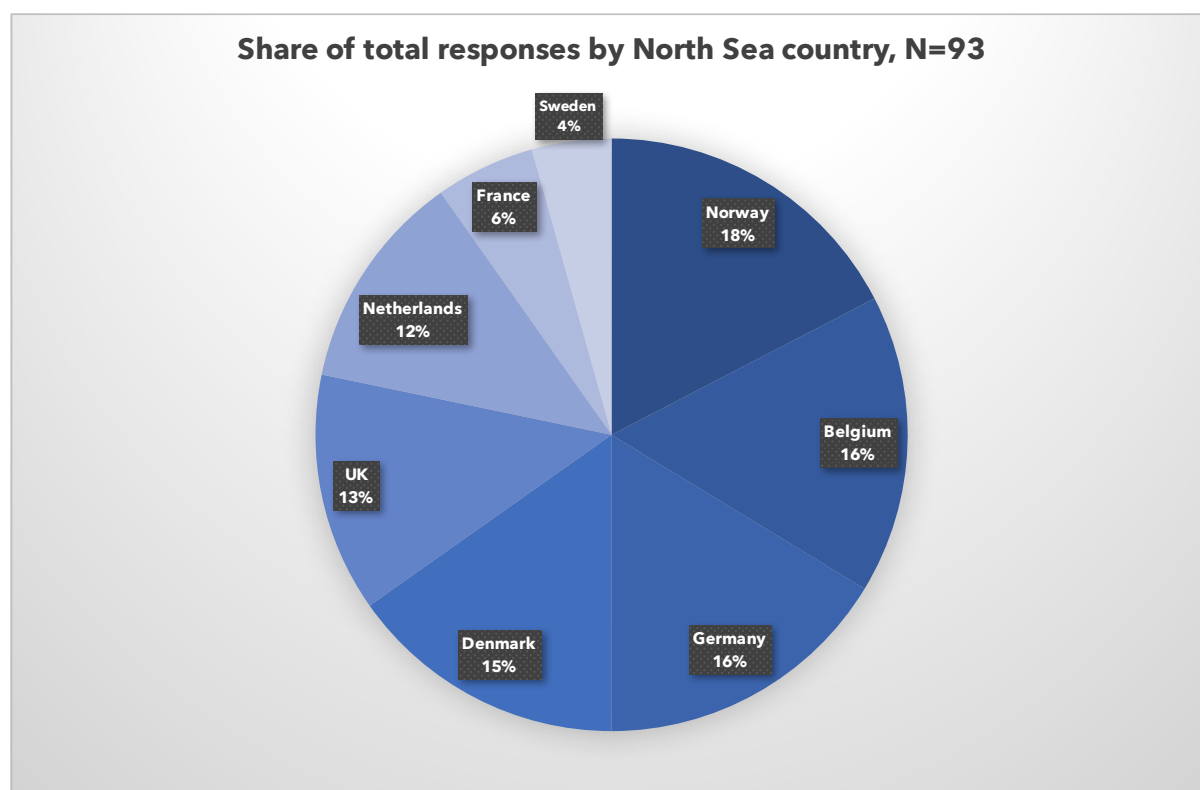
## Appendix A : List of North Sea regions

BE21 Prov. Antwerpen	NO01 Oslo Og Akershus
BE23 Prov. Oost-Vlaanderen	NO02 Hedmark Og Oppland
BE25 Prov. West-Vlaanderen	NO03 Sør-Østlandet
DK01 Hovedstaden	NO04 Agder Og Rogaland
DK02 Sjælland	NO05 Vestlandet
DK03 Syddanmark	NO06 Trøndelag
DK04 Midtjylland	NO07 Nord-Norge
DK05 Nordjylland	SE22 Sydsverige (Skåne län)
DE50 Bremen	SE21 Småland med öarna (Kronobergs län)
DE60 Hamburg	SE23 Västsverige
DE91 Braunschweig	UKC1 Tees Valley and Durham
DE92 Hannover	UKC2 Northumberland and Tyne and Wear
DE93 Lüneburg	UKE1 East Yorkshire and Northern Lincolnshire
DE94 Weser-Ems	UKE2 North Yorkshire
DEF0 Schleswig-Holstein	UKE3 South Yorkshire
FR30 Nord - Pas-de-Calais	UKE4 West Yorkshire
FR22 Picardie	UKF1 Derbyshire and Nottinghamshire
FR23 Haute-Normandie	UKF2 Leicestershire, Rutland and Northamptonshire
FR25 Basse-Normandie	UKF3 Lincolnshire
FR52 Bretagne	UKH1 East Anglia
NL11 Groningen	UKH3 Essex
NL12 Friesland	UKJ4 Kent
NL13 Drenthe	UKM5 North Eastern Scotland
NL21 Overijssel	UKM2 Eastern Scotland
NL23 Flevoland	UK M6 Highlands and Islands
NL32 Noord-Holland	
NL33 Zuid-Holland	
NL34 Zeeland	

## Appendix B : Overview of survey respondents

The distribution of survey respondents by country is relatively representative with the main North Sea countries each contributing at least 10% of respondents.

Figure 17: survey respondents by North Sea country



Source: Survey of North Sea region stakeholders - March-May 2016

Fewer responses were received from France and Sweden, however, these two countries have only a limited coastal territory bordering the North Sea. Four or more responses were received from organisations based in the following regions:

DK01 Hovedstaden

DEF0 Schleswig-Holstein

NO05 Vestlandet

DK05 Nordjylland

BE1 Brussels-Capital

FR30 Nord - Pas-de-Calais

NL33 Zuid-Holland

NL32 Noord-Holland

BE23 Prov. Oost-Vlaanderen

NO01 Oslo Og Akershus

DE50 Bremen

UKM2 Eastern Scotland

DE94 Weser-Ems

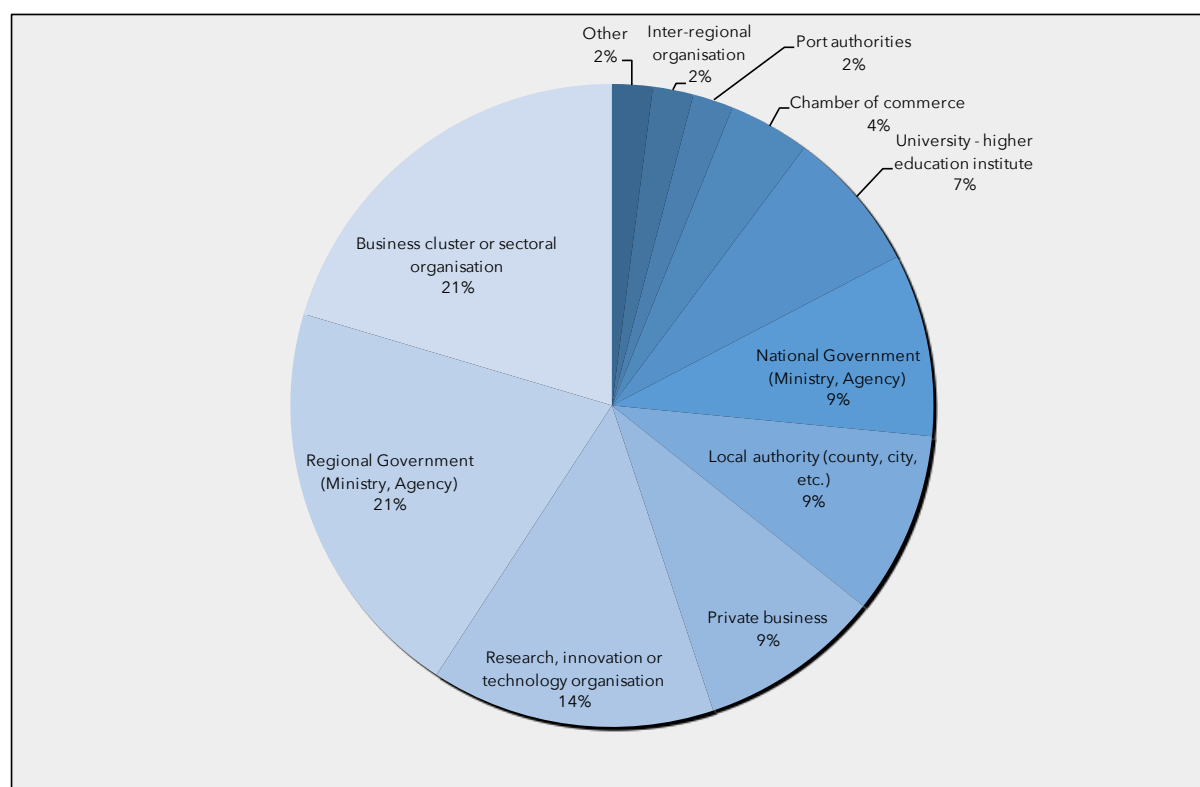
Based on initial response rates, a direct mailing of English Local Enterprise Partnerships was made to increase the response rate from English North Sea regions, however, the response rate for the English regions remained low. A

## Blue Growth Co-operation in the North Sea

number of responses were received from organisations based beyond the North Sea including from the Basque Country, Emilia Romagna and Western Greece.

The survey was targeted at a broad range of organisations based on a mailing list compiled with the assistance of DG MARE. A principal objective of the survey was to collect the views of business cluster or sectoral (e.g. maritime industry) organisations. Over a fifth of respondents corresponded to this categorisation and private businesses also responded directly or via chambers of commerce type organisations.

Figure 18 : survey respondents by type of organisation



Source: Survey of North Sea region stakeholders - March-May 2016

Research, technology and higher education type organisations accounted for another 21% of responses. Government (national, regional or local) departments or their agencies provided close to 40% of responses.



## Appendix C : Clusters in the North Sea regions

Figure 19: list of clusters by topic - North Sea area

<b>Cluster/organisation name</b>	<b>Blue growth primary focus</b>	<b>Internet site</b>	<b>Country</b>
LifeScience Nord	Blue biotechnology (incl. marine-pharmaceuticals)	<a href="http://www.lifesciencenord.de/en/start/">http://www.lifesciencenord.de/en/start/</a>	Germany
Clean Water Norway	Coastal protection	<a href="http://www.vannklyngen.no">http://www.vannklyngen.no</a>	Norway
Smart Water Cluster	Coastal protection	<a href="http://smartwatercluster.no/">http://smartwatercluster.no/</a>	Norway
Water Alliance	Coastal protection	<a href="http://wateralliance.nl/">http://wateralliance.nl/</a>	Netherlands
NCE Tourism Fjord Norway	Coastal tourism/sports	<a href="http://no.fjordnorway.com/nce">http://no.fjordnorway.com/nce</a>	Norway
InnoSport Lab DenHaag	Coastal tourism/sports	<a href="http://www.innosportlabdenhaag.nl/en-den Haag">http://www.innosportlabdenhaag.nl/en-den Haag</a>	Netherlands
Aquimer	Marine aquatic / food products	<a href="http://www.poleaquimer.com/fr/aquimer/Plan-d-acces.html">http://www.poleaquimer.com/fr/aquimer/Plan-d-acces.html</a>	France
NCE Aquaculture	Marine aquatic / food products	<a href="http://nceaquaculture.com/">http://nceaquaculture.com/</a>	Norway
Future Food Innovation	Marine aquatic / food products	<a href="http://www.futurefoodinnovation.dk//default.asp?page_id=194">http://www.futurefoodinnovation.dk//default.asp?page_id=194</a>	Denmark
Arena Ocean of Opportunities	Marine aquatic / food products	<a href="http://arenaoceanofopportunities.no/">http://arenaoceanofopportunities.no/</a>	Norway
NieKE Lower Saxony Agrifood Competence Centre	Marine aquatic / food products	<a href="http://www.ernaehungswirtschaft.de/en/">http://www.ernaehungswirtschaft.de/en/</a>	Germany
Scottish Aquaculture Innovation Centre	Marine aquatic / food products	<a href="http://scottishaquaculture.com/">http://scottishaquaculture.com/</a>	Scotland
Pôle Mer Bretagne	Multi-topic	<a href="http://www.pole-mer-bretagne-atlantique.com/">http://www.pole-mer-bretagne-atlantique.com/</a>	France

## Blue Growth Co-operation in the North Sea

<b>Cluster/organisation name</b>	<b>Blue growth primary focus</b>	<b>Internet site</b>	<b>Country</b>
Cluster Maritime Français	Multi-topic	<a href="http://www.cluster-maritime.fr">http://www.cluster-maritime.fr</a>	France
Wirtschaftsförderung und Technologietransfer Schleswig-Holstein GmbH	Multi-topic	<a href="https://wtsh.de/branchen-und-cluster/">https://wtsh.de/branchen-und-cluster/</a>	Germany
Flanders Maritime Cluster	Multi-topic	<a href="http://www.flanders-maritime-cluster.be/">http://www.flanders-maritime-cluster.be/</a>	Belgium
Maritima klustret i Västra Götaland	Multi-topic	<a href="http://maritimaklustret.se/english/">http://maritimaklustret.se/english/</a>	Sweden
Marine SouthEast	Ocean renewable energy	<a href="http://www.marinesoutheast.co.uk/">http://www.marinesoutheast.co.uk/</a>	England
Orkney Renewable Energy Forum	Ocean renewable energy	<a href="http://www.oref.co.uk/">http://www.oref.co.uk/</a>	Scotland
Offshoreenergy.dk	Ocean renewable energy	<a href="http://www.offshoreenergy.dk/">http://www.offshoreenergy.dk/</a>	Denmark
Danish Wind Industry Association (DWIA)	Offshore wind	<a href="http://www.windpower.org/en/">http://www.windpower.org/en/</a>	Denmark
Hub North	Offshore wind	<a href="http://www.hubnorth.dk/">http://www.hubnorth.dk/</a>	Denmark
WindenergieAgentur Bremerhaven e. V.	Offshore wind	<a href="http://www.wab.net/">http://www.wab.net/</a>	Germany
EE.SH - Erneuerbare Energien Schleswig-Holstein	Offshore wind	<a href="http://www.ee-sh.de/">http://www.ee-sh.de/</a>	Germany
GCE Norwegian Offshore & Drilling Engineering	Oil and gas (including sub-sea systems, etc.)	<a href="http://gcenode.no">http://gcenode.no</a>	Norway
NCE Subsea	Oil and gas (including sub-sea systems, etc.)	<a href="http://www.ncesubsea.no/">http://www.ncesubsea.no/</a>	Norway
SubSea Valley	Oil and gas (including sub-sea systems, etc.)	<a href="http://subseavalley.com/">http://subseavalley.com/</a>	Norway

## Blue Growth Co-operation in the North Sea

<b>Cluster/organisation name</b>	<b>Blue growth primary focus</b>	<b>Internet site</b>	<b>Country</b>
Oil & Gas Innovation Centre	Oil and gas (including sub-sea systems, etc.)	<a href="http://www.ogic.co.uk/">http://www.ogic.co.uk/</a>	Scotland
North East Process Industry Cluster	Production/engineering	<a href="http://www.nepic.co.uk/">http://www.nepic.co.uk/</a>	England
Artic Maritime Cluster	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://arena-amk.no/">http://arena-amk.no/</a>	Norway
Fyns Maritime Klynge	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://www.fynsmaritimeklynge.dk/">http://www.fynsmaritimeklynge.dk/</a>	Denmark
Marcod	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://www.marcod.dk/">http://www.marcod.dk/</a>	Denmark
Maritime Cleantech West	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://www.maritimecleantech.no/content.aspx?page=105062">http://www.maritimecleantech.no/content.aspx?page=105062</a>	Norway
Swedish Maritime Technology Forum	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://smtf.se/en/">http://smtf.se/en/</a>	Sweden
Logistik-Initiative Hamburg	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://www.hamburg-logistik.net/en/start.html">http://www.hamburg-logistik.net/en/start.html</a>	Germany
Maritime Cluster Northern Germany (MCN)	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://www.maritimes-cluster.de/">http://www.maritimes-cluster.de/</a>	Germany

## Blue Growth Co-operation in the North Sea

<b>Cluster/organisation name</b>	<b>Blue growth primary focus</b>	<b>Internet site</b>	<b>Country</b>
Maritime Development Centre	Short sea shipping (ship building, shipping technologies, port infrastructure, and logistics)	<a href="http://maritimecenter.dk">http://maritimecenter.dk</a>	Denmark

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