



Support activities for the development of maritime clusters in the Mediterranean and Black Sea areas

Final Report under FWC MARE/2012/06 –
SC D1/2013/01

Client: DG Maritime Affairs and Fisheries

Brussels/Berlin/Athens

29th August 2014



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Executive summary

Why maritime clusters matter in the Mediterranean and Black Sea regions

Blue Growth provides enormous potential for smart, sustainable and inclusive economic and employment growth. Nevertheless, each of Europe's sea-basins has its own economic, social, environmental, geographic, climatic and institutional characteristics, and each will contribute in its own way to a differentiated Blue Growth path.

Within this context, there is a clear added value for the European Union to understand better the synergies, coordination and internationalisation in the Mediterranean and Black Sea regions that potential intra- and inter-maritime cluster cooperation could bring. With competitiveness levels of many, especially Southern EU countries having been challenged by the economic crisis, the timing for a new, less fragmented, maritime cluster strategy is greater than ever.

This project was tasked to provide policy makers at the EU and sea-basin levels **an updated analysis of the current status and potential development** of maritime clusters in the Mediterranean and Black Sea areas. In doing so, we take into consideration the coastlines of EU Member states and non EU countries. This includes a sub-region geographical approach, allowing a better grasp of the specific elements of the Western Mediterranean, Adriatic-Ionian, Central Mediterranean, Eastern Mediterranean, as well as the Black Sea area.

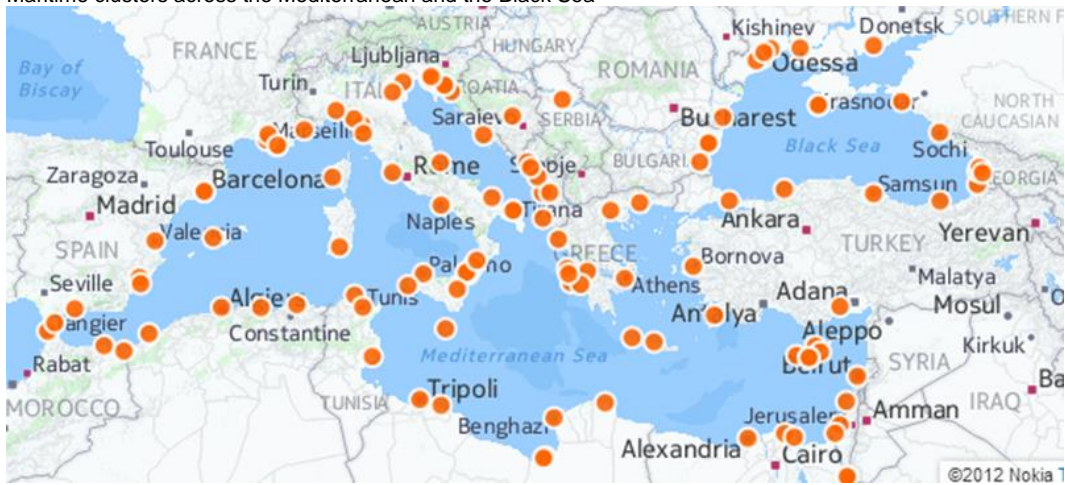
The study comprises **seven consecutive tasks**. It starts with the establishment of a list of existing clusters in the field of the maritime economy, in both the Mediterranean and the Black Sea, including clusters in both EU and non-EU countries. This overview has been provided in two stages: a broad inventory of 117 clusters (Phase A); and, a more in-depth inventory and analysis of 19 selected clusters (Phase B).

The analysis of the clusters has resulted in a shortlist of six maritime clusters that together provide a balanced package: Marine cluster Bulgaria, Pôle Mer Méditerranée (France), NAPA (Adriatic), Piraeus (Greece), Idimar (Balears, Spain) and AgroBioFishing cluster Palermo (Italy). Focus groups have been held in each of these clusters with the aim of validating the results, and to acquire concrete knowledge regarding the challenges and potentials of specific clusters. The six local focus groups have been complemented by a Brussels-based focus group on governance. Out of these activities five case studies have been produced, centred around carefully chosen topics that are at the heart of maritime cluster governance and that are of use to a broader set of cluster actors, including policy-makers at all levels. The findings from the above tasks have prepared the ground for the realisation of a two-day international workshop with stakeholders in order to share and discuss policy lessons. These insights have been used to prepare this Final Report.

Maritime cluster patterns

As a first step an **inventory of maritime clusters** was made on the basis of four criteria: a) critical mass; b) existence of several maritime economic activities; c) existence of research, training and other supporting infrastructures; and, d) the potential for future development. The inventory highlighted an **extraordinary variety of maritime actors and activities**. An overview of the localisation of the 117 clusters is represented in Figure 0.1.

Figure 0.1 Maritime clusters across the Mediterranean and the Black Sea



Source: Specifically elaborated for this study

Clusters go through life cycle stages and we distinguish between mature, growing, emerging, mature and stable/declining clusters. Overall, **almost half of the clusters mapped (48%) can be considered growing**, while 29% are mature, and 17% are emerging. Differences between EU and non-EU clusters mapped are strong. Whilst the EU clusters mapped present a more balanced ratio between mature, growing and emerging clusters, **two out of three of the non-EU clusters mapped have been classified as growing**. Although only indicative, this finding could indicate that maritime growth in the Mediterranean and Black Sea region could come from the non-EU side – perhaps more so than from the EU itself.

Innovative maritime sectors are underrepresented in the mapped clusters. Indeed, a strong concentration around similar and rather traditional activities can be observed across the clusters mapped, the most relevant being: short-sea shipping; coastal tourism; cruise tourism; shipbuilding and ship repair; deep-sea shipping; passenger ferry services; and, catching fish for human consumption. This concentration appears to be typical for the Mediterranean and Black Sea regions, whereas other sea-basins tend to display a more varied and diverse picture¹. Hence, this limited variety and the focus on traditional maritime economic activities could be regarded as a possible sign of limited innovation in the Mediterranean and Black Sea regions.

The five sub-regions follow a broadly similar pattern, with some variety:

- In the **Black Sea** area, the shipbuilding and the oil & gas sectors are particularly relevant, and this is the only region where inland water transportation appears between the main Maritime Economic Activities;
- Tourism, either coastal or cruise tourism, is by far the most common activity of **East Med** clusters;
- The **Adriatic-Ionian** sub-region shows the highest heterogeneity, with a higher diversification of activities. Aquaculture scores above the overall average while cruise tourism is under-represented in the clusters of this sub-region;
- In the **Central Med** sub-region, clusters score above the average in short-sea shipping, cruise tourism, deep-sea shipping and passenger ferries; and
- In the **West Med** sub-region, a strong focus on deep-sea shipping, shipbuilding and yachting can be observed.

¹ See *Blue Growth, Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts*, chapters 4 and 5 http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/blue_growth_third_interim_report_en.pdf.

Estimating the size of clusters is complex, as each cluster has its own definitions and as these do not correspond to statistical data on sectors or regions. Nevertheless we have attempted to arrive at average numbers of estimated companies per cluster. Across the Mediterranean & Black Sea (in EU and non-EU together), we have arrived at an approximation of **600-700 thousand people** potentially employed in maritime clusters, of which the East Mediterranean, West Mediterranean and Adriatic sea-basin provide the bulk. Depending on the weight between EU- and non-EU parts of the sea-basin, it can be assumed that about third to half of all maritime economic activities in the sea-basin can be found in (potential) formal and informal clusters.

Exploiting the benefits of maritime clusters

A key finding of the study is that actors in the Mediterranean and Black Sea region are increasingly aware of the need to **construct competitive advantage through maritime clusters** – and that this is a trial and error process. There is no ‘one size fits all’ and not one ‘silver bullet’ process to build a cluster. Maritime clusters are not fundamentally different from other clusters, although their limited critical mass makes it more difficult to pursue specialisation strategies. Mainstream cluster policy tends to focus on specialisation. After all, the maritime economy is more limited in size and many maritime economic activities take place in less populated zones, including peripheral regions, and islands. Indeed, **diversification appears to be key in maritime cluster development**.

When comparing the mapped **maritime clusters in the Mediterranean & Black Sea** with the features of maritime clusters in northern EU (e.g. North Sea, Baltic Sea), some specific elements can be identified. These clusters experience less favourable macro-economic conditions, they tend to be smaller in size and have less limited critical mass, they have a lower degree of maturity, and they have a higher presence of informal clusters.

The concept of (maritime) clusters revolves around mechanisms to increase productivity, growth and jobs. This is achieved by producing externalities or synergies that can be grouped into:

- **Business-to-business and research cooperation.** This involves new forms of cooperation across sectors, and building new value chains of products and services. Proximity helps to boost such cooperation, but cluster activities can further enhance this process. The triple helix approach involving business, research and government actors is a powerful concept in this respect;
- **Competency development and knowledge sharing.** Clusters provide a locus for the labour market, retention and development of skills which are essential for building competitive advantages, and which extend beyond the borders of individual firms. Those able to attract the best skills have a decisive advantage over others. Cooperation with specialised educational institutes in the area of training are of mutual advantage;
- **Marketing and visibility.** Joint promotion of the cluster, its members and their products and services internationally is an important synergy and an important reason for companies to collaborate;
- **Smart infrastructure and planning.** Maritime clusters require by definition the sharing of infrastructure, including ports, inland infrastructure as well as zoning of activities. Not all maritime economic activities go well together, and intelligent and integrated physical as well as maritime planning are required to prevent tensions; and
- **Trans-boundary cooperation.** In its form of cross-border, transnational and international cooperation, it enables access to markets, allows clusters to jointly address future challenges, and supports benchmarking and learning.

Bringing about the above synergies requires above all **professional cluster management**, supported by the time and dedicated efforts by skilled support staff.

Roadmap for policy makers

Building and developing successful maritime clusters is complex. It requires a large number of actors to cooperate, both public and private. It requires a good policy framework, critical mass, a willingness to work together, to trust good management and leadership, and a clear view of the opportunities and challenges ahead and how to address these. There is much experience in building and developing clusters from Europe as well as from around the world – including maritime clusters – and it is crucial to learn from these experiences and take account of existing support structures when working towards the above ambition. While there is no need to ‘reinvent’ wheels, there are no standard recipes for building and managing maritime clusters in the Mediterranean and Black Sea regions. Situations are very different, and care should be taken in ‘copying’ standard practices from other very different situations. Equally, it is important to recognise that not all maritime clusters can be ‘world class’, as many will be successful at a lower geographical scale, at sea-basin, national or regional level.

Policy makers should know when to support maritime clusters (and when not). For this they need to carefully map and identify relevant local maritime clusters, and put in place instruments and tools to support their emerging phase. There is also need for an agreement on performance targets for clusters in an early stage, and conditionality criteria for support. Policy makers will need to know: How many members will be required by when; How many start-up companies or jobs are aimed for; What other success indicators can be applied, such as export performance, increased visibility, competence development and trans-boundary cooperation; and, what will be the extent to which costs are covered. There is justification for longer term cluster support, providing that benefits clearly arise for the members directly involved. But this argument can never be used for writing a ‘blank cheque for longer periods of time. Instead, agreements about co-financing rates in a longer time frame make much sense. It is vital to recognise that public resources should be also allocated to support emerging clusters, so that they can achieve a critical mass and become self-sufficient.

Action line 1: Foster an effective policy framework. Maritime clusters cannot prosper in isolation and they need to be embedded in local, regional, national and sea-basin specific strategies and policies. It helps particularly when they are part of formal and powerful cluster concepts, as in the “pôles de compétitivité” in France. Absence of such frameworks and policies hinders the development of a cluster. A coherent macro- and meso-policy framework is vital for the development of maritime clusters as well. It is also crucial that governance levels are aligned and that efforts are made towards multi-level governance. Equally, policies need to take into account sub-regional specificities.

For this, every policy level needs to play its own role. Maritime cluster development touches upon a range of government policies, ranging from transport, economic policy, environmental policy and physical planning all the way to skills development, education, employment and safety regulations. Maritime clusters can also be a powerful resource for policy makers, as they are a unique platform for business, education, research and government to meet and exchange. Well-functioning clusters have clear views on the longer term needs of their members and partners, and have engaged in ‘horizon scanning’ and are therefore an important resource when preparing policy. It is also important to acknowledge maritime clusters in implementing existing (funding) initiatives, and to take specificities of maritime clusters into account when implementing existing (funding) initiatives.

Sea-basin strategies are a lever for promoting maritime focus of policy makers. They have the potential to steer EU funding by setting themes and priorities. The development of the Adriatic-Ionian sea-basin strategy has demonstrated that sea-basin strategies can foster the awareness of the maritime economy amongst national and regional policy makers. Such international strategies will help maritime clusters to be acknowledged and recognised. They will be seen as part of a larger network rather than an isolated group of companies and institutes.

Action line 2: Enable competency development and knowledge sharing. A low-cost / low-wage strategy is not promising in the medium- and long-term, because large enterprises attracted by low costs may delocalise sooner or later to other low-cost countries. Maritime clusters are an effective and powerful tool to prevent such delocalisation. But in the Mediterranean and Black Sea regions, maritime clusters tend to focus on more traditional maritime economic activities. The identification of competency and knowledge gaps which prevent clusters addressing future opportunities, constitutes a major challenge for the region.

We therefore recommend to launch specific calls addressing the competency and knowledge gaps in the region. Specific calls for proposals should be launched to identify and elaborate adequate means to close the competency and knowledge gaps that prevent clusters to address future trends in the Mediterranean and Black Sea.

An exchange programme for mobility of researchers could be valuable. For this the renamed Marie Skłodowska-Curie actions (MSCA) could provide a good platform. These programmes can also be used to strengthen the cooperation with non-EU countries, as the MSCA programme is open for participation to all countries of the region (ENPI/MEDA). The COSME scheme “clusters go international” is relevant as well. Furthermore, policy makers can stimulate that maritime clusters carry out a gap analysis on competences as well as available training / education facilities – as part of ‘horizon scanning’.

Action line 3: Engage clusters in Maritime Spatial Planning and Integrated Coastal Zone Management. The operation of maritime sectors is interlinked with competing economic activities as well as the maritime environment. The increasing use of Europe’s seas and oceans can lead to tensions and competition for maritime space, and put pressure on the marine environment. Maritime clusters need to be more engaged in Maritime Spatial Planning. Member States can make use of their knowledge about future space needs, which are required for the preparation of cross-sectoral maritime spatial plans by 2021. Maritime clusters are also natural partners to engage in all initiatives regarding Integrated Coastal Zone Management, but it is primarily up to local and regional governments to reach out to them.

Action line 4: Embrace maritime clusters as part of Smart Specialisation. Across the sea-basins, several representatives from maritime clusters expressed their disappointment about the fact that they had not actively been consulted in the preparation of new European Structural and Investment (ESI) programmes, and that maritime cluster activities had not been taken fully into account in the programming round 2014-2020. It is therefore important to build on Maritime clusters when rolling out Smart Specialisation Strategies. The EU and Member States should also strengthen the alignment of transport projects with the TEN-T, giving priority to projects on port access and hinterland connections. Policy makers should encourage ‘flexible’ Infrastructure investments, and planning of infrastructure should take into consideration the versatility of its use, and capitalise on it.

Action line 5: Promote marketing and visibility of maritime clusters. The cluster concept is still poorly known amongst many entrepreneurs, policy makers and even researchers in the Mediterranean and the Black Sea. Maritime Cluster Days could be held on the sub-sea basin / local level. Equally, it is important to establish the sustainable collection of meaningful data, for example through EMODNet as well as the Cluster Observatory.

Action line 6: Stimulate trans-boundary cooperation. Trans-boundary cooperation is a crucial part of building and managing clusters, and is not as just something 'extra'. It is important to take into account functional and existing relations including value chains within international territories, for example when developing sea-basin strategies. Policy support can be provided to ensure internationalisation is part of cluster business plans. Competency, skills and research are prominent areas for international collaboration that should not be overlooked.

Action line 7: Enhance good maritime cluster management (enabler). Benefits from clusters depend strongly on the ability of cluster managers to focus on the right things, and to do them right. Policy makers can promote good cluster management by bringing existing initiatives to the attention of cluster managers, including the European Maritime Cluster Network, the Cluster Observatory, the European Cluster Collaboration Platform, the European Cluster Excellence Initiative (ECEI) and the European Territorial Cooperation programmes.

Despite the above opportunities, managers of maritime clusters seem to have not yet gained the adequate level of networking and knowledge capacity needed to fully access them. Therefore, the **launch of a dedicated and open network for maritime clusters** would help to boost the capacity to manage maritime clusters. It would strengthen above all emerging clusters that lack critical mass and capacity. And this would allow maritime clusters to play a more important role in bringing innovation and diversification of the maritime sector. Although the network would be open to all maritime clusters in the EU and its surroundings, it would have a focus on the Mediterranean and Black Sea sea-basins, and would contribute to the "Mediterranean Reborn" mission. The network could be set up by EC DG MARE as a stand-alone, or be linked to any of the above initiatives.

1 Introduction

1.1 Why do clusters remain so important?

The cluster concept can be regarded as one of the most powerful policy instruments to address current economic development and competitiveness challenges, in Europe as well as globally. Clusters make concentrations of economic activities visible, even though it can be difficult to grasp or measure their importance in full.

Clusters are important to economic development and competitiveness. First, they can underpin an increase in productivity and operational efficiency. Clusters facilitate efficient access to specialised inputs, services, employees, information, institutions, training programmes and other public goods, and they ensure ease of coordination and transactions across firms. They also aid a rapid diffusion of best practices, and help firms to make on-going and visible performance comparisons. Such comparisons provide incentives to improve performance vis-à-vis local rivals. The proximity of rivals, in turn, encourages strategic differentiation. Clusters also stimulate and enable innovations, and the density of clusters enables recognition of innovation opportunities. The presence of multiple suppliers and institutions in clusters assists in knowledge creation. Similarly, proximity of players ensures an ease of experimentation given locally available resources. Clusters also facilitate commercialisation and new business formation. They offer opportunities for new companies and new lines of established businesses that become apparent much faster than in more fragmented environments. Spin-offs and start-ups are encouraged by the presence of other companies, commercial relationships, and concentrated demand. Commercialising new products and starting new companies is easier because of available skills, suppliers.

1.2 Maritime clusters at the core of Blue Growth

Within the context of this study, we build on the definition of clusters by M. Porter² and define maritime clusters as “a geographically proximate group of interconnected companies and associated institutions in the maritime field, linked by commonalities and complementarities (external economies)³”. More specifically, we interpret this interconnection between stakeholders according to the “triple helix” approach, where academia, industry and government operate in a coordinated way in order to accelerate value creation in certain economic activities.

Clusters fit well into the Blue Growth philosophy and its implementation. The Blue Growth strategy⁴ is designed to provide policy makers at EU and sea-basin levels, with a comprehensive, robust and consistent analysis of possible future policy options to support smart, sustainable and inclusive growth from the oceans, seas and coasts. However, achieving the true potential which Blue Growth can offer for Europe requires specific policy actions to foster innovation and stimulate concrete growth paths. In particular, in order to make Blue Growth really happen there is a need to capitalise on existing initiatives on the ground and make use of synergies. This is what clusters are all about.

² Professor Michael E. Porter, 20120213, MOC2012 (HBS course), Session 5 – final.

³ Maritime clusters at national level are therefore not the focus of this study.

⁴ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Blue Growth opportunities for marine and maritime sustainable growth, COM(2012) 494 final, 13.9.2012.*

Blue Growth potential is strongly influenced by the performance of established and emerging maritime clusters active in a variety of maritime sectors throughout Europe. Clusters are therefore deemed important for Blue Growth especially since the development of maritime economic sectors (notably those in a pre-development or growth stage) is dependent on establishing the appropriate interlinkages amongst local players and reinforcing growth potential. Still, it has become clear that to prosper and flourish, maritime clusters require stronger local and regional involvement⁵, as well as greater support and recognition at the EU level⁶.

Maritime clusters already emerged as an important topic in the DG MARE Blue Growth study “*Scenarios and drivers for sustainable growth from the oceans, seas and coasts*”⁷. The study acknowledged the relevance of maritime clusters as entities through which Blue Growth can be best reinforced, by taking advantage of maritime synergies. However, the study recognised that taking advantage of existing opportunities requires that the specifics of each location, area or coastal region, are reflected upon and adequately addressed.

1.3 Maritime clusters in the Mediterranean and Black Sea regions

European maritime industries are world leaders in terms of market share, innovative capacity, and global technologies. However, such industries are also highly fragmented, not only geographically but also in terms of sector coverage and company size. Past efforts to integrate the European network of maritime industries, sectors, and entrepreneurs to increase global market share have only been partially successful.

Blue Growth provides enormous potential for smart, sustainable and inclusive economic and employment growth. Nevertheless, each of Europe's sea-basins has its own economic, social, environmental, geographic, climatic and institutional characteristics that will contribute to a differentiated Blue Growth path. In the context of this study, we will focus on the distinctive elements that characterise the Mediterranean and Black Sea areas, taking into due consideration the coastlines of EU Member states and non EU countries. This includes a sub-region geographical approach, allowing us to better grasp the specific elements of the Western Mediterranean, Adriatic-Ionian, Central Mediterranean, Eastern Mediterranean, as well as the Black Sea area⁸.

There is a clear added value for the European Union to understand the synergies that potential intra- and inter- maritime cluster cooperation, coordination and internationalisation in the Mediterranean and Black Sea regions could bring. With competitiveness levels of many, especially Southern EU countries having been challenged by the economic crisis, the timing for a new, less fragmented, maritime cluster strategy is greater than ever. At the same time, since maritime clusters of the Mediterranean and Black Sea regions are at different levels of maturity, they require a differentiated approach of (cluster) development.

According to the European Cluster Observatory, the scale of the maritime activities in broader cluster activities lies typically below 3% of total GDP. These numbers, however, do not include tourism related activities, such as cruise tourism, that form part of the maritime clusters in the Mediterranean and Black sea region. Similarly, logistics and transportation is an important sub-sector that is not included in the above ECO maritime cluster definition. Hence, there is lack of a clear picture of the state-of-play and potential of maritime clusters in the Mediterranean and the

⁵ Blue Growth: *Scenarios and drivers for sustainable growth from the oceans, seas and coasts*, Ecorys Final report.

⁶ http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/ESaTDOR/FR_160413/ESaTDOR_Executive_Summary.pdf.

⁷ Ecorys (2012) “*Scenarios and drivers for sustainable growth from the oceans, seas and coasts*”. EC DG MARE.

⁸ A breakdown of countries by sea-basin is provided in section 2.1.

Black Sea. This prevents actors to address challenges, support innovative projects and initiatives, strengthen existing dynamics and design the appropriate path for new ones to grow.

1.4 About this project

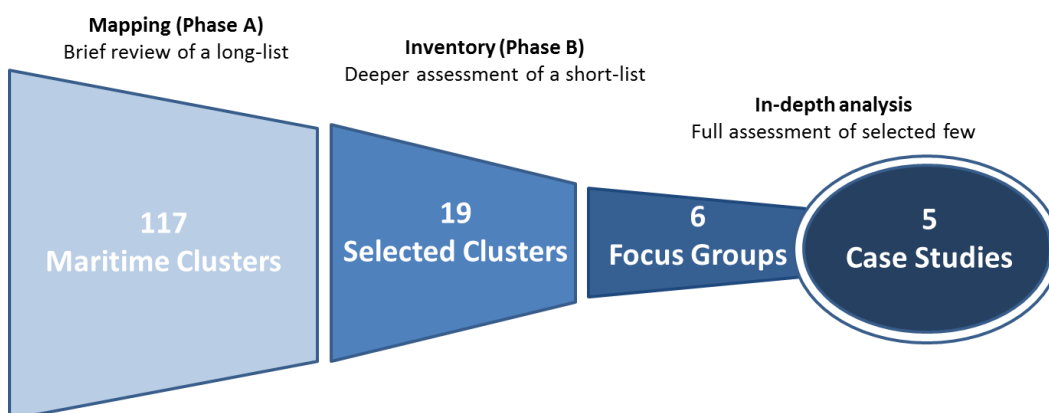
This project aims to provide policy makers at the EU and sea-basin levels an updated analysis of the current status and potential development of maritime clusters in the Mediterranean and Black Sea areas. In order to realise this aim, the study:

- Provides insights into the state of the art of existing clusters in the field of the maritime economy, in the Black Sea and in each of the four Mediterranean sea-basins, and identifies their specialisation, functioning and overall performance. This helps to identify the most important maritime economic activities in each sea-basin, from a clustering perspective;
- Brings together local stakeholders to discuss issues at the cluster but also at the sector level;
- Develops a good understanding of the strengths and weaknesses, from a clustering perspective, of the most important maritime economic activities in the Mediterranean and the Black Sea areas;
- Identifies possible existing international cluster cooperation in the maritime sector between EU and non-EU countries;
- Assesses the possible implementation of maritime clusters concepts in each region and for the relevant sectors; and
- Develops a ground for future activities and policy initiatives that can best trigger innovation and promote sustainable growth at a cluster as well as at a sea-basin level.

1.5 About our approach

The study consists of seven consecutive tasks. It starts with the establishment of a list of existing clusters in the field of the maritime economy, in both the Mediterranean and the Black Sea, including clusters in both EU and non-EU countries (Tasks 1 and 2). This overview has been provided in two stages: a broad inventory of 117 clusters (Phase A) and a more in-depth inventory and analysis of 19 selected clusters (Phase B)⁹. The details of these clusters are presented in Annex II.

Figure 1.1 Overview of the research steps in the inventory stage: 117 Maritime Clusters, 19 Selected Clusters, 6 Local Focus Groups



The above analysis has resulted in the shortlisting of 6 maritime clusters (Fig 1.1). When selecting these clusters, the following criteria have been applied:

⁹ The DITENAVE cluster has been added to the Phase B inventory.

- Geographically balanced, not because of equity reasons but because sub-region specificities must be addressed for a sound analysis of Mediterranean and Black Sea potentials;
- Include not only “single nodes” but also “multiple nodes”;
- Cross-border cooperation, so as to examine how to benefit from it at sub-region level;
- Broad sectoral diversity. Going beyond “traditional” clustering in ports/harbours and shipping activities, towards other sectors of the value chains of the Blue Economy, such as coastal and cruise tourism, coastal protection, and blue biotechnology; and
- Challenges. The focus group destinations need to be able to generate interesting challenges that are of use to multiple clusters.

The objective of these focus groups was twofold: a) validating the current findings of the study; and, b) acquiring concrete knowledge regarding the challenges and potentials of the specific cluster from the point of view of the relevant local stakeholders. The six local focus groups have been complemented by a Brussels-based focus group on governance (Task 3).

Subsequently, the project has taken forward five case studies, based on the focus groups, and centred around carefully chosen topics that are at the heart of maritime cluster governance, and which are of use to a broader set of cluster actors, including policy makers at all levels (Task 4).

This resulted in an analysis of cross-cutting findings and conclusions (Task 5).

The findings from Tasks 1-5 prepared the ground for the realisation of a two-day workshop with stakeholders in order to share and learn lessons (Task 6). These insights have been used to finalise the recommendations in this Final Report.

1.6 Structure of the Final Report

The remainder of this Final Report is structured as follows.

Chapter 2 provides an overview of the maritime cluster patterns in the Mediterranean and Black Sea regions, based on both mapping and inventory. It pays attention to sectoral characteristics, critical mass, differences of maturity and trans-boundary cooperation.

Chapter 3 provides an in-depth overview of the field investigations, consisting of the findings from the local focus groups combined with the key elements of the subsequent case studies.

Chapter 4 focuses on the question how to exploit the benefits of clusters. It provides an assessment of the cross-cutting findings and is drafted above all for maritime cluster managers. It restates the rationale of maritime clusters specifically in the Mediterranean and Black Sea regions, sets out the benefits of maritime clusters, and the prerequisites for maritime cluster development in the region.

Chapter 5 provides a Roadmap for policy makers. It identifies when to support maritime clusters and when not. It then presents seven Action lines for policy makers at all levels.

2 Patterns in the Mediterranean and Black Sea

2.1 Mapping of existing clusters

For the initial selection of a set of maritime clusters (Phase A), the following criteria were established:

- Critical mass. Clusters need to have a minimum size, in order to be considered concentrations of activities. However, maritime clusters can be located in peripheral and/or sparsely populated regions, and may therefore be smaller than clusters in more highly urbanised regions;
- Number of maritime economic activities. Clusters take advantage of synergies related to proximity of adjacent activities. Within the context of Blue Growth, particular emphasis is put on maritime economic activities, hence we focus on those clusters which are multi-sectoral;
- Existence of research, training and other supporting infrastructures (i.e. maritime institutes), that can strengthen the above synergies and the functioning of the cluster; and
- Potential for future development. Certain maritime economic activities are mature or even declining, whilst others are growing or embryonic. Synergies can exist between them.

Existing mapping and documentary sources provided a useful basis on which to build and refine the selection of maritime clusters against the four criteria. The inventory of the European Clusters Observatory was taken as a starting point (Fig. 2.1), and further tailored, in order to include a wider spectrum of maritime economic activities and actors¹⁰, and to adjust the analysis to the rationale of this study.

Figure 2.1 Maritime clusters in Europe, as identified by the European Clusters Observatory



Source: European Clusters Observatory

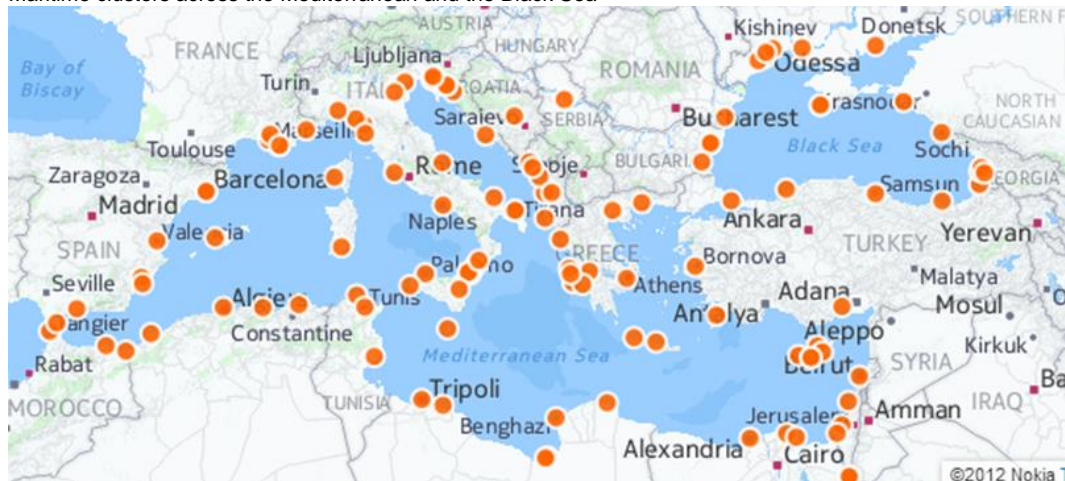
As a first step 117 maritime clusters were identified, mapped and explored with the aim to identify cluster characteristics, such as the life cycle, the potential for future development, the existence of trans-boundary cooperation with other countries, as well as the main features in terms of cluster base (place- or policy-based). Specific insights could be derived from the breakdown by geographic units, corresponding to Black Sea, East Mediterranean, Adriatic-Ionian, Central Mediterranean, and West Mediterranean.

¹⁰ The Observatory's definition of Maritime includes the following NACE 2.0 industries: 01.70 - Hunting, trapping and related service activities; 03.11 - Marine fishing; 03.12 - Freshwater fishing; 03.21 - Marine aquaculture; 03.22 - Freshwater aquaculture; 10.20 - Processing and preserving of fish, crustaceans and molluscs; 13.94 - Manufacture of cordage, rope, twine and netting; 25.29 - Manufacture of other tanks, reservoirs and containers of metal; 30.12 - Building of pleasure and sporting boats; 47.23 - Retail sale of fish, crustaceans and molluscs in specialised stores.

Within this study, the **Western Mediterranean** sea basin includes the Mediterranean coastlines belonging to Spain, France, Italy¹¹, Morocco and Algeria. The **Central Mediterranean** comprises the Italian region of Sicily, Malta, Tunisia and Libya. The **Adriatic-Ionian** sea region is bounded by Italy, Slovenia, Croatia, Bosnia-Herzegovina, Montenegro, Albania and Greece. The **Eastern Mediterranean** sub-regional basin includes Greece and Cyprus as well as the Mediterranean coast of Turkey, Lebanon, Israel, Palestine, Egypt and Jordan¹². The **Black Sea** coastline is shared by six countries: Bulgaria, Romania, Ukraine, Russia, Georgia and Turkey.

The inventory pointed to a wide variety of maritime actors and activities. An overview of the localisation of the 117 clusters is represented in Figure 2.2 and their main characteristics and classifications are detailed in Annex I¹³.

Figure 2.2 Maritime clusters across the Mediterranean and the Black Sea



Source: Specifically elaborated for this study

This inventory was fundamental not only to gain clear insights on existing patterns, but also to identify and validate which of those categories better inform on the behaviours, features, evolution, issues and good practices of maritime clusters. This section summarises the most relevant insights and conclusions from Phase A in relation of a number of factors, such as the cluster life cycle, the potential for future development, the existence of trans-boundary cooperation, the cluster base, as well as the existing maritime economic activities.

2.2 Positioning of clusters within the life cycle

Time plays an important role and influences the patterns of maritime clusters. The needs and features of a cluster evolve through time and, consequently, policies to support maritime clusters have to take into account their development phase in order to suit the requirements of the specific stage of cluster growth. Table 2.1 identifies across the clusters the different stages in the life cycle, distinguishing between mature, growing, emerging and stable/declining clusters¹⁴.

¹¹ For consistency matters, the Italian region of Sicily will be dealt with under the Central Mediterranean sea basin.

¹² Despite not having access to the Mediterranean sea, it is considered relevant to include Jordan because of its partnership and cooperation with the EU and other Middle East countries under the European Neighbourhood Policy.

¹³ All figures and tables included in this section are built on the collected information for the 117 clusters.

¹⁴ In function of the cluster life cycle, we identify four main categories: mature (long-established clusters, often dealing with rather traditional activities), growing (more recently established clusters which are in an expansion phase), emerging (newest, embryonic clusters) and stable-declining clusters (those presenting a scarce potential for future development and a stable or decreasing performance over the last years).

Table 2.1 Cluster life cycle by sub-sea region

A. Overall number of clusters mapped

	Total	Black Sea	East Med	Adriatic	Central	West
Emerging	17%	9%	11%	32%	7%	19%
Growing	48%	87%	11%	25%	67%	53%
Mature	29%	4%	74%	25%	27%	25%
Stable/ Declining	6%	0%	5%	18%	0%	3%
Total (abs)	117	23	19	28	15	32

B. Of which EU

	Total	Black Sea	East Med	Adriatic	Central	West
Emerging	23%	35%	25%	24%	17%	21%
Growing	34%	67%	0%	29%	33%	42%
Mature	37%	0%	76%	33%	50%	33%
Stable/ Declining	6%	0%	0%	14%	0%	4%
Total (abs)	65	6	8	21	6	24

C. Of which non-EU

	Total	Black Sea	East Med	Adriatic	Central	West
Emerging	10%	0%	0%	57%	0%	13%
Growing	65%	94%	18%	14%	89%	88%
Mature	19%	6%	73%	0%	11%	0%
Stable/ Declining	6%	0%	9%	29%	0%	0%
Total (abs)	52	17	11	7	9	8

Overall, almost half of the clusters mapped (48%) can be considered growing, while 29% are mature and 17% emerging. The number of clusters belonging to the stable/declining category is limited as a consequence of the selection criteria used (notably future potential). Differences in terms of cluster maturity are clearly visible between sub-sea-basins. The East Med region shows a strong concentration of mature clusters (74%, including the Greek and Turkish ports), while the Black Sea region (87%)¹⁵, Central Med (67%), and also the West Med (53%), are characterised mainly by growing clusters. On the other hand, the Adriatic-Ionian region shows a high presence of emerging clusters (32%, against a total average of 17%), mainly attributable to Montenegro, Italy and Albania.

While EU clusters mapped present a more balanced ratio between mature, growing and emerging clusters, the picture for non-EU clusters is very different. **Of the mapped non-EU clusters, two out of three have been classified as growing.** The number of growing clusters is high in the Central and West Mediterranean as well as Black Sea basins, and less so in the East Med, but also in the Adriatic which represents a higher number of emerging clusters. Although only indicative, this finding can point to the fact that maritime growth in the Mediterranean and Black Sea region can very well come from the non-EU side – perhaps more so than from the EU itself.

¹⁵ This inventory was carried out before the crisis in Eastern Ukraine started; it is too early to state whether these prospects will need to be adjusted in light of the evolving geopolitical situation in the region.

The **prospect for future development** has been an important selection criterion for maritime clusters. 92% show average or high potentials of future development¹⁶ in terms of innovativeness, potential for competitiveness of industries, future employment creation, relevance of policy initiatives, spill-over effects and synergies with other economic activities, and sustainability and environmental aspects.

Although this seems to happen independently from the cluster maturity status, there is some variety between sea-basins. The Black Sea and West Med regions show particularly high levels of potential for future development. These areas are also among the sub-regions presenting an important presence of growing clusters (Table 2.2).

Table 2.2 Development potential by Sub-sea region

Development potential	Total	Black Sea	East Med	Adriatic	Central Med	West Med
High	52%	70%	53%	39%	33%	59%
Average	40%	26%	42%	50%	67%	28%
Poor	8%	4%	5%	11%	0%	13%

2.3 Sectoral characteristics

A strong concentration around similar and rather traditional activities can be observed across the mapped clusters. The most relevant activities in almost all the clusters mapped are: short-sea shipping; coastal tourism; cruise tourism; shipbuilding and ship repair; deep-sea shipping; passenger ferry services; and, catching fish for human consumption. This pattern appears to be typical for the Mediterranean and Black Sea regions, as other sea-basins tend to display a more varied and diverse picture¹⁷. Hence, this limited variety and the focus on traditional maritime economic activities could be regarded as a possible sign of limited innovation in the Mediterranean and Black Sea regions.

Indeed, **more innovative maritime sectors are underrepresented** in the mapped clusters (Table 2.3). From the five areas with a high potential for job creation and the application of innovations that were identified by the Commission's Blue Growth initiative (blue energy, aquaculture, maritime and coastal tourism, marine mineral extraction, and blue biotechnology), maritime and coastal tourism and aquaculture are most visible in these sea-basins. An exception can be observed in the case of the emerging clusters, which still tend to concentrate on the most common identified activities, but in a proportionally lower intensity when compared to other clusters. **Emerging clusters carry out more innovative activities** related to; the protection against flooding and erosion; offshore wind; the traceability and security of goods supply chains; the prevention and protection against illegal movement of people and goods; and, Blue biotechnology. This means that **the highest diversification of maritime economic activities is mainly boosted by emerging clusters**.

¹⁶ We need to recognise the self-selection bias here, as 'potential for development' has been used as one of four criteria to select clusters.

¹⁷ See *Blue Growth, Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts*, chapters 4 and 5 http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/blue_growth_third_interim_report_en.pdf

Table 2.3 Maritime economic activities by Cluster life cycle

Maritime economic activities	Cluster life cycle				
	Total (117)	Mature (34)	Growing (56)	Emerging (20)	Stable/Declining (7)
Short-sea shipping (incl. Ro-Ro)	59%	56%	73%	30%	43%
Coastal tourism	43%	74%	34%	30%	0%
Cruise tourism	39%	59%	43%	10%	0%
Shipbuilding (incl. leisure boats) and ship repair	38%	24%	48%	30%	43%
Deep-sea shipping	37%	44%	38%	20%	43%
Passenger ferry services	34%	50%	36%	10%	14%
Catching fish for human consumption	32%	47%	23%	30%	29%
Yachting and marinas	22%	18%	27%	20%	14%
Marine aquatic products	17%	24%	13%	25%	0%
Offshore oil and gas	17%	21%	20%	10%	0%
Environmental monitoring	6%	0%	7%	10%	14%
Inland waterway transport	5%	0%	11%	0%	0%
Protection vs. flooding and erosion, salt water intrusion, protection of habitats	3%	3%	2%	10%	0%
Construction of water projects	3%	3%	2%	5%	0%
Catching fish for animal feeding	3%	0%	5%	0%	0%
Traceability and security of goods supply chains, prevention and protection against illegal movement of people and goods	3%	0%	2%	10%	0%
Offshore wind	2%	0%	0%	10%	0%
Blue biotechnology	2%	0%	0%	10%	0%
Securing fresh water supply (desalination)	2%	0%	4%	0%	0%
Ocean renewable energy	1%	3%	0%	0%	0%
Carbon capture and storage	0%	0%	0%	0%	0%
Aggregates mining (sand, gravel, etc.)	0%	0%	0%	0%	0%
Marine minerals mining	0%	0%	0%	0%	0%

Note: A short description of each MEA is included in Annex III

The five sub-regions follow a broadly similar pattern, with some variety:

- In the **Black Sea** area, the shipbuilding and the oil and gas sectors are particularly relevant, and this is the only region where inland water transportation appears among the main Maritime Economic Activities;
- Tourism, either coastal or cruise, is by far the most common activity of **East Med** clusters;
- The **Adriatic-Ionian** sub-region shows the highest heterogeneity, with a higher diversification of activities. Aquaculture scores above the overall average while cruise tourism is underrepresented in the clusters of the sub-region;
- In the **Central Med** sub-region, clusters score above the average in short-sea shipping, cruise tourism, deep-sea shipping and passenger ferries; and,
- In the **West Med** sub-region, a strong relevance of deep-sea shipping, shipbuilding and yachting can be observed.

2.4 Estimating size of maritime clusters in the region

Despite the above indications, there is only scarce information available about the size of maritime economic activities.

2.4.1 The notion of critical mass

In cluster theory, size is important and often related to critical mass, which is a concept referring to the mass which is needed to ensure a basis for more and intensive cooperation, exploit the development potential and defend its market position in a sustainable way. According to Brenner and Fornahl¹⁸, “critical mass is determined by the number of firms, the number of employees and other local conditions such as regional human capital, the presence of supporting services, and public research institutions”. In this context, the number and typologies of actors operating in a common field will be relevant for its development and success, as they will provide the cluster and eventually its region with the ability “to attract specialised services, resources, and suppliers, as well as a well-qualified labour force”¹⁹. Once it has reached the sufficient critical mass, the cluster is supposed to follow growth based on a self-augmenting process²⁰.

This theory highlights a number of relevant factors with respect to the critical mass of clusters: the number and typologies of members of the clusters, and their size; the employment created by the economic actors; and, the evolution path of the cluster, which is identified as a process tending towards sustainability. In a policy perspective this can be related to the need for public action and support in the emerging and growing phase of the cluster, to accompany it towards an optimal point where it becomes self-sufficient and the leader of its own further development.

Cluster studies available suggest that “despite the difficulty of assessing critical mass, the majority of experts tend to agree that in most cases at least around 50 companies are necessary to reach critical mass” and that see “200 as a practical maximum number of firms to be part of a cluster before it loses efficiency due to being too large”²¹. Similarly, in its analysis on the “Demography of clusters”²², van der Linde identifies an average number of 150 companies per cluster, and 15,000 employees per cluster as the most common values.

Despite the high relevance of critical mass for cluster growth and evolution, the literature has not been able to identify some optimal standards of clusters size in terms of number and typologies of members, or the employment created. The search for an ideal size of clusters has not led to a ‘one-size-fits-all’ formula. Despite the high amount of empirical analyses on existing clusters, “no one has satisfactorily identified that level of activity that achieves significant economies of scale and synergy among members”²³. Nevertheless, common points can be identified in the evolution of cluster critical mass, which may vary in its characteristics according to the typology of sector or industry, as well as its geographical position.

¹⁸ Brenner, T.; Fornahl, D. (2002): *Politische Möglichkeiten und Maßnahmen zur Erzeugung lokaler branchenspezifischer Cluster*. Max-Planck-Institut zur Erforschung von Wirtschaftssystemen, Jena.

¹⁹ Generating Local Wealth, Opportunity, and Sustainability through Rural Clusters, Supported by the Ford Foundation, March 2009, Regional Technology Strategies <http://rtsinc.org/publications/documents/RuralClusters09.pdf>.

²⁰ Clusters and clustering policy: a guide for regional and local policy makers (2010 - Chapt. 3.2.5/3.2.7/3.3.1)

<http://cor.europa.eu/en/Archived/Documents/59e772fa-4526-45c1-b679-1da3bae37f72.pdf>.

²¹ Lysann Müller, Thomas Lämmer-Gamp, Gerd Meier zu Köcker, Thomas Alslev Christensen, *Clusters are individuals, updated report, vol. II*, 2012 <http://www.cluster-analysis.org/downloads/ClustersareIndividualsVolumellAnnex.pdf>.

²² C. Van der Linde, *The Demography of Clusters—Findings from the Cluster Meta-Study*, 2003 www.isc.hbs.edu/cp/van_der_Linde_Demography_of_Clusters1.pdf.

²³ Generating Local Wealth, Opportunity, and Sustainability through Rural Clusters, Supported by the Ford Foundation, March 2009, Regional Technology Strategies <http://rtsinc.org/publications/documents/RuralClusters09.pdf>.

2.4.2 Positioning cluster activities within broader Maritime economic activities

Maritime clusters operate within the broader set of Maritime Economic Activities (MEAs), and this section considers the broader patterns, examining whether maritime clusters are equally important for all maritime economic activities, or are more important for some than for others.

Table 2.4 Positioning of cluster activity within the broader Maritime economic activities (MEAs) per sea-basin (based on employment)

	Total in all regions	Total in clusters	In the region	In the clusters	In the region	In the clusters	In the region	In the clusters	In the region	In the clusters	In the region	In the clusters
MEAs/Sub sea basin	TOTAL		West		Central		Adriatic		East		Black Sea	
Short-sea shipping (incl. Ro-Ro)	7%	16%	9%	16%	7%	19%	7%	13%	10%	12%	3%	21%
Coastal tourism	47%	12%	46%	9%	39%	5%	48%	17%	44%	18%	54%	9%
Cruise tourism	3%	11%	4%	7%	6%	19%	5%	7%	2%	15%	1%	9%
Shipbuilding (incl. leisure boats) and ship repair	8%	10%	6%	13%	7%	7%	8%	11%	9%	2%	10%	15%
Deep-sea shipping	4%	10%	3%	14%	2%	14%	2%	6%	8%	12%	1%	2%
Passenger ferry services	4%	9%	5%	8%	8%	12%	5%	11%	4%	8%	0%	8%
Catching fish for human consumption	15%	9%	18%	8%	19%	7%	16%	13%	14%	13%	7%	4%
Yachting and marinas	2%	6%	4%	11%	2%	7%	2%	6%	2%	0%	0%	4%
Marine aquatic products	1%	5%	1%	2%	1%	4%	1%	9%	2%	8%	0%	2%
Offshore oil and gas	3%	5%	1%	3%	1%	2%	1%	0%	0%	10%	13%	8%
Environmental monitoring	0%	2%	0%	1%	0%	0%	0%	3%	0%	0%	0%	5%
Inland waterway transport	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	3%	7%
Protection against flooding and erosion	1%	1%	1%	2%	2%	0%	1%	1%	0%	0%	0%	0%
Construction of water projects	3%	1%	1%	1%	1%	0%	2%	1%	4%	0%	5%	1%
Catching fish for animal feeding	0%	1%	0%	2%	0%	2%	0%	0%	0%	0%	0%	0%
Traceability and security	1%	1%	1%	2%	3%	0%	2%	1%	1%	0%	1%	0%
Offshore wind	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Blue biotechnology	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%

MEAs/Sub sea basin	Total in all regions		In the region		In the clusters		In the region		In the clusters		In the region		In the clusters	
	TOTAL		West		Central		Adriatic		East		Black Sea			
Securing fresh water supply (desalination)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%	
Ocean renewable energy	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Carbon capture and storage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Aggregates mining (sand, gravel, etc.)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Marine minerals mining	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

Source: Based on several secondary sources (see Annex). Data for clusters are weighted in terms of relevance over 100% since each cluster performs more than one activity. Data for regions are calculated on the basis of the estimations on the employment generated in the MEAs, on the basis of the fiches of the Blue Growth studies.

Table 2.4 provides an overview of the relative weight of each maritime economic activity in the sea-basin as a whole, compared to that of the maritime clusters studied²⁴. Coastal tourism is by far the most important maritime job creator, approaching 50% in the various parts of the Mediterranean and even exceeding this in the Black Sea. Catching fish for human consumption (based on a broad definition including fish processing) is another important activity, representing 1/5th to 1/7th of the jobs in Mediterranean (and much less so in the Black Sea). However, these activities are remarkably underrepresented in the maritime clusters studied, with coastal tourism making up 12% and catching fish representing 9% of all jobs in the clusters studied. Coastal tourism and to some extent catching fish are rather scattered activities.

As already noted, the **maritime clusters studied have a very strong focus on maritime transport**. They are often based around traditional ports: short-sea shipping (16% of all cluster jobs), cruise tourism (11%), deep-sea shipping (10%), shipbuilding (10%) and passenger service ferries (9% of all cluster jobs) are the most important. Added to this can be yachting and marinas (6%) , especially so in the West and to some extent the Central and Eastern Mediterranean. Marine aquatic products are a substantial activity in the Adriatic/Ionian and the Eastern Mediterranean, and also have the tendency to cluster. Other maritime economic activities have a minimal contribution to job formation to date, with the exception of construction of water projects – but only in the Eastern Mediterranean (clustered) and Black Sea regions (not clustered).

On the basis of the available figures on employment and number of companies in each MEA it has been possible to identify the **average size of the companies**. Table 2.5 shows that the average number of employees per company across maritime economic activities (weighted) is 23. However, the average number of employees is 36 when corrected for their presence in clusters. This difference is due mostly to the small size of tourism and fishing companies – both underrepresented in the clusters studied. Other maritime economic activities (e.g. offshore oil and gas) are much more capital intensive.

²⁴ Phase B inventory of the clusters has been used for this analysis.

Table 2.5 Average size of companies (number of employees) in the Mediterranean and Black Sea regions

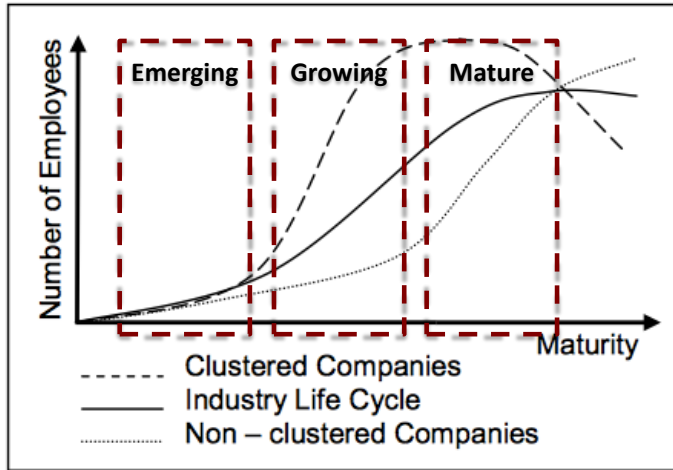
MEAs	Average Nr employees (when available)
Short-sea shipping (incl. Ro-Ro)	57
Coastal tourism	11
Cruise tourism	45
Shipbuilding (incl. leisure boats) and ship repair	26
Deep-sea shipping	32
Passenger ferry services	10
Catching fish for human consumption	7
Yachting and marinas	12
Marine aquatic products	12
Offshore oil and gas	219
Environmental monitoring	58
Inland waterway transport	8
Protection against flooding and erosion...	26
Traceability and security of goods supply chains...	39
Construction of water projects	26
Catching fish for animal feeding	28
Blue biotechnology	n/a
Securing fresh water supply (desalination)	24
Offshore wind	n/a
Ocean renewable energy	n/a
Carbon capture and storage	n/a
Aggregates mining (sand, gravel, etc.)	27
Marine minerals mining	n/a
Average (unweighted)	37
Weighted average according to MEAs relevance in the regions	23
Weighted average according to MEAs relevance in the clusters	36

Source: Based on several secondary sources

2.4.3 Towards estimating maritime cluster size

Despite the lack of a “one-size-fits-all” answer on the size of clusters, a relationship can be observed between the cluster life cycle and the cluster size which tends to increase over time (Fig 2.4).

Figure 2.4 Critical mass evolution over the cluster life cycle²⁵



Source: Max Plank Institute of Economics (2007)²⁶

In the emerging phase of the cluster, critical mass tends to be limited since it is still attracting potential members. It is after the cluster's emergence when "there is a sufficient number of companies to reach a critical mass and cluster dynamics start to show an effect"²⁷. In fact the growth, which is limited at an initial state, follows more rapid trends once the cluster enters the growing phase. It is already at the end of this stage of the life cycle when clusters seem to achieve their optimal size, end enter the mature phase. Nevertheless, an inversion of tendency can occur at some stage, and this corresponds to those moments when the cluster abandons the maturity phase to enter a declining one, since "the cluster dynamics stop working or have a negative effect on the companies in the cluster". Nevertheless, the evolution of clusters and their critical mass after the mature phase does not necessarily bring the towards decline, since the application of new technologies and knowledge allows them to "move back to an earlier phase of the cluster life cycle" and thus can enter new growth phases.

It is therefore possible to provide some **general estimates of the 'critical mass' of maritime clusters** by their degree of maturity, although each cluster has clearly a 'life of its own'. However we will need to do so on the basis of a number of assumptions.

Notably, and in line with existing literature on the behaviour of non-maritime clusters, the number of involved enterprises seems to constantly increase throughout the lifecycle. The main patterns and critical mass through the life cycle are:

- **'Emerging' maritime clusters** may have a limited number of enterprises, which from our assessment is within a range of few units at an early stage up to about 150 in a more advanced stage. A number of 50-60 members appears to be a minimum in order to recruit a cluster manager and basic support staff, as appears from the interviews held across selected maritime clusters and to allow for minimal amount of funding required²⁸. However we know maritime clusters face more challenges when reaching critical mass, and also know that a range of emerging clusters have not reached this ceiling yet. We therefore take an estimate of 30 companies here;
- **'Growing' maritime clusters** increase their size, often by including additional medium-large enterprises who join in when cluster economic potentials starts to become more appealing. The

²⁵ Ecorys elaboration on the basis of: Menzel, Max-Peter; Fornahl, Dirk, *Cluster life cycles: dimensions and rationales of cluster development*, Jena economic research papers, No. 2007,076 <http://www.econstor.eu/bitstream/10419/25650/1/553691740.PDF>.

²⁶ Cluster life cycles: dimensions and rationales of cluster development (p. 10)

www.econstor.eu/bitstream/10419/25650/1/553691740.PDF.

²⁷ Menzel, Max-Peter; Fornahl, Dirk, *ibid.*

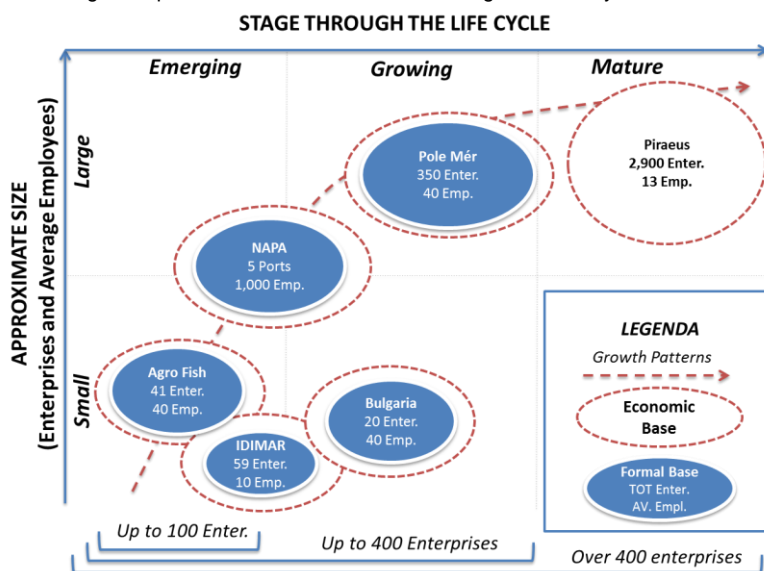
²⁸ Some of the maritime clusters analysed through Focus Groups and Case Studies still fail to achieve such critical mass (i.e. AgroBio Fishing, Bulgaria Maritime Cluster).

maritime clusters assessed vary largely, but reach up to 400 enterprises. For the above reasons, we take a conservative estimate of 100 companies;

- **'Mature' maritime clusters** can have an exponential growth, by developing innovation, which is capitalised by an ecosystem of small to micro enterprises, which provide added-value services for the cluster itself. Maritime clusters assessed tend to be very large and all "place-based", meaning territorial clusters aggregating a variety of local actors across one or more Maritime Economic Activities across a specific region or a port-city, tend to gather around 600 to 1,000 enterprise and reaching peaks of 2,000 to 3,000, but these numbers are not necessarily typical. For the above reasons, we take a conservative estimate of 300 companies per clusters; and
- **'Stagnant or declining' clusters.** We estimate these to have 200 companies on average.

These patterns are shown in Figure 2.6, which is based on the overall analysis of the maritime clusters mapped in the study (Phase B) and shows some specific examples by referring to those clusters assessed in greater details (i.e. through Focus Groups and Case Studies). It is important to acknowledge that these include the more visible and larger clusters in the sample, and that these are not necessarily representative numbers.

Figure 2.6 Size and growth potential of maritime clusters through their life cycle²⁹



Source: Estimations based on assessed maritime clusters (secondary sources / interviews)

Taking the average number of estimated companies per cluster, we can multiply these by the total number of clusters and the estimated average number of employees per company (an estimated 36 as demonstrated in Table 2.5 above, and shown below in Table 2.6).

²⁹ Employment given for each maritime cluster is to be understood as average number of employees per company.

Table 2.6 Employment estimates for maritime clusters in the Mediterranean and Black Sea (based on 117 clusters mapped)

A. Average number of estimated companies per cluster

	Total	Black Sea	East Med	Adriatic	Central	West
Emerging	30	30	30	30	30	30
Grow ing	100	100	100	100	100	100
Mature	300	300	300	300	300	300
Stable/ Declining	200	200	200	200	200	200
Average (w eighted)	152	102	246	146	149	140

B. Total estimated number of companies in maritime clusters mapped per sea-basin

	Total	Black Sea	East Med	Adriatic	Central	West
Emerging	597	62	60	269	30	182
Grow ing	5,616	2,001	200	700	999	1,696
Mature	10,179	276	4,218	2,100	1,202	2,400
Stable/ Declining	1,404	0	190	1,008	0	192
Total	17,796	2,339	4,667	4,077	2,231	4,470

C. Total estimated number of employees in maritime clusters mapped per sea-basin

	Total	Black Sea	East Med	Adriatic	Central	West
Emerging	21,481	2,236	2,155	9,677	1,085	6,566
Grow ing	202,176	72,036	7,182	25,200	35,964	61,056
Mature	366,444	9,936	151,848	75,600	43,254	86,400
Stable/ Declining	50,544	0	6,840	36,288	0	6,912
Total	640,645	84,208	168,025	146,765	80,303	160,934

These estimations lead to an approximation regarding the total potential numbers of employees in maritime clusters per mapped sea-basin. Across the Mediterranean & Black Sea (in EU and non-EU together), the total number of potentially employed in maritime clusters is **roughly estimated to be between 600 and 700 thousand people**, of which the East Mediterranean, West Mediterranean and Adriatic sea-basins provide the bulk. As a comparison, a conservative estimate of the maritime employment in the Mediterranean and Black Sea region (EU only) amounts to 900,000.³⁰ Thus, depending on the weight between EU- and non -EU parts of the sea-basin, it can be assumed that about a third to half of all maritime economic activities in the sea-basin can be found in (potential) clusters.

The following observations now apply when interpreting this numbers:

- 1) Estimates depend strongly on the number of clusters mapped; this estimate is based on 117 clusters mapped, but more could be identified depending on the search criteria defined;
- 2) The overall number of companies per cluster is crucial, and the estimate for mature clusters is particularly important. We have based ourselves here on the minimum required critical mass, in the knowledge that many clusters are having difficulties to reach this, while others far exceed these;

³⁰ COGEA and partners (2013) "Support to development of sea-basin cooperation in the Mediterranean, the Adriatic Ionian and the Black Sea, under Framework Contract for support to the implementation of the integrated maritime policy of the EU", for EC DG MARE.

- 3) The overall number of employees per company has been derived from analysis from maritime economic activities within the EU-part of the sea-basin. This can create both upward and downward bias when extrapolating to non-EU; and,
- 4) The above numbers relate rather to the local economic base and not to the formal cluster organisation. The number of employees in formal cluster organisations (often not present) will be lower. For example the Piraeus cluster provides jobs to 37,000 people, but there is no formal cluster organisation.

The above numbers also point to the importance of clusters developing over time. If half of the growing clusters would reach mature status, the overall positive employment impact could be about 200,000.

2.5 Trans-boundary cooperation

The **existence of cooperation** across and beyond the clusters' boundaries is consistent with the concept of cluster development and inter-linkages among actors. Often this cooperation is driven by EU-level initiatives.

By trans-boundary cooperation we intend any kind of cooperation between a maritime cluster established in a certain country and one or more actors in other countries, which is intended to promote innovation and competitiveness, exchange information and know-how, transfer technology, develop joint strategies and networking activities, and diversify clients and stakeholders.

Depending on its geographic characteristics, this cooperation can correspond to different typologies:

- **Cross-border cooperation** exists between a cluster and other actors localised in border territories of neighbouring countries, operating in related sectors and showing a potential for the joint creation of (innovative) goods and services that can ensure synergies for the development of the respective territories³¹. An example is the NAPA cluster, that brings together stakeholders from neighbouring countries that operate in the same traditional sector, in order to create a stronger critical mass;
- **Transnational cooperation** is meant as the coordinated action between a cluster and stakeholders belonging to one or more countries in the same area/region (i.e. sub-sea-basin). Pôle Mer Méditerranée, for instance, cooperates with actors belonging to other countries of its sea-basin for commercial purposes and to enhance its competitiveness; and
- **International cooperation** refers to a broader geographical concept, where clusters position themselves in specific fields of strategic interest in the global market. This is the case for the AgroBioFishing cluster, which is fostering cooperation with Northern European countries to diversify research towards more innovative fields and processes. Other clusters may use international cooperation to diversify their stakeholders and economic activities and to attract foreign investors (i.e. IDIMAR, Marine Cluster Bulgaria, and Piraeus).

Cooperation is especially relevant in the case of ports, of which even the competing ones are engaged in some type of inter-port coordination in an effort to increase their efficiency. Also due to the important presence of ports in the mapped clusters, **the majority of them have developed some type of trans-boundary cooperation (63%)**.

At sea-basin level, Black Sea (all clusters except one in Russia) and East Mediterranean (all clusters except Rhodes, Palestine and Beirut) sub-regions are particularly active in cooperating across

³¹ <http://www.econstor.eu/bitstream/10419/70921/1/final%20text.pdf>.

boundaries, while the West Mediterranean and Adriatic-Ionian regions show a less intense trans-boundary cooperation (Table 2.7). This can be due to the higher presence of emerging clusters in these sub-regions, and to the clusters features at country level. In the West Mediterranean region, for instance, most French and Algerian clusters do not show trans-boundary cooperation, and the same happens in all mapped Albanian clusters and different Italian clusters in the Adriatic-Ionian region.

Table 2.7 Clusters characteristics per sub-sea-basin

Trans-boundary cooperation			Total	Black Sea	East Med	Adriatic-Ionian	Central Med	West Med
Clusters with trans-boundary cooperation			63%	96%	84%	50%	67%	38%

3 Insights from field investigations

3.1 Our approach towards the field work

The fieldwork has been based on focus groups followed by case study work. The objective of these focus groups was twofold: a) validation of the findings of the study so far; and, b) acquiring concrete knowledge regarding the challenges and potentials of the specific cluster from the point of view of the relevant (local) stakeholders.

The sample of the selected six local focus groups was made based on the following criteria:

- Geographically balanced to take account of sub-region specificities;
- At least one example of trans-boundary cooperation, so as to examine how to benefit from it at sub-region level;
- Broad sectoral diversity, expanding from traditional port and shipping activities towards other sectors of the Blue Growth economy, like tourism, coastal protection, blue-biotechnology; and
- Challenges generated must be interesting and transferable.

The final list agreed with DG MARE comprises Piraeus (Greece), Marine Cluster Bulgaria (Bulgaria), AgroBioFishing (Italy)³², NAPA (Slovenia), IDIMAR (Spain), and Pôle Mer Méditerranée (France). In addition a central focus group was held in Brussels on cluster governance.

The sessions were structured as follows:

- Testing study findings focusing mainly on the identified features;
- Future opportunities and challenges related to competitiveness, governance and management of the clusters, innovation, public/private cooperation etc.;
- Bringing about change referring to policy issues, key actors and supportive actions; and
- Additionally, the six local focus groups were planned to provide feedback and insights for the Governance focus group to further elaborate the findings.

The seven focus groups were held in a two month period, between January and March 2014. The subsequent case-study work focused on specific aspects highlighted in the focus group, and based on desk research as well as interviews.

The main findings of the field investigation are structured as follows:

- Main features of the cluster;
- Future developments and possible barriers; and
- Lessons for other clusters.

3.2 Marine Cluster Bulgaria: The need for a higher level strategy to boost growth

Main features of the cluster

Marine Cluster Bulgaria, one of the first cluster formations in Bulgaria was established in August 2007 in Varna. The rationale behind the cluster establishment was: a) to encourage the cooperation between the representatives from different branches of the maritime industry; and, b) to build strategic relations with the academic sector, the national and local authorities and the Non-governmental organisations

³²A focus group was held here, but no case study was produced. For the focus group results please consult Annex V.

sector active in Maritime Economic Activities in Bulgaria. Currently, the Marine Cluster Bulgaria has 20 members working in the area of ship design, shipbuilding, ship repair, ship supply, agency and logistic services, commodity control, ship's chandlers, classification societies, underwriters. The academic partners are represented by the Naval Academy "N. Y. Vaptsarov" and the Technical University of Varna. Finally, the Bulgarian Association of Ship Brokers and Agents (BASBA) and the Bulgarian Shipowner Association (BSA) represent trade associations.

The members of the cluster employed 2,882 people in 2012, representing 20% of the total workforce for the maritime industry in Bulgaria. The cluster as a whole has a turnover of over 312 million BGN (approx. €160 million) for 2011, which is a substantial part (35.7%) of the turnover in the maritime industry, amounting to about €448 million.

The following activities are undertaken across the cluster:

- Continuing the work of the high-tech educational centre for professional training in the fields of marine logistics and trading operations. This is situated in the Technical University of Varna. The core activity is the implementation of innovative learning method "supply chain simulator";
- Receiving the patent for the collective trademark which will provide stronger image of the companies within the cluster;
- Provision of legal support and consultations. The cluster supports its members in project development, establishing contacts with potential business partners. They have prepared market research on shipbuilding for an external company;
- Organising the "Days of Marine Cluster" each year in Bulgaria;
- Creating an intranet and database for searching and offering job vacancies in the marine industry;
- Evaluation of the strategic capacity of Maritime Industry in Bulgaria, gathering data about employment, turnover, market share, and growth rate of the sector; and
- Exchange of experiences and best practices with clusters, and members of the European Network of Marine Clusters (ENMC).

Future developments and possible barriers

The cluster has the ambition to grow and to enlarge as an organisation, increasing the number of members, the number of the employed staff, and the volume of the turnover. Unfortunately, the global financial crisis from 2008 had a very negative impact on all branches of the maritime sectors, especially for shipbuilding and ship repair. Since then, the mix of unstable economic situation, outdated legislation and lack of strategic vision for the development of the maritime sector was detrimental to any long term strategy for the Marine Cluster Bulgaria. Currently the management of the cluster is more pragmatically focused on the achievement of the mid-term goals of the organisation, which is in practice to support the current partners and trying to survive the current crisis.

The barriers hindering the cluster potential are external barriers which are outside the capacities of the cluster, and internal barriers which are the ones which could be overcome by the cluster:

- External problems which affect the full development of the cluster are: lack of statistics and analysis for the maritime sector in Bulgaria; centralized port management at the national government level which does not support specific local/regional strategies; lack of coordination among institutions responsible for the maritime industry and the cluster policy in Bulgaria; and a lack of cluster policy and cluster development strategy at the national and regional levels; and
- The internal factors are: needing a more capable promoter (driving force) for the Marine Cluster Bulgaria development; and, the need to increase the capacity of the cluster in influencing and lobbying key national organisations;

Nevertheless, the Marine Cluster Bulgaria is working on overcoming the obstacles mentioned above, and has undertaken action. A success factor so far is the creation of good working relations with the Ministry of Economy and Energy regarding the cluster policy development and future cluster support.

Also, the cluster is using all resources to promote both the economic potential of the maritime sector and the cluster idea in Bulgaria, through organising yearly “Days” (events) for the marine cluster, international conferences, and study visits to marine clusters in Europe.

The development of relations with maritime clusters from the neighbourhood countries in the Black Sea basin is another challenging task which hinders the Marine Cluster development. In fact, although two of the Black Sea countries - Bulgaria and Romania - are members of the EU, there is lack of initiative for common activities within the Black Sea region. This problem may be overcome once a common Black Sea Maritime Strategy³³ is in place and as the Romania Maritime Cluster³⁴ becomes more active in the future. EU funding and support programmes and their strategies and priorities differ from country to country. For example, Bulgaria and Romania receive financing from the Structural Funds, Turkey from the Instrument for Pre-accession Assistance (IPA) and Ukraine from the European Neighbourhood and Partnership Instrument (ENPI). All these difficulties hamper the creation of stable relations between the clusters and other possible partners across the Black Sea basin. Although the current instability of the region due to the Crimea crisis may prevent collaboration in the short-term, collaboration between Romania and Bulgaria could still be more efficiently supported by EU policy. Now, more than ever, it is relevant to further elaborate and agree a common strategy that can outline the future priorities in the development of the Black Sea region, and which will create grounds for cooperation activities.

Lessons for other clusters

- A clear lesson is the need for a robust policy framework at the national level. This has to be actively backed by a strong political vision and action plan from central institutions (national as well as sea-basin level), so to provide adequate resources and interventions aimed at renovating local infrastructures, providing support to local start-ups, and boosting the broad local maritime economy;
- A key practical lesson emerging from this case study is that, in the absence of broader policy initiatives, cluster organisations are essential for the local maritime economy. They can support the exchange of good practices, and the sharing of experience through dedicated forums, meetings and seminars at the national and international level;
- The role of a bottom-up cluster organisation such as the Bulgaria Maritime Cluster (one it was promoted by public and private maritime organisations in Varna) has proven essential to gather existing local maritime bodies and companies and trigger greater cooperation and shared resources. This has resulted in innovative training projects promoted by local private companies, as well as joint lobbying and visibility of the local maritime sector towards national and EU-level policy makers;
- A further lesson emerging from the Bulgarian case study is that of the essential role of EU policy and programmes in supporting bottom-up initiatives to gain international visibility amongst potential peer organisations, and to exchange practices with other similar bodies in the Black Sea and other EU sea-basins;
- Further efforts are needed for the elaboration and acceptance of the Black Sea strategy as an agreement ‘on paper’ to an actual enabling policy framework which could sustain and boost local bottom-up initiatives; and
- The programming and implementation of such a maritime strategy document in the Black Sea is rather complicated, because not all neighbouring countries are EU Member States. This makes the coordination of the priority actions and funding a challenging process.

³³ http://ec.europa.eu/maritimeaffairs/policy/sea_basins/black_sea/projects_en.htm.

³⁴ The Romania Maritime Cluster has been admittedly “relatively inactive” in the past years.

3.3 Pôle Mer Méditerranée: Exploring and exploiting maritime competencies

Main features of the cluster

The economy of the Var department is deeply embedded in the maritime sector, with the bay of Toulon as its focal point. Until 1966, the province of Toulon hosted three important shipyards situated in La Ciotat, La Seyne-sur-mer and in Port-de-Bouc. Over the years, the three shipyards launched around 1,050 large ships, but this came to an end in the period 1966-1989, when the three shipyards were forced to shut down consecutively. Despite the rapid decline of the shipbuilding sector, the territory has remained embedded with valuable competences, and the skills and know-how have shown their adaptability, improving their resilience in being able to reapply themselves to new areas of application.

The Pôle Mer Méditerranée was created in 2005 to provide a structured response to the changing economic circumstances. It is the result of a local initiative aiming at stimulating traditional territorial specialisations, and boosting traditional maritime economic activities, and is embedded within the concept of the French 'competitiveness poles'. Through innovation the cluster supports the re-qualification of mature skills, and the creation of added value along traditional maritime value chains.

Since its creation the Pôle Mer Méditerranée has been focusing on six maritime economic activities, combining both traditional and emerging economic activities:

- Ports, infrastructure and maritime transport;
- Maritime security and safety;
- Ships and nautical industry;
- Marine energy and mineral resources;
- Marine biological resources; and
- Environment and coastal management.

The Pôle Mer Méditerranée develops and implements actions in partnership with other local clusters and with international partners. To meet its international ambitions, since 2006 the Pôle has implemented a strategy of openness towards foreign countries, the first ones being the countries in the Mediterranean basin.

Future developments and possible barriers

The development of a sustainable maritime economy will be the Pôle's strategic objective for 2013-2018³⁵ and will be implemented through the three following strategic axes:

- Become one of the main levers to the Integrated Maritime Policy by conveying and deploying national policies at the regional level;
- Become a reference actor in the area of maritime affairs, while enhancing the visibility of the territory and its members through the 'Pôle Mer' label. At the same time, consolidate the Pôle's leadership position in the Mediterranean basin, while focusing on a business-oriented strategy to support its members; and
- Become an enabler for business competitiveness through the structuring and coordination of value chains.

Competencies development and internationalisation dynamic are at the core of the Pôle's strategic objectives for the period 2013-2015. Overarching challenges for the cluster in the near future are:

- Capture the competencies needed for future maritime economic activities;
- Develop trans-boundary cooperation in the areas of education, training and competency development; and
- Connect and integrate existing maritime value chains.

³⁵ [Http://www.polemerMediterranee.com/Pole-Mer-Med/Missions-enjeux](http://www.polemerMediterranee.com/Pole-Mer-Med/Missions-enjeux).

Lessons for other clusters

- Competencies can successfully survive the decline of a primary sector if these are reinvested into a diversified set of activities and integrated along different value chains by placing the territory, its natural endowments, and its existing infrastructure at its centre;
- The national cluster policy initiative has been crucial in supporting the foundation of the Pôle Mer Méditerranée. However, this would not have happened without the existing collaboration between a group of businesses and regional research institutes, or without the key support of local and regional public bodies;
- The establishment of appropriate inter-linkages amongst local players (including in particular the research and innovation stakeholders) has reinforced the growth potential of the regional economic offer. Indeed, strong local and regional involvement has focused on maritime activities for which there is still room for enhanced competitiveness vis-à-vis other global actors;
- Despite being part of a broader cluster initiative encompassing several sectors, the Pôle is mainly the result of a local initiative aiming at stimulating traditional territorial specialisations of the Toulon area and boosting traditional maritime economic activities (shipbuilding, ship maintenance, reconversion, ship repair); and
- On its territory, the Pôle Mer Méditerranée actively contributes to the identification and optimisation of competency matches in terms of offer and demand, by linking its member businesses and SMEs to local education and training institutes as well as by 'labelling' training courses.

3.4 NAPA: Fostering cross-border cooperation

Main features of the cluster

NAPA, the North Adriatic Port Association, was formed in 2009 and now includes the ports of Venice and Trieste in Italy, Koper in Slovenia, and Rijeka in Croatia. NAPA promotes the improvement of the Baltic-Adriatic corridor, and to allow the NAPA ports to become a major European logistic platform for traffic from Far East to Central Europe.

The cluster's objectives are to:

- Provide a viable alternative to the established Northern European Ports;
- Reduce inland infrastructure burdens through the sharing of logistical services and construction;
- Support balanced North-South regional development; and
- Reduce the environmental impact of shipping by reducing overall shipping distances from the east compared to the northern and other European ports.

Key activities include:

- Joint marketing at International fairs around the world;
- EU projects across a range of programmes;
- Studies and activities including marketing studies and memoranda of understanding with other regions or organisations;
- Setting environmental standards in port operation and in areas such as capital and maintenance dredging; and
- To protect the joint Adriatic waters and to comply with ever higher environmental regulatory requirements, safety and security³⁶.

³⁶ (e.g. the EC's Birds and Habitats Directive, the Water Framework Directive and the ISPS code).

The cluster has set ambitious targets for future development: to increase by about three times the present volume of container handled in the North Adriatic Ports by 2030; to combine the strengths of the four ports in order to cooperate in the development and implementation of environmental protection measures - the cluster aims to reduce emissions and to create efficient and sustainable logistic chains³⁷; to address common environmental challenges; to harmonise ports regulations and services; and, to develop common proposals for EU grants towards studies and scientific analyses on key issues.

Membership is currently restricted to named port authorities, however this disguises the complexity and diversity of the port operations and commercial engagement within the ports as separate concessions or profit centres. NAPA also recognise the potential for wider sectoral membership from areas of research and innovation, logistics, and wider employment.

Future developments and possible barriers

The ports support a strong logistics sector in the regional hinterland beyond the port gates, with a considerable economic 'spill-over' into the local economy including a wide range of small and medium enterprises and micro-businesses.

If the NAPA ports are to fully realise their ambition, a stronger collaboration with the research and training sector would seem to be a logical development. This would be either as 'cluster-light' with informal, non-contractual relationships with research and training institutes, or through deeper collaborations in long-term partnerships.

NAPA has amply demonstrated the success of cross-border collaboration in a very short space of time following the progressive EU enlargement in the Adriatic region. The cluster is well placed geographically and institutionally to further benefit in current and future EU programmes. NAPA is also strategically located on two Core Network Corridors in the TEN-T network.

By reason of its existing and potential scale as a maritime logistics hub, NAPA will be a key player in the macro-regional strategy EU Strategy for the Adriatic-Ionian Region (EUSAIR). The role of national and local governments in the region will be critical in creating an enabling environment.

The NAPA cluster is at a relatively 'emerging' early stage in its development and is showing very strong potential for future growth if measured in terms of port volumes and efficiency. However, as a cluster there are a number of areas that could act as barriers to the development of an integrated cluster, rather than as a loose confederation in terms of its membership, diversity and range of activities.

By comparison with a successful mature cluster there are number of actions for NAPA to consider:

- Centralised governance. NAPA currently lacks the centralised organisational structure, and such a centre could provide a single point of access, project management and coordination;
- Development of common R&D. This is recognised as a potential weakness by NAPA itself, and the cluster has yet to develop a common training and education strategy;
- Collaborate to achieve environmental benefits. This involves minimising negative environmental effects and risk in areas such as capital and maintenance dredging, and meeting regulatory standards and codes. More advanced collaboration can exploit the potential of clean technologies and actions to help ensure a healthy marine ecosystem; and
- Promotion from Nucleus to Cluster, involving widening the focus on global marketing to include local expansion within the sector or related maritime economic or logistical activities.

³⁷ NAPA ports will apply for EU grants to address common environmental challenges at NAPA level, within the framework of the "2020 EU Strategy" (e.g. use of alternative fuels and LNG).

Risks are the transition of public ports into the private sector through sector reform leading to cluster break-up.

Mechanisms to overcome barriers are:

- Although NAPA has a very clear vision and strategy and an action plan, it lacks a business plan specifying in detail how this is to be achieved; and
- The role of national and regional governments in creating an enabling environment is critical.

Lessons for other clusters

NAPA is seen as a model of such a Multi-Port Gateway and has already been used as a model for the potential port clusters in the Black Sea (see Annex I for an overview of relevant clusters).

3.5 Piraeus: Addressing a complex value chain

Main features of the cluster

Piraeus is characterised as a mature, place-based, informal cluster. The leadership involves primarily the public and semi-public bodies, but also includes professional bodies from the private sector according to their power of influence. The cluster was initiated in the early 1960s, when ship owners chose Piraeus as their operation centre due to the implementation of favourable tax and labour regulation and legislation. The main economic activities identified include deep-sea shipping, short sea shipping, passenger ferry services, cruise tourism and catching fish for human consumption. Additional maritime economic activities (MEAs) include shipbuilding (currently in stagnant phase), yachting and marinas and coastal tourism. Employment is estimated at 10,000 jobs for the public sector and about 37,700 direct jobs in the private sector (2,900 firms). Key achievements of Piraeus port include a leading shipping nation, ranking 1st in the world with 15% of DWT (deadweight tonnage), ranked 3rd in terms of TEU (twenty-foot equivalent unit) in the Mediterranean, a throughput volume of about 15-20 million passengers per year and 1.15 million cruise tourists, and a car terminal with 450,000 cars loaded and unloaded mainly for North Africa, the Black Sea and the Middle East.

Future developments and possible barriers

The study focused on a diversification strategy based though on Piraeus competitive advantages and existing maritime sectors. This diversification is oriented towards five main opportunities that can add value to the cluster:

- Based on the role of Piraeus as gate to the Balkans and central Europe, the diversification involves a switch from transshipment to transit transportation and the creation of a new multimodal transportation hub that will act as a logistics and distribution centre, including assembly and light manufacturing units. The switch is feasible due to international players strategies and improvement of the national railway infrastructure;
- Based on the boosting cruise sector, as well as the climatic and geographical features of Piraeus, the diversification involves a switch to home-porting (also taking advantage of increased connectivity of the Athens international airport) instead of being just a port-of-call;
- Providing added value to the car terminal by creating centres in partnership with the car industries with terminal modifications according to market preferences;
- Investment opportunities for ship repair/retrofitting due to new environmental standards set on international shipping may revitalise the specific sector. Controls on the content of gas emissions, filtering devices, alternative fuels, LNG, ballast water and sediments control imposed by the International Maritime Organisation, and the expected expansion in Mediterranean and Black Sea

areas create new activities and stimulate development and wide scale adoption of new technologies³⁸. Companies from Piraeus cluster have already moved towards this direction³⁹; and

- The presence of shipping companies is of paramount importance for Piraeus and policies should focus on creating a supportive environment so as to keep them in Piraeus and to expand their links with the Greek maritime supplier industry.

An issue that has horizontally positive effects on the overall competitiveness of Piraeus is the elaboration and implementation by the Port Authority of specific environmental policies, which aim at the continuous improvement of its environmental performance according to European and international standards. As a result Piraeus has been certified since 2004 and was recertified in 2014 (for the fourth consecutive time) according to the PERS (Port Environmental Review System) standards of the European Sea Ports Organisation, after the evaluation of Lloyd's Register. Piraeus has the status of an Eco-Port and it is part of the Eco-ports network⁴⁰.

The most prominent internal barriers include bureaucracy, resulting in lack of action or delays in action by the central government that leads to lost opportunities for Piraeus, uncompromising labour unions, and low competitiveness in the ship repair industry. Spatial congestion will soon become an issue and there are thoughts and plans for relocating some of the port activities. Cruise operators pinpoint the lack of common cruise port policy throughout Greek ports, including common port and services tariff philosophy, berthing and security standards. An absence of ship repair activities limits the cluster's value.

Solutions to address the barriers include: strategic alliances that are a key policy to boost clusters value; better labour relations; possible relocation of some port activities to avoid possible congestion, and a new spatial planning of port facilities is needed in order to permit the fully expansion of activities in alignment with city planning; guaranteeing the support of local population possibly by addressing negative impacts-environmental, land use and traffic impacts; and, finding niche markets and/or subcontracting for ship-repair industry, provided that the working framework of this sector adapt to today's conditions. Institutionalisation of the cluster will facilitate the implementation of the above solutions, and it will create an 'incubator' offering supportive environment for policy compromises and the development of complementarities.

Lessons for other clusters

The main lessons learnt from Piraeus are:

- Port cities and mature clusters cannot abandon their range of activities. Instead, they have to base their future potentials primarily on increasing the value of the existing sectors that form their economic base;
- Full exploitation of competitive advantages that each cluster possesses is a more secure way to future development. Therefore if the cluster is not an R&D generator it is better to count on transfer from more developed clusters, or to participate in research networks. If there is a field of innovative potential, financial support is needed;
- Communication of best practices is of primary importance, but presupposes a better activation of European relevant networks and mobility to participate from the cluster's part;
- A stable policy framework is a *sine qua non* condition for the development of the cluster; and
- The benefits of developing strategic alliances with global key players for operational efficiency and expansion.

³⁸ RICARDO-AEA, *Support for the impact assessment of a proposal to address maritime transport greenhouse gas emissions*, Report for European Commission-DG Climate Action, 13/1/2013

³⁹ <http://www.nazo.gr/images/stories/News/BOOKLETGreenTechnologiesRetrofitsinGreece.pdf>.

⁴⁰ <http://www.ecoport.com/notice/16/ports-of-piraeus-bremen-bremerhaven-and-aqaba-receive-high-environmental-recognition>.

Institutionalisation of the cluster is essential for political synthesis of sometimes diverging interests of various stakeholders, and operational effectiveness.

3.6 IDIMAR: Making best use of strong local potentials

Main features of the cluster

Considered as a policy-based cluster, IDIMAR was launched in 2009 in response to a demand from companies and under the auspices of the regional Government with the objective of promoting the innovation in the sea-sector in the Balearic Islands. The sea-related sector in the Balearic Islands is fragmented and composed by a large number of established associations responsible for lobbying and representing the interests of the sector. In this context, and in order to find its own market niche, IDIMAR has positioned itself as the tool to put together those relevant sea-related actors who want to cooperate and work together to develop new products, services and processes to create added value and improve their competitiveness in the nautical sector. Its final objective therefore is to become a benchmark in innovation in the region sea-related industry and a driving force to foster and promote its culture of innovation.

The cluster it is still in an emerging phase and, although it has made an important effort for laying the foundations for the triple-helix actors to cooperate. At present the patterns of cooperation between the different actors are not yet sufficiently well-established.

The Balearic Islands region can be considered as a pole of excellence and an international outstanding area, in terms of sailing and nautical-related activities sector. While the Mediterranean accounts for over 70% of global nautical tourism, the region attracts around 25% of this percentage. At Spanish level, its importance is also remarkable. The Balearic Islands is the first Spanish region in terms of nautical sports facilities with a total of 94 installations representing a 20.9% of the Spanish facilities. The region also has 36 facilities representing 12.5% of total Spanish marinas, and 19,111 moorings, which counts for 15.3% of total moorings in Spain. This corresponds to an average of 55 inhabitants and 461 tourists per mooring.

Future developments and possible barriers

This leadership is determined by a number of important assets and competitive advantages, related to its strategic location and well-preserved natural environment, the fact of it being a top tourist destination, the industrial and knowledge services available (including the presence of top European marine research centres), as well as other socio-cultural and intangibles assets such as the internationally-renowned brand of Balearic Islands or the political and economic certainty (in contrast with other tourist destinations in the north Africa and Caribbean).

The islands present an important number of opportunities. Over 13 million visitors every year profit from the international character of the Balearic Islands. Strengths include: very experienced local port authorities; a number of companies based in the region being leaders in certain nautical market segments; nautical international events that happen throughout the year in the Balearic Islands; the existence of well-developed knowledge/research centres; the strategic geographical situation for nautical and sailing activities of the region; and, the lessons learnt from good practices developed by top firms in the hotel and accommodation sector that could be capitalised by the nautical and sailing sector and the growth potential of the cruise industry in the region.

The sector finds a number of challenges and barriers that hinder its development. These challenges involve:

- The lack of a clear and straight-forward regulatory framework;
- The lack of sufficient funding to carry out innovation and R&D in the sector;
- A low cooperation culture in the maritime sector;
- An educational system that is unable to provide the required professional profiles;
- Low levels of public private cooperation or public-private partnerships; and
- A limited cooperation between the triple helix actors in terms of innovation and development.

Overall, an average potential for growth of the sector is expected and the objective of the region should be to capitalise and make best use of its strong local tourism industry sector, so as to boost top quality coastal and nautical services.

In this context, the opportunity of IDIMAR for the following years is to be considered as being an intelligence-gathering platform that serves coastal and nautical tourism, and which contributes to the achievement of Balearic leadership in the nautical and sailing industry.

Lessons for other clusters

The main lessons learnt from IDIMAR comprise the following:

- Each cluster needs to identify its own market niche and *raison d'être* in a dispersed environment composed of a number of organisations aimed at promoting and supporting the sector. For IDIMAR this means a high degree of specialisation in sailing and nautical activities where the region counts with important assets and competitive advantages; and
- In the context of the current economic and financial crisis, companies have to make an extra effort to promote the innovation and improve and increase its competitiveness in order to operate in an increasingly competitive environment. Cluster initiatives as IDIMAR are essential for promoting innovation and competency development and thus improving the competitiveness and development of the region.

4 Exploiting the benefits of maritime clusters

4.1 Revisiting the rationale and interpreting the patterns of maritime clusters

4.1.1 A starting point: producing synergies

Maritime clusters⁴¹ are a potentially powerful tool to stimulate innovation, growth and jobs. They enable an increase in productivity and operational efficiency. Clusters ensure improved access to specialised inputs, services, employees, information, institutions, training programmes and other public goods and ease coordination and transactions across firms. They also aid a rapid diffusion of best practices and help firms to make on-going, and meaningful performance comparisons. Such comparisons provide incentives to improve performance vis-à-vis local rivals. The proximity of rivals, in turn, encourages strategic differentiation. Clusters stimulate and enable innovations, and the density of clusters facilitates the recognition of innovation opportunities.

In the context of the clusters studied, it has not always been clear where this potential comes from, whether clusters are a 'mirage or a miracle'. Particularly in weaker clusters, it can be tempting to 'import' good practices and lessons from successful cluster experiences elsewhere, including those from other sea-basins. However, during the research we have identified a certain resistance amongst the stakeholders concerned to 'copy and paste' such cluster formulae from elsewhere.

Indeed, an important finding of the study is that **actors in the Mediterranean and Black Sea region are increasingly aware of the need to construct competitive advantage through maritime clusters**, and that this is a trial and error process. There is no one-size-fits-all and no single solution. We will develop this chapter around how the benefits of maritime clusters can be exploited, and how the potentials and challenges can be identified and built on.

4.1.2 Critical mass and trajectories to maximise potentials of clusters

Bringing about synergies requires critical mass⁴², involving a sufficient number of members. As stated in Chapter 2, a number of 50-60 members (Pôle Mer Méditerranée, NAPA, and IDIMAR) appears to be a minimum in order to recruit a cluster manager and basic support staff. Emerging clusters (for example, Marine Cluster Bulgaria) are not that size yet, which hampers the cluster development. Maritime clusters face particular challenges in finding this critical mass. Diversification (or multiple specialisation) is a common strategy to expand the membership basis (Pôle Mer Méditerranée, Piraeus), although some form of specialisation is important as a starting point (nautical tourism, IDIMAR).

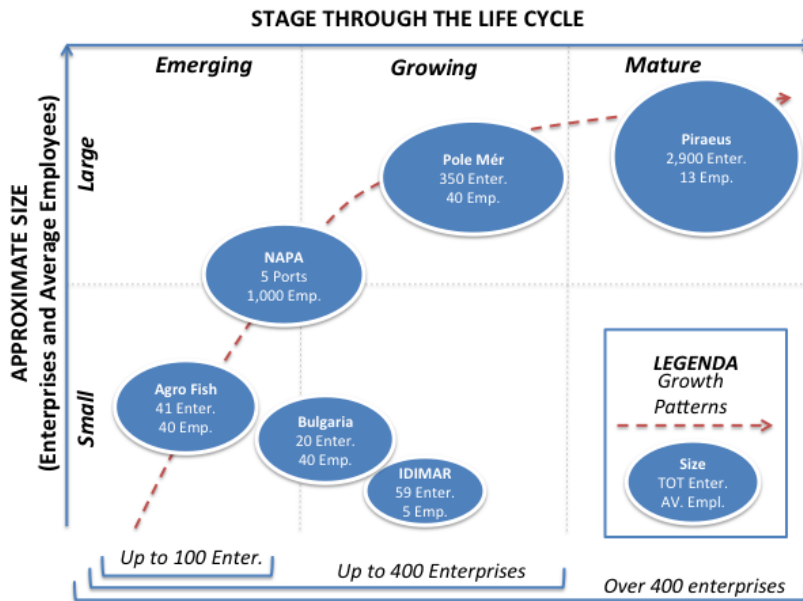
Critical mass is not an aim in itself, but rather is the means for assuring intensive and effective cooperation, exploiting clustered companies' market potential, and defending their position *vis-a-vis* incumbents and emerging local and global competitors. Once reached the sufficient critical mass, the cluster is expected to follow growth (Fig 4.1) based on a self-augmenting process⁴³. However, **gaining and maintaining such critical mass is a struggle for all maritime clusters**.

⁴¹ Within the context of this study, we have made use of the definition of cluster made by M. Porter and defined maritime clusters as "a geographically proximate group of interconnected companies and associated institutions in the maritime field, linked by commonalities and complementarities (external economies)". More specifically, we have interpreted this interconnection between stakeholders according to the "triple helix" approach, where academia, industry and government operate in a coordinated way in order to accelerate value creation in certain economic activities.

⁴² The notion of "critical mass" is introduced in Chapter 2.5 of this study, where a full analysis of size and employment generated by maritime clusters is provided.

⁴³ Clusters and clustering policy: a guide for regional and local policy makers (2010 - Chapt. 3.2.5/3.2.7/3.3.1) <http://cor.europa.eu/en/Archived/Documents/59e772fa-4526-45c1-b679-1da3bae37f72.pdf>.

Figure 4.1 Growth patterns of maritime clusters through the life cycle and development trajectories



Source: Maritime clusters mapped and assessed for this study

Depending on different stages across the cluster life cycle, diversification or specialisation strategies (trajectories) can help reaching or maintaining a critical mass (as the Fig 4.1 illustrates). Emerging clusters need to find their place and unique selling point by initially focusing (for example, on aquaculture in AgroBioFishing, nautical sector in IDIMAR, and maritime transport in NAPA), while also diversifying along the way. Diversification represents a potential strategy to both assure and sustain a maritime cluster critical mass at a growing stage. The re-definition of the core business comes into play in later phases of the cluster life cycle (mature and potentially declining clusters). Gaining and sustaining a good critical mass implies maximising potentials and mitigating challenges for maritime clusters.

Maritime clusters often show a rapid increase in the number of clustered companies through the emerging phase of their life cycle. Although their membership base is not always enough sizeable to assure self-sustainability, it usually allows sufficient capacity to apply for international funding opportunities and finance basic innovation across associated enterprises. In some cases, the membership expansion continues through the growing stage, and allows maritime clusters to shift from an initial model of public-supported policy-based initiative toward a self-sustaining activity. Growing clusters can promote a range of diversified initiatives across high-potential value chains within selected Maritime Economic Activities, as the case of the Pôle Mer Méditerranée in France.

Founded in 2005 with the name of “Pôle Mer PACA”, the Pôle Mer Méditerranée has been one of the selected clusters by the French Government. Since then it has been increasingly expanding by involving a broader network of 168 small and medium enterprises, 80 larger business groups and companies, 73 research and training organisations, as well as 33 members of the ‘ecosystem’ of the Pôle (including professional bodies, consultants, banks, etc.), and is now planning to grow internationally across the sea-basins. Recently, Pôle Mer Méditerranée was awarded the label of “pôle à vocation mondiale”, stressing the aim to further develop globally and to foster international synergies.

Maritime clusters can also benefit from the single EU market and grow rapidly, by connecting small-to-medium locations (i.e. ports) in neighbouring countries across a sea-basin into a much larger and globally competitive entity. This is the case of the North Adriatic Port Association (NAPA), a maritime cluster formed in 2009 to “form a European logistics platform, in particular with regard to servicing the

markets of the Far East as well as Central and Eastern Europe" (NAPA Strategic Vision), by promoting "Coopetition", meaning to cooperate internationally, whilst competing internally. Geography is in fact the first key to understanding the formation of the NAPA cluster. The NAPA ports - Venice, Trieste and Ravenna in Italy and Koper in Slovenia, aim at providing the cheapest maritime route from the Far East via the Suez Canal to Europe, with a distance that is about 2,000 kilometres shorter than other North-European ports. The second key to understanding the formation of the NAPA cluster is the removal of border restrictions, following EU enlargement in the region.

Even when rapidly growing in the emerging phase, recently activated maritime clusters seem to have a relatively high mortality rate. Indeed, many maritime clusters may not reach a minimal critical size. This fact, sometimes due to structural difficulties beyond the capacity of cluster management to intervene (e.g. Marine Cluster Bulgaria), may challenge any further development for the clusters.

The Marine Cluster Bulgaria is operating within a difficult economic environment limiting its capability in reaching a sufficient critical mass. In part the economic stagnation in Bulgaria has caused a drop in the activities within the maritime sector and substantial job cuts, a situation which is difficult for the sector to overcome. Furthermore, due to the institutional complexity of the Bulgarian administration (notably the highly centralised management of Port Authorities), the possibility of local actors to define bottom-up strategies essential to maritime clusters is very limited. International cooperation is also problematic, and developing strategic partnerships with other maritime enterprises and clusters from across the Black Sea-basin is yet another challenge, as EU funding and supporting programmes differ from country to country across the sea-basin.

On a different level, **maritime clusters may be challenged by the need to balance diversification whilst maintaining a certain level of focus**. Lack of clear positioning may pose specific identity issues and be a challenge for clusters aiming at rapidly expanding their membership base.

IDIMAR provides an example in this respect. Being focused on the promotion of innovation in the sailing and nautical sector of the Balearic Islands, it needs to overcome the fragmentation of a large number of established associations, actors and stakeholders, and be responsible for lobbying and representing the interests of individual companies of the sector. Given the fragmentation of the local economy in nautical and sailing services and products, IDIMAR's main objective is to become a central and useful tool for innovation in the Balearic Islands sea-related industry, and a driving force to foster and promote its culture of innovation. And yet, IDIMAR still needs to find its own market niche and specialise in areas where the cluster can demonstrate a clear added value, maximise its visibility, and attract a larger base of associated companies so to keep growing.

4.1.3 *Do maritime clusters differ from mainstream clusters?*

The analysis of selected clusters and the local discussions held with stakeholders across the sea basins has allowed this study to point to some clear findings. First, maritime clusters have **far from identical development trajectories**, which can take place both by specialisation and/or by diversification.

If specialisation represents the starting point for the definition of a cluster identity, diversifying along the way is what ensures a higher critical mass and sustainability. Maritime clusters' competitive advantages are often rooted in existing (traditional) sectors and, for this reason, it is of primary importance that they **focus on real economic competitive factors and expand through diversification** in order to increase their value added. This diversification may take different forms: by keeping the existing sectors and in parallel boosting new and more innovative maritime sectors (the case of Pôle Mer Méditerranée); by diversifying towards other sectors through emerging and/or mature

activities (the case of Varna, through container transport or seaside maritime tourism); by diversifying in terms of geographic positioning and role (the case of NAPA, which is striving to establish its profile as a gateway European entry); or, by diversifying to new products or services of the existing sectors (the cases of Piraeus and IDIMAR).

The characteristics of the economic sector in which clusters operate influence their behaviour. Mainstream cluster policy tends to only focus on specialisation. This is needed to bring about international or even global leadership in niche products or services. Specialisation allows for externalities, drawing in specialised institutions and labour, and enhances visibility. However, this recipe seems not to work so well for maritime clusters as highly specialised maritime clusters often fail to have critical mass. After all, the maritime economy is more limited in size and many maritime economic activities take place in less populated zones, including peripheral regions and islands. Here an important difference between maritime and mainstream clusters can be discerned, as **diversification appears to be key in maritime cluster development**.

Due to relatively limited number of specialised actors in the maritime economy, if the required critical mass is not reached (e.g. not a minimum number of members of the cluster), it becomes difficult to undertake professional cluster management. Hence, it becomes logical to look for (other) maritime economic activities, as demonstrated by the Pôle Mer Méditerranée, as well as by the reinvention of the Piraeus cluster. Indeed, the reaping of Blue Growth synergies, through a common infrastructure, common competencies, common marketing and common identity and culture, appears to favour a course of diversification (or multiple specialisation) rather than (single) specialisation.

4.1.4 *What is specific about maritime clusters in the Mediterranean and Black Sea?*

The study has above all confirmed the need for innovation, growth and jobs in the Mediterranean and Black Sea, perhaps more so than ever before. The economic and financial crisis has hit the sea-basin to a disproportionate extent, with bankruptcies, unemployment and increased poverty.

The crisis partly explains why initial and embryonic maritime cluster developments have had difficulty to become established in the last five years. Economic actors have all been too busy in surviving the crisis. However, the economic and financial crisis has also provided an opportunity, namely the recognition that future growth needs to be derived from competitiveness which is built up from a unique set of endowments, differing from place to place.

When comparing the mapped maritime clusters with the features of maritime clusters in northern EU (e.g. North Sea, Baltic Sea), some specific elements emerge:

1. **Less favourable macro-economic conditions**, including economic growth and markets, access to finance, and institutional support;
2. **Smaller size and limited critical mass** of southern maritime clusters in Europe, if compared to the relatively larger (on average) northern clusters, although with some relevant peaks of few big mature clusters (i.e. “national champions”);
3. **Lower degree of maturity**, as maritime clusters in southern Europe tend to be rather ‘recent’ and in an emerging stage, whereas northern Europe practices are generally more mature;
4. **Higher presence of informal clusters**, which may also represents a reason why delineating clusters in the Mediterranean and Black Sea proves to be so difficult. Southern European cultures tend to be based more on informal forms of cooperation, while Northern European experiences are mainly related to formal cluster cooperation models. Indeed, the Italian industrial districts (a model for economic development in the 1980s and 1990s) often did not even have formal cluster bodies. As the analysis in Chapter 2 points out, a difference needs to be made between the local

economic basis for informal exchanges and a formal cluster organisation. Within the case studies, all clusters had some form of cluster organisation apart from Piraeus.

4.2 How to generate benefits through maritime clusters

The concept of (maritime) clusters revolves around mechanisms to increase productivity, growth and jobs. This is achieved by producing externalities or synergies that can be grouped as follows:

- **Business-to-business and research cooperation.** Enabling new forms of cooperation across sectors, and building new value chains of products and services. Proximity helps to boost such cooperation, but cluster activities can further enhance this process. The triple helix approach involving business, research and government actors is a powerful concept in this respect;
- **Competency development and knowledge sharing.** Clusters provide a locus for the labour market, retention and development of skills which are essential for building competitive advantage, and which extend beyond the borders of individual firms. Those able to attract the best skills have a decisive advantage over others. Cooperation with specialised educational institutes in the area of training are of mutual advantage;
- **Marketing and visibility.** Joint promotion of the cluster, its members and their products and services internationally is an important synergy and an important reason for companies to collaborate;
- **Smart infrastructure and planning.** Maritime clusters require the sharing of infrastructure, including ports, inland infrastructure as well as zoning of activities. Not all maritime economic activities go well together, and intelligent and integrated physical as well as maritime planning are required to prevent tensions; and
- **Trans-boundary cooperation.** In its form of cross-border, transnational and international cooperation, it enables access to markets, allows clusters to jointly address future challenges, and supports benchmarking and learning.

Bringing about the above synergies requires above all **professional cluster management**, time and dedicated efforts by a skilled support staff. For this reason, these synergies will be further presented below, by highlighting the potentials and challenges from the perspective of cluster managers.

4.2.1 Business-to-business and research cooperation

Bringing together actors in a 'triple-helix' cooperation (private companies, public bodies, research community) is a fundamental task for clusters and is their *raison d'être*. Most of the stakeholders agree that links among public authorities, training and research organisations, as well as private companies should be developed or strengthened to promote an innovative and competitive Blue Economy across the Mediterranean and the Black Sea. The discussions held in the local focus groups suggested that there is room for improvement in this field, namely to solve issues such as the reluctance of firms to cooperate with each other (as reported by NAPA, Piraeus, IDIMAR), the insufficient cooperation with the research community (as stressed in Koper, Piraeus and IDIMAR), and problems in the working relationships between research institutes and the private sector firms, arising from different interests and attitudes between the two communities (as highlighted in AgroBioFishing - Palermo).

Potentials

One of the key points which have emerged from the case studies is the need for maritime clusters to find their competitive advantage and invest on it. It does not matter where this advantage stems from. It can be a physical endowment (like a favourable geographical location) or the outcome of a more sophisticated process such as constructed competitive advantage.

Nevertheless, **finding the competitive advantage** is necessary, but is not sufficient to guarantee success. There are examples in maritime sectors and activities of a sudden catastrophic downturn, following a long prosperous period (the port of Liverpool, and the shipbuilding sector in many European countries). With the global economic environment facing dramatic societal changes and requiring the continuous development of knowledge-intensive technologies, winners are those who embrace continuous evolution, and who adapt innovatively to changes.

This is clear in the case of Piraeus, which was once a prosperous and world famous shipping centre, but which started declining and stagnating. However, prospects can return by reinventing the centre, by expanding and renewing value chains and by attracting new global key players. Innovation and adaptation to changes is also expressed in the case of Pôle Mer Méditerranée which, by capitalising and investing on the maritime competences already existing on the ground, managed to create a new agenda for the subsistence and transfer of this valuable know-how.

It is therefore very important that the cluster fosters **exchanges among its members** and supports them in accessing new, international markets. A key component of any high performance cluster, when it comes to knowledge sharing and collaboration amongst businesses, research and local administrations, is the extensive informal and formal networking between firms, even competing ones, and research organisations across the cluster, as well as between firms and their supporting infrastructure. This inclusive process is a strong path to generate the extension and diversification of value chains.

Strategic alliances are important to generate benefits through maritime clusters and increase business cooperation and viability. Piraeus owes a lot to its increasing path to Chinese company COSCO. Its establishment in Piraeus became the driving force for the renewal of the cluster. From a different perspective, the Spanish maritime cluster IDIMAR highlights that the lack of global or international players with local headquarters is a limiting factor that inhibits sector dispersion along with its emerging cluster stage.

The issue of continuous adaptations is strongly linked to research needs. Though most of the clusters analysed through the case studies cannot be considered as highly innovative and with strong research activities (Pôle Mer Méditerranée can be seen as an exception), stakeholders recognise the **role of research** in keeping clusters innovative and competitive. Research is heavily based on the existence of highly specialised and creative universities and research centres. Nevertheless, this is not the case for many of the regions studied.

Ensuring a **sound environment** is vital for the functioning of several economic activities that constitute part of maritime clusters, like coastal tourism, fisheries, aquaculture and yachting and marinas. Therefore business-to-business and research cooperation cannot neglect this as such sustainable blue growth is critically dependent on well-functioning marine ecosystems. In innovative maritime clusters where research and business actors are working hand-in-hand, the private sector is in good position to contribute to change towards a more conscious use of sea resources, which recognises the value of ecosystem services.

Challenges

Regarding the business-to-business cooperation the main challenges revealed by case studies were:

- Business cooperation is created through market dynamics. In the case of clusters though, when a firm does not cooperate with a business associate in the strict sense, the benefits of cooperation must be more visible. That is why some of the case studies indicate a lack of cooperative spirit among firms;

- National and/or local governments must create a stable environment, eliminating unnecessary deficiencies, so that the terms of the play are crystal clear;
- In the same context a coherent maritime policy in national level and maritime clusters policy specifically would work towards the same direction; and
- In several case studies the problem of adequate funding resources for research was mentioned. Research is a privileged field for transnational cooperation that multiply the positive effects.

4.2.2 Competency development and knowledge sharing

Shortage of maritime skills was identified as a main challenge in the Governance Focus Group held in Brussels and a major drawback in cluster competitiveness. Due to the enduring lack of internal dynamism, even clusters with a long tradition in marine education like Piraeus face deterioration on the quality of educational programmes. IDIMAR also notes the lack of an attractive and articulated educational proposition for sea-related activities. To address these problems, competency development and promotion of the mobility of maritime skills across countries and sectors were stressed as important in Pôle Mer Méditerranée focus group.

Regardless whether the economic development takes place in the Mediterranean, Black Sea or elsewhere, the enhancement of technical and economic competencies at the international level is of absolute necessity for the further development of maritime economic activities and their potential to create economic growth and employment. **Skills and knowledge often are scarce resources**, and those who have them are more likely to succeed in a globally competitive world.

The Mediterranean accounts for over 70% of global nautical tourism and the IDIMAR cluster aims at further developing this potential. The Pôle Mer Méditerranée is at the forefront of developing emerging maritime economic activities such as marine energy and marine mineral resources. These are two examples where the economic development of certain maritime economic activities actually takes place (at least to a certain extent) in the Mediterranean.

Clusters are understood to be linked to a geographic area, however, the maritime world is global and employees of the future must be able to act on a global market (global supply chains, global industries). Hence, internationalising maritime programmes and having an international perspective is of great importance in the attempt to attract the most competent employees.

Potentials

Clusters provide a locus for the labour market, retention and development of skills which are essential for building competitive advantage, and which extend beyond the borders of individual firms. Those able to attract the best skills (notably but not only engineers) have a decisive advantage over others.

Quite a number of maritime research themes and challenges tend to be geographically localised or at least regionally specific. Therefore the geographic proximity of members of a particular maritime cluster can be considered as a positive factor facilitating more intensive collaboration. Within a cluster it is more likely that the knowledge that is specifically needed in this region is produced and then actually directly applied.

For maritime clusters it is essential to ensure the **links between education, research, business and authorities**. In that way skills and competences generated from education and research become practically applicable and generate added value in the region. On the one side, because skilled people are kept in the region as they can work (preferably) on a high level in the domain they have studied or been trained. On the other side, education and research are more directly focused on the actual needs of the cluster.

Hence, focus must to a higher extent be on the combination of innovation, operation, processes and product, and on service development, thus benefiting the industry. As such, the triple helix structure which is often named as a necessary characteristic of clusters aiming at innovation needs to be rather understood as a **quadruple helix** where education as a fourth pillar complements research, business and the public sector. Only the interaction of these four pillars allows to create the competencies and to retain them in the region.

The French cluster acts as a collector and depositor of knowledge and ideas while creating the underlying infrastructure, which in turn facilitates the flow of knowledge and learning dynamics. Cooperation with **specialised educational institutes** in the area of training is of mutual advantage. The case of Pôle Mer Méditerranée points to the fact that it takes time to develop such competencies, but that they remain vital also after periods of crisis and restructuring. As in the case of Pôle Mer or IDIMAR, a future strategy for skills development and knowledge creation in the maritime clusters of the Mediterranean and Black Sea must be based on the competencies and knowledge that the respective maritime clusters already possess.

Maritime clusters studied are often struggling to find a proper balance between the local critical mass and affinity facilitated by the geographic proximity of their members, and the open character of collaboration outside the clusters where partners pro-actively seek knowledge and contribution from other maritime research and economic actors in other regions.

Building on existing competencies, maritime clusters studied realise the need to prioritise research and education in order to further develop the cluster, create innovation and generate growth. In this regard, it is also important to support transversal research and education, for example in maritime logistics. The Marine Cluster Bulgaria has established a high-tech educational centre for professional training in the fields of marine logistics and trading operations in order to capitalize on existing know-how and further diversify it towards more innovative areas.

For maritime clusters it is important to understand their current competencies and skills relevant to their maritime economic activities, their research, education and training facilities, and the potential for their cluster activities to facilitate innovation.

Challenges

The major challenge in the Mediterranean and Black Sea in years of economic crisis is to **break the downward spiral** in many traditional maritime economic activities. Industries are facing a severe crisis, which leads to reductions in investment and innovation, job cuts, or even the closing-down of sites. This can induce a (gradual or sometimes even steep) decline in education and research investments, which further reduces the competitiveness of the sector.

As it has emerged in the case studies, maritime clusters with a long tradition in marine education face a **decline in the quality of educational programmes**. Piraeus but also IDIMAR note the lack of an attractive and articulated educational proposition for sea-related activities. Partly these emerging deficits in marine education are linked to an overall decreased competitiveness (and thus attractiveness) of traditional maritime economic activities in the Mediterranean and Black Sea. Becoming a naval engineer when the shipyards are closing down is not an attractive prospect. Still the case of Pôle Mer Méditerranée suggests that it is absolutely vital to preserve the valuable traditional competences, to develop them further and to adapt competencies to new challenges and finally to reapply them into new areas of application.

It remains a challenge for many clusters to determine **how existing competencies can be applied** to new maritime uses, or to emerging maritime economic activities. The analysis on a set of selected clusters (phase B of this study) revealed that in the Mediterranean and Black Sea regions maritime clusters tend to focus on more traditional maritime economic activities: short-sea shipping; coastal tourism; cruise tourism; shipbuilding and ship repair; deep-sea shipping; passenger ferry services; and, catching fish for human consumption. Clusters in other regions in Europe tend to display a more varied picture.

This pattern could be regarded as a possible sign of limited innovation in the Mediterranean and Black Sea regions. Thus the identification of competency and knowledge gaps that would impede developing a similar innovation pattern as those in other regions of Europe, defining a common strategy and action plan, as well as individual strategies for each cluster to address these gaps, constitute major challenges for the region.

To address these problems, the members of the Pôle Mer Méditerranée focus group stressed the importance of competencies development, and the promotion of the mobility of maritime skills across countries and sectors.

4.2.3 Marketing and visibility

Although the cluster concept was launched already two decades ago in the academic literature, and subsequently embraced by policy makers and politicians, it seems to be still poorly shared across stakeholders of the maritime sector in the region. This is particularly the case for members of the academia and policy makers in countries such as Bulgaria and Greece. Many entrepreneurs are not too familiar with the notion either. For this reason maritime clusters, as a practice and a concept, need to gain greater visibility both at the local and international level.

Some concrete actions were identified in the Governance focus group as good practice:

- **Labelling scheme.** The rationale for labelling schemes is that sellers assure buyers of certain characteristics and qualities of their services. Building on existing initiatives, the development of an EU labelling scheme for maritime clusters could attract more firms to clusters as it can be used as a marketing tool by them;
- **Events.** Among the various marketing tools, 'events' is the more interactive one. A face-to-face experience creates bonds among participants. Events focusing on maritime clusters create a common platform which brings together various stakeholders and facilitates the diffusion of cluster concept; and
- **Performance indicators-benchmarking-need for more data.** This is an area that other European clusters need to further elaborate too. Performance indicators and benchmarking is essential for identifying gaps in particular cluster's performance in order to then developing competitive advantages. It is also a way to give a sense of actual achievements to the clusters.

Joint selling of the cluster, its members and their products and services internationally is an important synergy and an important reason for companies to team up. For example, the Pôle Mer Méditerranée makes international trade missions to Brazil and Canada.

Potentials

At early stages, many clusters need to make themselves known and heard, both internally among stakeholders and externally among target groups and collaboration partners. They also need to increase the identification with the cluster among its stakeholders. This is very much about 'connecting the dots' in terms of developing linkages between actors in the cluster and creating awareness.

The role marketing can play to increase the visibility of a maritime cluster is two-fold, and relates to:

- The cluster's **internal promotion**: positioning of the cluster towards its (potential) members; and
- The cluster's **external promotion**: joint selling of the cluster, its members and their products and services.

The visibility and attractiveness of a cluster and the impact of the cluster management organisation within the local and regional economy depends on its size, age, institutionalisation and degree of industrial orientation. In our Phase B analysis the majority of clusters were either emerging or growing clusters and only 5 out of 19 were mature (the same applies to the focus group phase, where only Piraeus belonged to the group of the mature clusters). The mature clusters showed a significantly higher influence on the private and public sector than emerging or growing clusters, being less in need to promote their clusters internally. However, the majority of clusters are emerging and growing and their influence on the private and public sector is more limited. They would thus benefit from internal promotion, particularly in order to create a critical mass for the maritime cluster.

Increased visibility of maritime clusters can help to exploit the following potentials, which are preconditions for innovation and Blue Growth:

- **Skills attraction.** Clusters have the potential to become magnets for attracting skilled people and building competences. For example, clusters can showcase a pool of employment opportunities, and the presence of a cluster indicates a pool of employment opportunities for highly sought after skilled professionals, scientists and technicians;
- **Investment attraction and new firms.** Clusters can help attract investments, venture capital and promote the establishment of new firms. In particular small and medium enterprises (SMEs), which cannot rely on a well-known brand that large enterprises might have, can benefit from cluster reputation in this regard. Also the role of the public sector can help to make investments into an SME be perceived as less risky in the eyes of investors;
- **Economies of scale.** Cluster members can benefit from joint marketing mechanisms such as company referrals, trade fairs, trade magazines, and marketing delegations. This lowers the marketing costs for cluster members, which is especially attractive for SMEs with limited resources for marketing; and
- **Internationalisation and export promotion.** Cluster reputation enhances recognition of a location, it helps cluster members, particularly enterprises, to export their products and services. In this respect, some actions have been identified: Pôle Mer Méditerranée is developing actions in Brazil and Canada, and NAPA and Piraeus are establishing hubs of the East Asia-Europe trade corridors in the Mediterranean, whereas they are today more active in Northern Europe.

Challenges

This study has identified that the cluster concept is still poorly known amongst many entrepreneurs, policy makers and even researchers in the Mediterranean and the Black Sea. Only few focus groups referred explicitly to the need of increasing visibility of clusters (governance focus group and Varna focus group). The case studies revealed other features that may be highly related to a weak visibility of clusters, such as the lack of cooperative spirit (IDIMAR and Piraeus), the need for wider sectorial partnership (NAPA), or the inadequate definition of clusters by the national regulation (AgroBioFishing).

It remains a challenge for many clusters to **promote themselves internally** (towards their potential business members) in order to:

- Ensure a course of diversification (or multiple specialisation). The example of the Pôle Mer shows that a cluster can play a significant role in the re-qualification of mature activities, and to facilitate the creation of added value along traditional maritime value chains by adding new more innovative maritime economic activities; and

- Generate the necessary critical mass. The example of IDIMAR shows that a cluster can add value if it succeeds in drawing together the forces of a fragmented sector. On the Balearic Islands this initiative is based on coastal and nautical tourism, and IDIMAR has positioned itself to put together those relevant sea-related actors who want to cooperate and work together to develop new products, services and processes to create added value and improve their competitiveness.

For political decision-makers it remains a challenge to demonstrate the important role that clusters can play in boosting Blue Growth. So far very **limited data and performance indicators** of maritime clusters (not only in the Mediterranean but also in other parts of Europe) exist that demonstrate the added value of a maritime cluster in creating economic growth and employment. Indicators and benchmarking are also essential for identifying gaps existing in clusters performance in order to achieve competitive advantages.

Last, but not least, it remains a challenge for the region to **position itself in the European and global markets**.

This study is a first step in increasing the awareness and knowledge on maritime clusters operating in the Mediterranean and the Black Sea among policy makers in the EU. Only if the cluster characteristics, potentials and challenges are known, appropriate means on the European level can be taken to foster Blue Growth by supporting maritime clusters.

4.2.4 *Smart infrastructure and planning*

Maritime clusters require by definition the sharing of infrastructure, including ports, inland infrastructure as well as zoning of activities. Not all maritime economic activities go well, so intelligent and integrated physical and maritime planning are required to facilitate smart infrastructure development.

Potentials

Physical infrastructure is a key factor for cluster competitiveness, especially for those that are directly linked to port activities. Smart infrastructure is an enabler for the development of some sectors of Blue Economy. This implies that infrastructure is not necessarily producing economic growth and jobs in itself, but that it is not possible to produce this growth without having the infrastructure in place.

In Piraeus, the main reason for the limited use of the port as a gateway for transit container traffic was the low competitiveness of the Greek and neighbouring countries' transport networks. In this sense, outdated and poorly maintained infrastructure limits the development potential of cities and territories. Recently, Piraeus has put a lot of emphasis on the level and quality of infrastructure as a way to ensure its growth. Coordinating investments into road, rail and maritime networks, and work towards the harmonization of regional and national regulations were key issues to ensure the efficient delivery of services. This also is the case for NAPA. The current goal of these two clusters is to **integrate port systems in a multimodal transportation network** in order to improve market access, fluidity of trade, and to ensure the integration of activities within an industrial network.

Next to infrastructure, the co-existence of various maritime activities benefiting from the proximity to the sea, and often competing for the same land, can lead to uncoordinated use of coastal and maritime areas, and to an inefficient and unsustainable use of marine and coastal resources⁴⁴. Such tensions call for careful planning of the port and waterfront areas, as well as for integrated coastal management. The necessity to link objectives defined by different actors, and to prevent or alleviate conflicts between

⁴⁴ At the European level, such challenges have been addressed through the Directive establishing a framework for maritime spatial planning and integrated coastal management.

different sectors, should not be seen as an obstacle to development and growth. On the contrary, coherence of management across activities and appropriate cooperation can be a powerful tool to ensure synergies, and eventually growth and jobs. Maritime clusters can contribute actively to such integrated maritime planning.

Challenges

Maritime Spatial Planning and Integrated Coastal Zone Management for the smooth development of maritime activities is urgently needed, and especially so in the Mediterranean and Black Sea areas where such policies and practices are relatively weak.

Infrastructure investment requires financing. More targeted and 'smart' investment towards infrastructure in the two sea-basins, with the aim to increase efficiency throughout the maritime transport chain, remains a key challenge. Within this respect, RailnetEurope provides a positive example of a comprehensive core hinterland rail network for maritime clusters. The first indications for bottlenecks and required capacity have been identified. In the case of NAPA, they include bottlenecks such as short trains, low tonnage limits and low speeds on a number of rail segments.

4.2.5 Trans-boundary cooperation

Another feature of maritime clusters that has emerged through the case studies is the need for internationalisation, and thus trans-boundary cooperation. Maritime actors are used to undertaking activities internationally, and to deal with others with a diverse cultural background. Cross-border cooperation helps to find critical mass, and increases international visibility. But cooperation does not stop there. A next stage is transnational cooperation within the sea-basin. And many clusters expand beyond their sea basins, and engage in wider international cooperation globally.

The case study work has pointed to some good reasons for trans-boundary cooperation of maritime clusters in order to improve their overall performance and competitiveness, both at the level of cluster organisations and that of their members. The following rationale for these various forms of trans-boundary cooperation can be distinguished:

- 1) **Access to markets.** Maritime clusters and their members need to have access to international markets, as products and services are increasingly offered through international platforms to global markets. Cooperation with international partners is important;
- 2) **Jointly address future challenges.** An international approach is required to address challenges in the area of transport infrastructure, environment, spatial planning, enabling technologies, and skills development; and,
- 3) **Benchmarking and learning.** Maritime clusters can learn a lot from other international cluster practices.

Access to markets

Exporting and foreign direct investment are key drivers for economic growth and competitiveness. The need to work with international partners is therefore growing and strategic alliances are key to boosting cluster value. The port of Piraeus shows that the investments of Chinese COSCO have helped to open the port to private firms with appropriate experience and a position in the global market-place. For example, South Korean multinational Samsung is the latest large technology corporation to examine the possibility of forwarding its products to the countries of Central and Eastern Europe through Piraeus port, and Samsung has expressed "strong interest" in talks with China's COSCO.

As already noted, complementarities across value chains offer opportunities for businesses. For example, in the shipbuilding industry, it is noticeable that much manufacturing takes place in Northern Europe, while many of the ships (e.g. cruise ships) are sailing in the Mediterranean. Several cluster

examples (including the Piraeus case) point to opportunities in ship repair and maintenance. Business-to-business cooperation can help to address such opportunities, for example through international exhibits, export promotion, and match making events.

International recognition of the cluster and its potential is key for all market transactions. Northern Adriatic Ports will jointly support and sponsor NAPA to potential markets, to help exploit the full potential of being recognised by international shippers and logistic operators as a valid southern multiport gateway to and from the European market.

The Pôle Mer Méditerranée identifies business partners in southern countries for accompanying European businesses in export projects, missions and reception of foreign delegations. One starting point to do so would be to observe the value chains and identify complementarities.

Market access can also be obtained by cooperation in the area of technology transfer between Europe and its southern neighbours. By doing so, European businesses could ensure their future existence in the medium and long-term.

Such market-based cooperation requires a good knowledge of demand and supply, including its timing. IDIMAR has acknowledged the need to connect and integrate existing maritime value chains to overcome common issues such as the seasonal nature of some activities (for example, yacht maintenance, and ship repairing), and the dependence upon a small number of work providers.

However, many stakeholders have warned that it would not be wise to develop business-to-business cooperation in areas where competition is high. This requires a careful market research, and mapping of opportunities and threats. Doing such market research at cluster level can be a good practice as well, as shown in NAPA.

Jointly address future challenges

Clusters often find common ground by jointly addressing future challenges. Some of these challenges are local, while others are regional, national, and international, and therefore justify such cooperation.

Trans-boundary cooperation should **trigger greater research and training**, a trend already identified but which should be further accelerated and promoted. By enlarging their partnership network, clusters can support the transfer of technology from more innovative to more 'traditional' enterprises, and stress complementarities along the value chain that can create mutual benefits. Geographical targets of collaboration can be those of the Southern EU and Northern Africa countries, as well as among countries of the Black Sea, as mentioned by Marine Cluster Bulgaria's focus group report. Furthermore relevant strategies should also contemplate possibilities of efficient collaboration between Northern EU countries and Southern EU countries, as was raised amongst others by the AgroBioFishing focus group, when possible complementarities create business opportunities. Stakeholders repeatedly highlighted that training, skills and technology development are areas to highlight to focus on when building international cooperation.

Transnational cooperation can focus on a joint approach towards a new European infrastructure policy, including the **mapping of maritime routes**. The port of Varna is not included in major transport corridors which diminishes its competitiveness and economic opportunities. The construction of the Danube Bridge II will shift the traffic further to the west part of the country and it will raise the influence of Sofia and Belgrade as 'transfer poles' and will diminish the passage of goods through the Varna port. To counter such developments, NAPA promotes the improvement of the Baltic-Adriatic corridor, allowing the NAPA ports to become a major European logistic platform for traffic from Far East to Central Europe. In the area of cruise tourism, collaboration between port operators on dedicated routes

can help to balance peaks and troughs on popular destinations, contribute to an improved bargaining position vis-à-vis cruise operators, and increase overall enhanced competitiveness⁴⁵.

Environmental challenges are important for maritime clusters and ports alike. Addressing climate change is one of them, including the need to address sea-level rise. The need is strong to comply with ever higher environmental regulatory requirements (for example, the EC's Birds and Habitats Directives, the Water Framework Directive, and the Marine Strategy Framework Directive), safety and security (for example, the ISPS code). Environmental challenges extend beyond mere compliance and can include achieving significant operational and competitive advantage to achieve energy efficiencies, improved marine and coastal ecosystems, and risk prevention. These environmental benefits can often be better addressed at a sea-basin and cross-border level through research collaboration in waste management, and through alternative energy sources, design and innovation in efficiency, monitoring and environmental compensation, to achieve healthy and balanced marine and coastal ecosystems. International cooperation can help to formulate and find solutions to increase environmental performance in order to operate and compete effectively.

Environmental monitoring is a way to evaluate the impact of ecosystem goods and services on the ecosystem. Economic theory is only beginning to address the valuation of ecosystem services, which although not tradable, are nevertheless crucial. Some progress has been made in this direction through the development of mapping and accounting frameworks for natural capital through European initiatives, such as the Mapping and Assessment of Ecosystems and their Services and the Common International Classification System (CICES). Other initiatives are the European Environment Information and Observation Network (EIONET) and the European Marine Observation and Data Network (EMODnet).

Integrated Maritime Planning can provide a response to many of these challenges, and this is an area where cooperation can be fruitful as well. The French partnership between the key development trajectories and main sectors of the Pôle Mer Méditerranée and the Pôle Mer Bretagne allows the two clusters to establish specific collaboration mechanisms to reach a higher critical mass, to prevent overlaps, and to engage in projects beyond the European level. The cooperation has allowed the spearheading of the Integrated Maritime Policy.

Trans-boundary cluster collaboration can also focus on the promotion of enablers, such as the establishment of a **common framework for data collection** (e.g. EMODnet), to improve the competitiveness of many maritime actors.

Projects and ventures which address common societal challenges can also provide a basis for public (EU) funding. Such trans-boundary cooperation can be enhanced by **increased access to (European) finance programmes**. European Structural Funds (most notably the Territorial Cooperation programmes, but also ESF), Horizon 2020 programmes, as well as TEN-T, all require coordinated approaches. European Territorial Cooperation Operational Programmes represent a positive tool and framework to foster cooperation between countries around the Mediterranean (see for instance the Italy-Malta Operational Programme). As concrete examples, NAPA ports will apply for EU grants to address common environmental challenges at NAPA level, within the framework of the "Europe 2020 Strategy" (for example, the use of alternative fuels and LNG), and the Pôle Mer Méditerranée has appointed a representative in Brussels to facilitate the access to EU R&D programmes, to help the Pôle's members to become leaders or partners in European programmes.

⁴⁵ Ecorys (2013) "Study in support of policy measures for maritime and coastal tourism at EU level", for EC DG MARE

Benchmarking and learning

Benchmarking and learning provide a different rationale for international cluster cooperation. For example, the European cluster collaboration⁴⁶ provides online quality information and networking support for clusters (organisations and members) aiming to improve their performance and increase their competitiveness through the stimulation of trans-national and international cooperation. To this end, the European Secretariat for Cluster Analysis (ECSA) was established by one of the leading German innovation agencies *VDI/VDE Innovation + Technik GmbH* to offer practical advice to cluster management organisations. It builds on the work of the European Cluster Excellence Initiative (ECEI). The European Cluster Collaboration Platform is embedded within the European Cluster Excellence Initiative and financed by the Competitiveness and Innovation Programme, since it is an instrument provided by DG Enterprise and Industry, to enable cluster organisations to actively play a role on the international cluster arena.

More specifically, the European Network of Maritime Clusters already allows for exchange on practices in cooperation, however it focuses rather on national levels than regional clusters. Stakeholders agreed that it is vital to make full use of existing good practice exchanges such as the European Network of Maritime Clusters and funding programmes (INTERREG Transnational and INTERREG Europe programmes). For Varna, the most significant benefits from the participation in the ENMC is access to quality information. Their membership of the network gave an opportunity to establish contacts with similar organisations, to see how these are situated within the economic and legislative framework of their respective countries, how they are working, how other members deal with national and local authorities, and to understand how they build relations within their cluster.

Membership of national cluster organisations can be important too. The Pôle Mer Méditerranée has been within the first round of French clusters support (2005). The Automotive Cluster Slovenia, formed in 2000 and presented at the Koper Focus Group, has been a recognised example of good practice (Best Cluster Management EU Award, 2006) and is used as the comparator model. The Marine Cluster Bulgaria is member of the Association of Business Clusters in Bulgaria, the Bulgarian Industrial Capital Association and the European Network of Maritime Clusters (ENMC), and the participation within the ENMC allowed companies within this cluster to establish business relations and contacts with firms from other clusters and to explore possibilities for trade activities. The Marine Cluster Bulgaria has very good working relations and cooperation with the members of the Associations of Business Clusters in Bulgaria. They are partnering and sharing lessons learned and good practices. Together with other members, they Cluster has initiated strategic relations with the Ministry of Economy and Energy and is regularly consulted for future initiatives and developments in the field of cluster policy and cluster support. And IDIMAR used good practices developed by top firms in the hotel and accommodation sector: World class Balearic companies such as Iberostar, Meliá and Barceló can be considered top references for leisure and luxury hotels. These companies have been in business for the last 50 years and some aspects of their know how, lessons learnt and good practices could be applied to the cluster in what respects environmental policy, luxury services and efficient human resources management.

4.2.6 Professional cluster management

Bringing about the above synergies requires professional cluster management, time and dedicated efforts by a skilled support staff. And yet, as the figure below illustrates, potentials and challenges for development vary through the different stages of existence of a cluster, depending on the degree of heterogeneity of knowledge and their size (number of employees).

⁴⁶ [Http://www.clustercollaboration.eu](http://www.clustercollaboration.eu).

Effective leadership is essential for a healthy cluster organisation. And yet, there are different views regarding the leadership of the cluster. Most of the clusters visited are driven by private actors, or are convinced that private sector must have the lead (the case of Piraeus, AgroBioFishing), since they see enterprises as the generators of innovation and jobs. While this is unquestionable, there is also a risk of dominance by just one private sector player, which could lead to negative externalities or abuse of the public interest. Nevertheless, some debate also emerged on the need for some public support from national or regional authorities at the emerging stage.

Although in principle it is understood that public interventions can play a decisive role in sustaining the cluster start-up, in practice it is not easy to understand when the public hand should leave room to a full private ownership. For instance the creation of IDIMAR was a private response to the Science and Technology plan of the Balearic Government. Pôle Mer Méditerranée was the outcome of a public tender under the 2005 Finance Act, and at the initial phase of AgroBioFishing cluster the Sicilian region had a pivotal role. Examples also point to successful public leadership of clusters, as mentioned during the governance focus group, while others failed. Thus, in conclusion, the degree of public involvement depends on the stage of the clusters life cycle and neither public nor private leadership are a guarantee for success *per se*.

Apart from who is going to be the leader, there are two essential elements for a successful performance of a cluster. Firstly, the existence of high professional managers with specialist skills (as stressed in most of the focus groups, Marine Cluster Bulgaria, Piraeus, Pôle Mer Méditerranée, NAPA). Secondly, the elaboration of accurate action plans for the development of the cluster (as highlighted in NAPA focus group and mentioned during discussion in Piraeus).

All of the cluster organisations under consideration are recently established, the oldest one going back to 2005⁴⁷. An urgent need for 'guidance', through the **dissemination of existing knowledge on how to develop maritime clusters** was therefore apparent during all local discussions and, as pointed out in the NAPA focus group, "*we don't have to reinvent the wheel*". Best practices (and negative ones which are also educative) do exist, both from older maritime clusters and from other industrial clusters.

Within this context it is important for cluster managers to make full use of **existing cluster networks and tools**, including:

- The *European Network of Maritime Clusters* (ENMC) is a confederation of Clusters or equivalent structures. It has to be understood as a best practices dissemination and exchange platform through the website, informal talks and an annual summit during which each country gives a brief presentation of the economic situation of its maritime sector and the recent actions of its national organization. The ENMC is particularly useful for exchanges with national governments (www.enmc.eu);
- The *Cluster Observatory* is an online, free and user-friendly platform that provides a single access point to data and analysis of clusters, cluster organizations and regional microeconomic framework conditions in Europe. Furthermore it provides a cluster library, and a classroom for cluster education. The Cluster Observatory also produces reports on clusters and regional competitiveness conditions. Its staff also offers cluster benchmarking, cluster programme evaluation and coaching of cluster organisation management on a fee basis. In 2012 the Cluster Observatory was separated from the European Cluster Observatory (hosted at DG Enterprise and Industry), and is now run privately by CSC in Stockholm (www.clusterobservatory.eu);
- The *European Cluster Collaboration Platform* provides online quality information and networking support for clusters (organisations and members) aiming to improve their performance and increase their competitiveness through the stimulation of trans-national and international

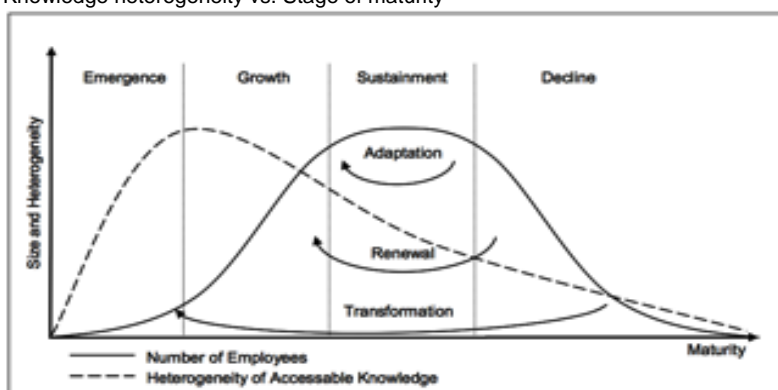
⁴⁷ Though Piraeus cluster has been created some decades ago, it has no cluster organisation.

cooperation. This new online portal rich in features and information has been developed aiming to build communication bridges between cluster players from the same or a different sector. The ultimate goal is to facilitate cluster cooperation, both between cluster organisations, as well as between cluster members (i.e. companies, R&D institutions, other players) (www.clustercollaboration.eu);

- The *European Cluster Managers' Club* (ECMC) is an association of individuals for European cluster managers and practitioners. It is a place where cluster managers can share and analyse cluster management problems with peers, have easy access to all existing high quality services and tools to improve everyday cluster management and exchange views, experiences and best practices and thus get prepared to tackle new challenges. The club is open to those who have published a profile on the Cluster Collaboration portal and who have taken part in cluster management excellence schemes (www.cluster-excellence.eu);
- *European Cluster Excellence Initiative (ECEI)*. The European Secretariat for Cluster Analysis (ESCA) promotes cluster management excellence through benchmarking and quality labelling of clusters and cluster management organisations. The ECEI has mandated ESCA to organise an assessment process of clusters and develop a database of all clusters that have been benchmarked since November 2010. The interview covers 36 indicators with regard to the structure of the cluster, the cluster management and the governance of the cluster, financing of the cluster management, services provided by the cluster management, contacts and interaction within the cluster and achievements and recognition of the cluster. Results are presented by an individual report to the cluster management and include also recommendations for further improvement in line with the requirements of the cluster quality label that is currently developed by the European Cluster Excellence Initiative. The list includes 570 clusters from 35 countries (ECEI, www.cluster-excellence.eu/quality.html); and
- *European Territorial Cooperation programmes*. A new round of European Territorial Cooperation programmes is about to be started, including both Transnational and INTERREG Europe programmes, both offering opportunities to promote international cluster co-operation (www.interreg4c.eu/interreg-europe).

The support needed by clusters from a management perspective also varies according to the cluster life cycle (Fig. 4.2).

Figure 4.2 Knowledge heterogeneity vs. Stage of maturity



Source: Max Plank Institute of Economics (2007)⁴⁸

Emerging Maritime Clusters need basic operational, financial and marketing skills and the ability to engage with a variety of small-medium companies to create consensus and support. They must manage a large amount of heterogeneous knowledge and channel it across members and prospect

⁴⁸ Cluster life cycles: dimensions and rationales of cluster development (p. 19) www.econstor.eu/bitstream/10419/25650/1/553691740.PDF.

companies. They also maximize the cluster visibility by exploiting available opportunities at the local but even more at the international level, so as to access broader endorsement and access possible international funds.

Growing Maritime Clusters require advanced managerial skills to identify new development opportunities, so as to sustain clusters growth, and access innovation techniques and practices which may add value to their associates. Managers of a growing cluster should also develop strong 'soft leadership' skills, to promote cooperation by identifying areas of possible cooperation among associates, and to avoid conflicts amongst those enterprises which are potentially competitors in a same economic activity (or are looking for greater diversification in competing economic areas).

Mature Maritime Clusters require sophisticated strategic management skills so to identify opportunities for the re-definition of their core-business, and sustain an enduring growth and avoid risks of 'decline'. The main challenge for their managers is therefore the ability to access high-quality global innovation and have the managerial capacity to lead strategic change. Even more than growing clusters, they need the 'soft-skills' necessary to lead change within complex organisational environments. Leadership should be exercised both at the political and managerial level, as they coordinate large companies with strong political interests.

Potentials

Successful management of a maritime cluster may have relevant positive externalities for the maritime economy of an entire country or macro-region. Members of the Marine Cluster Bulgaria employed 2,882 people in 2012, representing 19.98% of the total employed workforce in the whole maritime industry of the country. The cluster as a whole has a turnover of approximately €160 million for 2011 which represents a substantial part (35.72%) of the overall turnover in the maritime industry for 2011, amounting to over 873 million BGN (over €448 million). The Piraeus⁴ cluster involves about 2,900 enterprises, resulting in estimated 37,700 direct jobs in the private sector and up to 10,000 jobs in the public sector (by including employees of the Ministry of Merchant Marine and Coast Guard, the Port Authority of Piraeus, the Greek shipping register and the General Directorate of Fisheries). The NAPA cluster is strategically positioned at the main corridors of the TEN-T "Core Network": the Scandinavia – Mediterranean, the Mediterranean, and the Adriatic–Baltic, providing links to 500 million European consumers and large commercial and industrial inland hubs.

These are relevant figures when it comes to the maritime sector in large EU Member States (or cross-border regions), and even more important as they refer to countries and regions strongly in need for innovation and policy support to face a fierce global competition.

Proper cluster management can also raise standards in the performance of maritime actors across the sea-basin, beyond the individual members of the cluster. One of the strategic objectives of the Pôle Mer Méditerranée, for example, is to enhance the training activities available on its territory and to ensure their alignment with the actual needs of its member enterprises. The Pôle actively collaborates with the regional schools and institutes, and creates linkages between its businesses and SMEs and the local education and training institutions. Also, the cluster aims to strengthen its presence in the Mediterranean area, notably by deepening relations with the Maghreb countries, Egypt and Turkey. The focus group held in La Seyne-sur-Mer with training and business participants from Morocco has been an occasion to reinforce the idea that countries in the Mediterranean area share the same interest in innovative projects on common issues such as maritime security and environmental protection.

Supporting good practices in maritime cluster management is therefore helping to spread businesses innovation across MEA value chains, and is a driver for achieving the EU Blue Growth Strategy. Such

potentials should be fully recognised by policy makers and key stakeholders, both at the local and the national level, as essential pillars of regional and national strategies for sectoral development.

Challenges

A careful balance needs to be struck between critical mass and identity and coherence, because those clusters emerging successfully from an early stage with a solid critical mass may be confronted in their growth with issues of leadership and power relations amongst members. This may be affecting the very identity and coherence of the cluster management organisation, which after the initial emerging phase now requires more formal agreements and structure.

A key aspect of the NAPA cluster is that it does not operate a central secretariat and divides tasks between members according to skills and capacity, using existing staff. This pragmatic approach has enabled the cluster to develop quickly in their priority areas in the relatively short time since it was formed. Currently, the cluster operates a rotating presidency, with a governing General Assembly meeting annually and its management is funded within existing port budgets, and by a pooling of existing resources. However, a challenge is seen in the substantial lack of centralised organisational structure to provide a single point of access, project management and coordination, and then give more stability to the cluster as an independent organisation. Although NAPA has a very clear vision and strategy and an action plan, it still lacks an official business plan specifying in detail how this is to be achieved. The transition of statutory ports into the private sector through sector reform is recognised as an issue, which may affect the stability of the growing cluster.

Effective management of a cluster requires performance monitoring systems to be in place, to assess and benchmark the achievement of the cluster with possible competitors. Also, as stressed above, a cluster needs to put in place marketing and visibility actions. This is particularly a challenge for the clusters in the region, as there is no established practice on how to identify and measure ongoing results of a cluster. It is not evident to cluster managers how to define key performance indicators, as the parameters of functioning of a cluster as complex and multi-criteria indicators should be considered: for example, increasing knowledge, exchange good practice, promote innovation and new initiatives, achieve critical mass in employment, and Gross Value Added of member companies. Furthermore, a lack of reliable and comparable data for the sector in many countries across the Mediterranean and Black Sea basins prevents reliable performance monitoring or benchmarking for each maritime cluster and across the EU maritime sector. Growing clusters may struggle to properly monitor and assess their performance, and they need support from the national and EU level in order to improve data availability as well as their monitoring ability. This is the case, for example, of IDIMAR in Spain and the Maritime Cluster in Bulgaria.

In Spain, the Balearic Islands are a top reference destination in terms of nautical and sailing activities. But in order to size and analyse the performance of the sector, there is an important challenge to provide quantitative data. There is a substantial lack of updated data on the actual figures of the sector on basic indicators such as: the Gross Domestic Product that the nautical sector represents to the region, the number of firms working in the sector, the number of employees, or the associations that exist. This lack of objective verifiable data represents a real challenge for any future effort to make in order to monitor growth and performance of the sector and the IDIMAR cluster within it. Initiatives in support of cluster managers are not clearly in place, and clusters managers are struggling to identify which key indicators and data-sources are important as a baseline to assess maritime clusters performances.

Similarly, in Bulgaria the management of the Maritime Cluster is struggling to identify adequate key performance indicators, a situation aggravated by the overall lack of official statistics and analysis for the maritime sector in the country. Maritime clusters are not well recognised and developed by national

policies as strong economic factors for innovation and in practice there is no common understanding on what a cluster is. There is no cluster definition, no proper criteria for the funding of the clusters in different stages of their development, nor on the indicators to be used to monitor progress on cluster performance. It is a struggle for maritime clusters managers to properly collect micro- and macro-economic data to assess their performance and achievements through time. With this respect a support from national or EU policy is welcome, as a means to promote greater skills in cluster performance monitoring and availability of macro-economic data to place clusters performance within a broader regional context.

In this context, **setting the target of achieving a critical mass in the emerging phase** is important. In the analysis of existing maritime clusters in this study, it has emerged as a minimum of 50 companies, which are diversified in size, is essential to ensure the prosperity of the cluster after an initial emerging phase. And yet experience and discussion with cluster managers shows the importance of assuring the presence of some large companies amongst the cluster members, to provide enough financial support for the cluster to develop after the initial start-up.

Similarly, cluster managers should also **support the re-definition of the core business in mature clusters**. Mature maritime clusters also face specific challenges, as they need to sustain a large number of associates and employers, so as to retain and enhance the market position acquired through time. They are therefore confronted with the risk of lacking competitiveness in case of the declining market position of their lead members. Managers of mature clusters should therefore identify opportunities that allow a constant re-definition of the core-business of their members, and define paths of diversification without losing trust of their powerful members. Instead of facing decline when it is too late, managers of mature maritime clusters should constantly anticipate challenges and assess possible micro-innovations strategies to keep renewing their value proposition, and provide chances for their associates to experiment new opportunities to further expand their business.

5 Roadmap for policy makers

5.1 The policy ambition: when to support maritime clusters (and when not)

Maritime clusters can be an important instrument to bring innovation, growth and jobs to the Mediterranean and Black Sea regions. Our estimates show that at least one of three jobs in the Blue Economy in the Mediterranean and Black Sea is already located in such clusters. Many regions in these sea-basins are currently reinventing their economic development strategies after a long economic, financial, public sector and social crisis. Many actors in the region are now more aware than ever that such development needs to come from competitive advantage built on unique selling propositions. Maritime clusters can provide a boost to such economic benefits, first and foremost by providing synergies and externalities that lead to increased productivity and increased competitiveness.

Building and developing successful maritime clusters is however complex. It requires a large number of actors to cooperate, both public and private. It requires a good policy framework, critical mass, a willingness to work together and to trust, good management and leadership, and a clear view on the opportunities and challenges ahead and how to address these.

There is much experience in building and developing clusters from Europe as well as from around the world (including maritime clusters), and it is crucial to learn from these experiences and take account of existing support structures when working towards the above ambition. Clearly, there is no need to 'reinvent the wheel'.

However, there are no standard recipes for building and managing maritime clusters in the Mediterranean and Black Sea regions. Situations are very different, and care should be taken in copying standard practices from very different situations. Equally, it is important to recognise that not all maritime clusters can be 'world class', as many will be successful at a lower geographical scale: the sea-basin, national or regional level⁴⁹.

Maritime clusters cannot prosper in isolation, and a set of prerequisites for their successful development can be identified. They need to have a certain critical size to prosper, and to be managed in a professional way. They also need to be embedded in local, regional, national and sea-basin specific strategies and policies.

We now provide specific recommendations and guidance on what policy makers can do to support maritime clusters in these regions and countries. We address policy makers at all levels, starting from EU level, but also at the national, regional and local levels.

1. Recognise emerging maritime clusters and support their start-up

National and regional policy makers need to fully map and identify relevant local maritime clusters, and put in place instruments and tools to support their emerging phase, through dedicated funding and tools that improve the visibility of such clusters locally and internationally. They should do so in ways that provide incentives to clusters to gather additional private funding, and extend their membership to become self-sustainable after the initial start-up and in their growing phase. At the EU level, this implies integrating and streamlining maritime clusters in existing mapping activities (for example, the Cluster Observatory by DG Enterprise⁵⁰) as well as identifying the best ways to support emerging maritime

⁴⁹ See EC Communication "Towards world-class clusters in the European Union", COM(2008)652 final.

⁵⁰ <http://www.clusterobservatory.eu/index.html>.

clusters through the existing EU funds (e.g. Structural funds, Horizon 2020). At the national and local levels this would mean initiating or strengthening specific policies aimed at supporting maritime clusters through dedicated resources and opportunities for greater visibility.

2. Agree on performance targets for clusters in an early stage

Cluster managers and policy makers need to agree on the conditionality of support: how many members will be required by when; how many start-up companies or jobs are aimed for; what other success indicators can be applied, such as export performance, increased visibility, competence development and trans-boundary cooperation; and, what will be the extent to which costs are covered? There is certainly a justification for longer term cluster support, as long as benefits exceed costs for the members directly involved. But this argument can never be used for writing a 'blank cheque' for longer periods of time. Instead, agreements about co-financing rates in a longer time frame make much sense.

3. Promote “champions” without neglecting promising new clusters

The analysis of existing maritime clusters across their life cycle shows that mature clusters tend to aggregate large amounts of small-to-micro enterprises, therefore generating high employment locally. As a consequence, policy makers may be tempted to focus their support on such large 'champions'. It is important to recognise that public resources should be also allocated to support emerging clusters, so that they can achieve a critical mass and become self-sufficient. New and emerging clusters have in fact a great potential when it comes to promoting innovation and diversification of the Blue Economy, especially so in the Mediterranean and Black Sea regions.

5.2 Policy actions: How to support maritime clusters

The Roadmap for policy makers is organised according to seven action lines:

- Action line 1: Foster an effective policy framework;
- Action line 2: Enable competency development and knowledge sharing;
- Action line 3: Engage clusters in Maritime Spatial Planning;
- Action line 3: Embrace maritime clusters as part of Smart Specialisation;
- Action line 5: Promote marketing and visibility of maritime clusters;
- Action line 6: Stimulate trans-boundary cooperation; and
- Action line 7: Enhance good maritime cluster management (enabler).

5.2.1 Action line 1: Foster an effective policy framework

Maritime clusters cannot prosper in isolation and they need to be embedded in local, regional, national and sea-basin specific strategies and policies. It helps much when they are part of formal and powerful cluster concepts, as the “pôles de compétitivité” in France. Absence of such frameworks and policies hinders the development of a cluster, as can be seen in the case of the Marine Cluster Bulgaria, which suffers from a limited coordination at national level and a weak recognition of the importance of the Blue Economy by the main policy and economic actors.

A coherent macro- and meso-policy framework is vital for the development of maritime clusters as well. Macro-economic conditions are clearly not favourable in these sea-basins, and any progress in these conditions will favour all businesses, irrespective of their nature. The subsequent public sector budget cuts have put a range of public functions under threat, and can lead to further deteriorating framework conditions. A lack of such framework is seen as a main obstacle for maritime clusters development and, thus, for the related enhancement of economic activities.

It is important that governance levels are aligned and that efforts are made towards multi-level governance. This need can be illustrated by the case of IDIMAR, where the sector suffers from a complex and to a certain extent unclear legislative environment. Thus, in order to certify its nautical and sailing products and services, a company needs to comply with legal requirements coming from different tiers of government: the EU level, the central government (including the National Merchant Navy Institution, the Customs Agency and the Finance Ministry), the regional government, the Consell Insular (Mallorca's island government) and the City Council. This situation makes the legal framework sometimes difficult to understand, makes the sector more bureaucratic and limits its flexibility, and therefore reduces the competitiveness of the local companies operating in the sector in contrast with others. Such a complex institutional setting may also discourage foreign companies and potential investors to bring resources and establish themselves in the region. The navigation and mooring of boats, as well as international sailing and nautical events in the regions, might be adversely affected too.

Policies need to take into account sub-regional specificities. Pôle Mer Méditerranée mentioned the need for a West Mediterranean sea-basin strategy including a free zone among EU and non-EU members, AgroBioFishing stressed the need for Central Mediterranean policy especially between EU and non-EU actors, IDIMAR pinpointed the higher weight attached by the European Blue Agenda to traditional maritime sectors led by northern European countries, and Piraeus expressed concerns that European policies do not always take into account national specificities.

Relevant aspects and measures to be taken into account by policy makers would be the following:

1. Every policy level needs to play its own role

Maritime cluster development touches upon a range of government policies, ranging from transport, economic policy, environmental policy and physical planning all the way to skills development, education, employment and safety regulations. Across the Mediterranean and Black Sea regions, government competencies vary a lot. Gaps in policy making have been observed, and it is important to recognise these and address them. Maritime clusters can be hampered by such gaps, also when multiple government levels and sectors are not fully aligned.

Within this context, it is good for policy makers to exploit the *European Network of Maritime Clusters (ENMC)* - a confederation of clusters or equivalent structures.

2. Maritime clusters can be a powerful resource for policy makers

Maritime clusters provide a unique platform for business, education, research and government to meet and exchange. Well-functioning clusters have clear views on the longer term needs of their members and partners, and have engaged in 'horizon scanning' and are therefore an important resource when preparing policy, whether in the area of skills, transport, environment or physical planning. Policy makers at all levels are therefore encouraged to engage with maritime clusters and to understand to their needs and interests.

Within this context, the *Cluster Observatory* can be an informative tool for policy makers as it produces reports on clusters and regional competitiveness conditions.

3. Acknowledge maritime clusters in implementing existing (funding) initiatives

Take specificities of maritime clusters into account when implementing existing (funding) initiatives. Many of the maritime clusters identified are functioning through informal exchange and cooperation. This may be fine for small-scale and *ad hoc* actions, but accessing international funding opportunities (e.g. Horizon 2020, Structural Funds including IPA, ENPI, and COSME) requires a more formal setting. Participants to the governance focus group raised however the fact that it is often difficult for clusters to

participate in the related programmes due to their legal status; as a private entity needs to comply with *de minimis* rules. For example, clusters are part of block exemptions set by the European Commission Directorate General for Competition provided public funding is limited to 30-50 % of support measures for a duration of 10 years.

4. Sea-basin strategies as a lever for promoting maritime focus of policy makers

Macro-regional as well as sea-basin strategies have the potential to steer EU funding by setting themes and priorities (for example, the current Horizon 2020 calls have been influenced by the Atlantic Action Plan). The Baltic Sea experience (the EUSBSR) has been positive and pioneering for stakeholders, and the more recent experience in the Adriatic-Ionian region (EUSAIR) has been positive as well. Such guidance was felt to be missing by representatives from the Western Mediterranean and Black Sea. In NAPA, inter-ministerial technical meetings will be held in 2014 regarding future cooperation activity between Slovenia, Italy and Croatia. Key areas for discussion include transportation, energy and ports. Support for NAPA will play a key role in the discussion. These meetings are seen by NAPA as an important response by governments to create an 'enabling environment' for their development.

The development of the Adriatic-Ionian sea-basin strategy has demonstrated that sea-basin strategies can foster the awareness of the maritime economy amongst national (and regional) policy makers. Such international strategies will help maritime clusters to be acknowledged and recognised. They will be seen as part of a larger network rather than an isolated group of companies and institutes.

5. Engage financial institutions

Financial institutions (both public and private) are well-placed to support maritime clusters, and it is important to take into account their assessments and views when it comes to building up clusters. Investors and financial institutions are well-placed to provide a 'reality check' on cluster activities which will be feasible and therefore sustainable, and those which are not. Financial institutions are also needed to explore potential for public private partnership, for example through Connecting Europe Facility (CEF)⁵¹. Maritime clusters may act as a catalyst for further funding from the private and public sector. The Project Bond initiative is designed by CEF to enable eligible projects promoters, usually public private partnerships (PPP), to attract additional private finance from institutional investors⁵².

5.2.2 Action line 2: Enable competency development and knowledge sharing

A low-cost and low-wage strategy is not promising in the medium- and long-term, as large enterprises attracted by low cost may delocalise sooner or later to other low-cost countries. Maritime clusters can attract big investors if they can provide a suitable and stable business environment. Good qualifications and skills are an indispensable element of such an environment. Skills and competences can be the hook for a big company to engage in a cluster and thus ensure the sustainability of it. Having available education and training facilities can be an asset for a maritime cluster.

In the Mediterranean and Black Sea regions, maritime clusters tend to focus on rather traditional maritime economic activities (MEAs). The identification of competency and knowledge gaps that prevent clusters to address future trends constitutes a major challenge for the region. Also, the development of the technical and economic competencies on an international level are of absolute necessity for the further development of maritime clusters and their potential to create economic growth and employment. This is the case whether a maritime cluster wants to become "world class", "national champion" or just wants to improve the regional competitiveness. Still, the image of many maritime

⁵¹ See: <http://inea.ec.europa.eu/en/cef/cef.htm>.

⁵² See: <http://www.eib.org/products/project-bonds/index.htm>.

professions is poor. Even if wages are good it is often difficult to attract skilled and qualified people to the maritime sector.

Relevant aspects and measures to be taken into account by policy makers would be the following:

1. Launch specific calls addressing the competency and knowledge gaps in the region

DG MARE has succeeded in introducing Blue Growth as a single category in EU research programmes, in EU programmes dealing with Territorial Cooperation (INTERREG), and in programmes dealing with non-EU countries (IPA or ENPI). In these programmes, specific calls for proposals could be launched to identify and elaborate adequate means to close the competency and knowledge gaps that prevent clusters to address future trends in the Mediterranean and Black Sea. The projects should deal only with a reasonable set of MEAs. Depending on the outcome of the projects, it could be worthwhile to ensure that Blue Growth is entrenched in EU programmes dealing with education, training and research qualification (such as ERASMUS, Marie Curie, national qualification campaigns financed from ESF, twinning initiatives), helping to address the need for highly specialised (engineering) skills in some emerging MEAs.

2. Create a mobility programme for maritime clusters

For maritime clusters it is important to find the right balance between in-depth knowledge of the local and regional specificities and the wider global context. Inspired by the success of the ERASMUS programme, a similar initiative for cluster managers could be envisaged. An exchange programme for mobility of researchers could be valuable as well. For this the renamed Marie Skłodowska-Curie actions (MSCA) could provide a good platform. Next to the promotion of mobility between countries, the MSCA also seek to break the real and perceived barriers between academic and other sectors, especially business. This would allow individuals (primarily applied researchers) from a cluster to get fresh ideas, either from a maritime cluster in a different EU sea basin or from a different field altogether. It is important to explicitly include the staff of education and training facilities in the programme. Here the pillar “supporting entrepreneurs” from the COSME programme could provide the right platform to initiate such an exchange⁵³.

3. Strengthen and utilise the framework for training institutions for exchange with non-EU countries

The MSCA programme is open for participation to all countries of the region (ENPI/MEDA). The MSCA support to research training and career development focuses on innovation skills and funds worldwide and cross-sector mobility that implements excellent research in any field. MSCA grants exist for all stages of a researcher's career, from doctoral candidates to highly experienced researchers, and encourage transnational, intersectoral and interdisciplinary mobility. The MSCA will become the main EU programme for doctoral training as well. In addition to fostering mobility between countries, the MSCA also seeks to break the real and perceived barriers between academic and other sectors, especially business.

The COSME⁵⁴ initiative is relevant in this context. One upcoming set of initiatives⁵⁵ within the COSME scheme is the one labelled “clusters go international”⁵⁶ and related CIP initiatives⁵⁷ aimed at supporting EU clusters in transnational partnerships, cluster benchmarking, and large-scale demonstrators⁵⁸. Initiatives will be open to non-EU countries (ENPI/MEDA) to be listed once official information is

⁵³ More information can be obtained from the Executive Agency for Small and Medium-sized Enterprises (EASME - <http://ec.europa.eu/easme/>).

⁵⁴ http://ec.europa.eu/enterprise/initiatives/cosme/index_en.htm.

⁵⁵ <http://www.eurada.org/files/AG13plus/Carsten%20SCHIERENBECK.pdf>.

⁵⁶ Discussed during internal meeting with DG Mare and DG Enterprise.

⁵⁷ http://www.cluster-analysis.org/downloads/Announcement_ClusterExcellenceWorkshop.pdf.

⁵⁸ Official details not yet available.

available.

4. Stimulate a gap analysis on competences as well as available training / education facilities

In day-to-day business, enterprises often do not have the possibility to look beyond their current market and to spot the future trends in the maritime field. Maritime clusters can and should be a platform that forces and supports its members to think about the future ('horizon scanning'). The identification of future trends must be put in relation to the current core MEAs, the available skills and the existing education and training facilities of the cluster.

Such 'horizon scanning' provides foresight into the maritime business world of the future. A gap analysis on competences can provide the answer on 'what do we need in order to move from a traditional MEA to an emerging MEA?'. It is crucial to include not only the current skills in the analysis but also the education and training facilities that exist in the cluster: for example, the types of training programmes that exist, how do the curricula look like, and what profile the trainers, researchers and teachers have. The findings of the analysis need to be transformed into an action plan on how to address the identified gaps. Many clusters already engage in such activities, but much more can be done and public policy at all levels has a role to play to stimulate such work.

5.2.3 Action line 3: Engage clusters in Maritime Spatial Planning

The operation of maritime sectors is interlinked with competing economic activities as well as the maritime environment. The increasing use of the Europe's seas and oceans can lead to tensions and competition for maritime space, and put pressure on the marine environment. Marine spatial planning is a common denominator for maritime clusters, as spatial planning along with functioning ecosystems are a prerequisite for the long-term sustainable development of the maritime clusters. As activities at sea or near shore may conflict mutually or with environmental objectives, spatial planning is needed to reduce such conflicts and the potential impact.

The EU has set up various policies in this field and a framework for Maritime spatial planning has been established.⁵⁹ It will require Member States to develop and implement coherent processes to plan human uses of maritime space and to develop cross-sectoral maritime spatial plans by 2021. These plans should apply the ecosystem-based approach, contribute to the preservation, protection and improvement of the environment, contributing to the sustainable development of energy sectors at sea, maritime transport and fisheries and aquaculture, and allow Member States to pursue additional objectives such as sustainable tourism or the extraction of raw materials. They should also take into account land-sea interactions and promote the coherence with Integrated Coastal Zone Management. Economic activities also need to take account of the Marine Strategy Framework Directive⁶⁰.

The workshop in Brussels highlighted the importance of Maritime Spatial Planning and the relevance of maritime clusters as both generators and victims of environmental degradation. Though Member States are proceeding to implement these two Directives, past examples have shown that partnership-based approaches help to make progress.

1. Engage maritime clusters in Maritime Spatial Planning

The preparation of cross-sectoral maritime spatial plans by 2021 will encourage Member States to better think about the future use of maritime space. It will require them to think about synergies and spatial tensions between maritime activities and the environment, some of them already present but others yet to occur. They will need to take account of the dynamics of maritime economic activities,

⁵⁹ COM (2013) 133 "Proposal for a directive of the EP and of the Council establishing a framework for maritime spatial planning and integrated coastal management".

⁶⁰ Marine Strategy Framework Directive, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056>.

including the space needed for renewable energy (e.g. offshore wind parks, ocean energy) as well as evolutions in maritime transport (e.g. LNG-propelled vessels and their impacts on ports), tourism, fisheries and aquaculture. Maritime clusters are well-placed to engage as partners in Maritime Spatial Planning. They will be able to provide a wealth of information on future space needs. At the same time, such exchange is an opportunity to strengthen consciousness of economic actors about the need for an ecosystem-based approach. After all, many such economic activities are dependent on a clean and healthy marine environment.

2. Promote partnership in Integrated Coastal Zone Management

The Mediterranean and Black Sea suffer to a relatively high degree from fragmented coast lines, environmental pollution, congestion and visual pollution. Integrated coastal management can be a powerful tool to improve the attractiveness and quality of the coastline. An integrated approach requires partnership in which a consensus emerges about future challenges and opportunities, including those in the area of climate change, awareness of environmental issues, coastal erosion, and natural disasters. There are a variety of ways to build such engagement and partnership, depending on the geographic context⁶¹. Maritime clusters are natural partners to engage in all initiatives regarding Integrated Coastal Zone Management, but it is primarily up to local and regional governments to reach out to them.

5.2.4 Action line 4: Embrace maritime clusters as part of Smart Specialisation

Smart Specialisation strategies, as currently implemented under the Atlantic Action Plan, help much in the positioning of maritime clusters. They provide a sense of direction on where unique selling propositions and competitive advantages lie, and where to focus on. Across the sea-basins several representatives from maritime clusters (e.g. from Cyprus) expressed their disappointment about the fact that they had not actively been consulted in the preparation of new European Structural and Investment (ESI) programmes, and that maritime cluster activities had not been taken fully into account in the programming round 2014-2020. Such a strategy was felt to be missing altogether in Bulgaria, where the national framework for maritime policy is not yet strongly developed. A similar absence was felt in the Balears.

Smart Specialisation strategies need to be firmly linked to investment and planning. Land use policies have a recognised influence on cluster development, and in the best cases, planning has supported and facilitated cluster growth for strategic reasons. However, too often the planning system has not offered the support envisaged. The planning system can also be valuable in cluster development as it preserves amenity values and alleviates congestion. National policy makers should be aware that the regional dimension of planning and the interlinkage with regional economic development is important.

Relevant aspects and measures to be taken into account by policy makers could be:

1. Build on Maritime clusters when rolling out Smart Specialisation Strategies

Recently, Member State governments together with regions have developed the key priorities for economic and social development in the context of the new European Structural and Investment (ESI) programmes. Several of these include 'Smart Specialisation Strategies' and cover maritime clusters. However others have not done so explicitly, and it is important to take account of such clusters when further refining and implementing such strategies.

⁶¹ OURCOAST initiative (2010) "*Integrated Coastal Zone Management: Participation practices in Europe*". EC DG Environment.

2. Ensure a coordinated role for quality hinterland-port connections

EU and Member States should strengthen the alignment of transport projects with the TEN-T, giving priority to projects on port access and hinterland connections. This should use all the available financial instruments apart from Structural and Cohesion Funds, such as loans made available through the European Investment Bank and other EU lending facilities. Similarly, it will be important to ensure the alignment of maritime clusters with the proposals of Trans-European Transport Networks. This is particularly the case for southern European ports, which need improved support infrastructure, specifically concerning rail links connecting them to the main European rail network. This is one of the key recommendations of Xavier Solana's "Mediterranean Reborn" article. Improved support infrastructure is one of the key elements to achieve the rebalance, that is to say the "*redirection of port traffic to the southern European ports*"⁶². The Trans-European Transport (TEN-T) policy, which the EU is currently revising, is fundamental in this respect, because it is the master plan that will guide the development of the basic European infrastructures.

Although this infrastructure is financed mainly by individual EU member states using their own funds, the TEN-T is binding and marks out the priority projects for each member. Thus, it is absolutely essential for TEN-T to reflect the importance of rail connections for the southern European ports.

This planning should consider the adequacy of existing facilities and ensure the availability of sites and premises for potential investors and for the expansion of existing businesses. It can be coupled by the necessary rescheduling and reengineering of flows in order to avoid conflicts and congestions.

3. Encourage 'flexible' infrastructure investments

Planning of infrastructure must take into consideration the versatility of its use and make the best out of it, as infrastructure investments are quite costly and cost effectiveness must be ensured. This means that infrastructure planning must take into account the possibility of a 'plan B' in the case that the main purpose will be altered. For example when a building is planned, the design should allow multiple utilisation, and a cruise terminal could be also used as an exhibition hall. So an important step is to rethink the size and composition of the infrastructure and embrace the notion that maritime infrastructures should be positioned as part of a broader urban agenda. Policy makers need to encourage such thinking amongst economic actors.

5.2.5 Action line 5: Promote marketing and visibility of maritime clusters

The cluster concept is still poorly known amongst many entrepreneurs, policy makers and even researchers in the Mediterranean and the Black Sea. In some countries there is also a different understanding of the term 'cluster', which is rather referring to nation-wide action plans rather than to 'a geographic proximate group' as defined in this Study. Still, local and regional stakeholders need to be aware of and to support the cluster concept in order to make it an effective means to fuel Blue Growth. But also beyond the immediate local and regional context, an increased visibility of maritime clusters is necessary to exploit a number of potentials, such as attracting skilled people, investments, venture capital, and promoting the establishment of new firms. While a cluster should start off from an existing endogenous competitive advantage, it needs this input from the outside in order to grow and prosper. As such these elements are prerequisites for innovation and Blue Growth. So far very limited data and performance indicators of maritime clusters (not only in the Mediterranean but also in other parts of Europe) exist to demonstrate the added value of a maritime cluster in creating economic growth and employment. But this objectively verifiable data is needed to convince on the one hand local stakeholders and on the other hand also private investors.

⁶² <http://www.project-syndicate.org/commentary/the-mediterranean-reborn>.

Relevant aspects and measures to be taken into account by policy makers could be:

1. Use / establish Maritime Cluster Days on the sub-sea basin / local level

Events on the sub-sea basin such as a 'Maritime Cluster Day' could be a mechanism to promote maritime clusters within a sub-sea basin, and to create the forum for networking among themselves or with experts, policy makers and investors. Pan-European events such as the European Maritime Days already provide the possibility for networking and exchange but mainly target the expert community. Events on the local level could have a more popular character in order to increase the outreach and internal visibility. As an example of good practice, IDIMAR has co-organised in Mallorca the "International Film Festival of the Oceans Maremostra" in order to increase visibility.

2. Establish the sustainable collection of meaningful data

Efforts are already being made to collect data. For example, country fiches, as part of Blue Growth studies commissioned by DG MARE, provide data on the Blue Economy. The Cluster Observatory has been collecting data on clusters across the EU for several years. The objective of this Study is to provide policy makers with a clear picture of maritime clusters in the Mediterranean and Black Sea. But the work has revealed severe limitations of available data on maritime clusters, which is needed to capture their economic importance and impact on the respective Maritime Economic Activities. Thus we recommend establishing a common framework for data collection by including maritime clusters in EMODnet, which will be the basis for future assessment of maritime cluster performance. The same data should also be inform the Cluster Observatory.

5.2.6 Action line 6: Stimulate trans-boundary cooperation

Trans-boundary cooperation is a crucial part of building and managing clusters, and is not just something 'extra'. Companies that act within a cluster are part of value chains that are increasingly international and fragmented, and it is crucial to invest in relations with both upstream and downstream actors elsewhere. The study also points to strong growth of maritime clusters in the non-EU part, an additional justification for reaching out to the southern and eastern shores of the sea-basins as this is where most growing maritime clusters can be found. Furthermore, many of the economic, social and environmental challenges and problems (e.g. skills, climate change, mobility, visa's, VAT, maritime safety) are common, and addressing these in a joint-up manner provides new opportunities. International cooperation can also provide an excellent tool for learning, benchmarking and improving. For this, it is necessary to meet other clusters and players outside the national context too. Policy makers can help with the following:

1. Take into account functional and existing relations within international territories

National and regional policy makers need to be aware of existing value chains and networks, and make an effort that such 'natural' counterparts are part of cooperation attempts. In this context, sea-basin strategies can provide a powerful framework for cooperation, as demonstrated by the Adriatic-Ionian sea-basin strategy. Such similar strategies are called for in other sea-basins as well, starting with the West Mediterranean sea-basin where cooperation potential appears promising.

2. Ensure internationalisation is part of cluster business plans

Policy support to internationalisation requires that cluster managers need to include these aspects into their cluster business plans. The focus and priorities should reflect the priorities of members, and include concrete actions. It is important that this is aligned with other (business) associations, and to make clear where the value added lies. For example by focusing on longer term priorities.

3. Incentivise that competency, skills and research are areas for international collaboration

When reaching out for international collaboration, pay specific attention to opportunities for learning and development. This is an area where cooperation is relatively easy to obtain and where competition and rivalry are less obvious. Cooperation between (maritime) training institutes and research centres can 'break the ice' and provide opportunities for broader cooperation. Cooperation with excellent research institutes can rapidly increase the knowledge and competency basis and existing mobility programmes (e.g. Erasmus+, Marie-Curie) can provide opportunities.

4. Promote the use of European Territorial Cooperation programmes

Within this context, it is also advised to exploit the opportunities offered by the *European Territorial Cooperation programmes*. A new round of European Territorial Cooperation programmes is about to be started, including both Transnational and INTERREG Europe programmes, both offering opportunities to promote international cluster co-operation (www.interreg4c.eu/interreg-europe).

5.2.7 Action line 7: Enhance good maritime cluster management (enabler)

Benefits from clusters depend strongly on the ability of cluster managers to focus on the right things and to do them right. Indeed, managing maritime clusters is a complex activity, as several capabilities and different skill sets are necessary. Coordinating the activities of a maritime cluster certainly requires leadership which, given the very relational and networking nature of clusters in general, should be based on soft skills and experience rather than just authority and line management. Policy makers can promote good cluster management in various ways.

Relevant aspects and measures to be taken into account by policy makers could be:

1. Promote the use of existing cluster support networks and schemes

A range of existing clusters initiatives and schemes are in place and they have been referred to repeatedly in this report. Policy makers at all levels are encouraged to bring them under the attention of cluster managers, so that they can learn from these and make best use of them. Particular reference is to be made to:

- The European Network of Maritime Clusters (ENMC);
- The Cluster Observatory;
- The European Cluster Collaboration Platform;
- The European Cluster Managers' Club (ECMC);
- The European Cluster Excellence Initiative (ECEI).

2. Launch a dedicated and open network for maritime clusters

A number of good examples are available at local, national and EU level from a variety of sectoral clustering experiences and initiatives. Nevertheless, managers of maritime clusters seem to have not yet gained the adequate level of networking and knowledge capacity needed to fully access the above opportunities.

The launch of a dedicated and open network for maritime clusters would help to boost the capacity to manage maritime clusters. It would strengthen above all emerging clusters that lack critical mass and capacity. This would allow maritime clusters to play a more important role in bringing innovation and diversification if not re-thinking of the maritime sector. Although the network would be open to all maritime clusters in the EU and its surroundings, it would have a focus on the Mediterranean & Black Sea sea-basins, and contribute to the "Mediterranean Reborn" mission.

The network could be set up by EC DG MARE as a stand-alone, or be linked to any of the above initiatives.



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