European Research for Maritime Eco(nomic) clusters governance Strategy - ERMES

Scientific annex

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Scientific Annex

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1   Introduction

These reports provide further insights into the research process and is based on the main report on the European Research for Maritime Eco(nomic) clusters governance Strategy – ERMES. This report provides details on the sources used and the methodologies applied, allowing for replication of the analysis in this study.

The report builds on the main report and is, therefore, only limited to the more detailed information, excluded from the main report. The description of tasks, results, intermediary steps and interrelation between them is published in the main report and is not repeated here.

1.1   Key definitions

To ensure clarity and consistency, key definitions were established during the study. An overview is provided below.

Eco-cluster

An eco-cluster can be defined as:

- a geographic concentration of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete, but also cooperate;
- the concentration of economic activities in groups of related industries in a specific location that are connected through multiple linkages and spill-overs.

Furthermore, urban-maritime eco-clusters develop from complex relationships between interconnected firms and other organisations, including governments. They are also located where it is possible for the industry to access and exploit maritime and sea-related activities.

Scenario

Scenarios are consistent and coherent descriptions of hypothetical futures that reflect different perspectives on past, present, and future developments; which can serve as a basis for action. In this case, scenarios are understood as potential hypothetical futures that identify functional or spatial enablers of trends that would allow for the set-up of a roadmap of region specific scenarios for urban-maritime cluster development.

Project database

The project database in this study is defined as a set of local policies and programmes that focus on urban-maritime policies and development within the stakeholder regions.

ESPON stakeholder

The stakeholders that are part of the steering committee for the ERMES Targeted Analysis include:

- The Liguria Region (ITALY), Regional public body (NUTS2), Department of Territorial Planning – Strategic rail infrastructures, Ports and Logistics Office (lead stakeholder);
- Province of Savona (ITALY) – Provincial public body (NUTS3 code: ITC32), Territorial Planning Office;
- Municipality of Genoa (ITALY) – Local public body, Genoa Municipality – Ports and Sea Sector;
- Port System Authority of the Western Sea, Ports of Genoa (ITALY) – Managing authority, EU Policy Office;
- Ministry of Maritime Affairs and Insular Policy (GREECE), Special Service of EUSF for the MMAIP;
- Crete Region (GREECE) – Regional public body (NUTS2 code: EL43);
- Heraklion Port Authority (GREECE) – Managing authority;
- Province of East Flanders (BELGIUM) – Regional public body (NUTS2 code: BE23);
- North Sea Port (NETHERLANDS) – Managing authority;
- Authority for Transport (MALTA) – Ports and Yachting Directorate.

Local stakeholder

Local stakeholders are actors that are connected to the urban-maritime system within the ESPON stakeholder regions, but are not a part of the steering committee. These include the different stakeholders from the quadruple helix, such as governments, industry, academia and civil society representatives. They are involved in multiple phases of the project (see also Chapter 4 of the inception report).

Scales of inquiry

The study focuses on the NUTS2 regions of the ESPON stakeholders. An overview of the (participating) regions and related Eurostat NUTS levels is provided in Table 1.1[1].

Table 1.1: Overview of study regions

Participating region	EUROSTAT NUTS2 classification	EUROSTAT NUTS3 classification
The Liguria Region (IT)	Liguria - ITC3	ITC31, Imperia ITC32, Savona ITC33, Genova ITC34, La Spezia
Crete Region (EL)	Kriti - EL43	EL431, Irakleio EL432, Lasithi EL433, Rethymni EL434, Chania
Province of East Flanders (BE)	Prov. Oost-Vlaanderen - BE23	BE231, Arr. Aalst BE232, Arr. Dendermonde BE233, Arr. Eeklo BE234, Arr. Gent BE235, Arr. Oudenaarde

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[1] This table was prepared with the 2021 revision of the NUTS classifications in place.

Participating region	EUROSTAT NUTS2 classification	EUROSTAT NUTS3 classification
		BE236, Arr. Sint-Niklaas
Authority for Transport (MT)	Malta - MT00	MT001, Malta MT002, Gozo and Comino/Għawdex u Kemmuna

The regions are investigated at NUTS2 level, which is the spatial scope of the study. Reasons for applying this study scope are described below.

- The European Union cohesion policies are mostly targeted at NUTS2 regions. Similarly, the European Regional Competitiveness Index (RCI) prepared by the European Commission[2] is undertaken at NUTS2 level;
- Eco-clusters are rarely concentrated at a lower scale;
- Choosing one spatial scope ensures transferability of the study results.
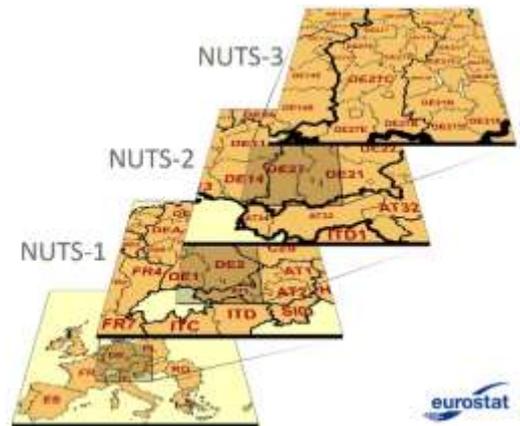
However, where necessary and possible (in terms of data availability) a more detailed level of data collection and analysis is performed. In line with the ToR, data on certain indicators are gathered and assessed in more detail (NUTS3, grid data or even local level). For example, the project team will look for specific details on port infrastructure in an individual port as opposed to a port system[3], port traffic volumes, trade flows and connectivity. Data collected during the inception phase indicated the level of detail (see Annexes 5 – 8) that can be attained.

1.2 Project objectives and linkages to the tasks

Properly developed methodologies are key to ensuring that the results of this study are sound, replicable and relevant for the stakeholders and other interested European parties. The methodological aspects are presented in this report.

The project objectives and linkages to the different tasks and activities are presented in the table below.

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[2] https://ec.europa.eu/regional_policy/sources/docgener/work/2019_03_rci2019.pdf.

[3] Specific for this project we foresee the need to discuss individual ports in a port system as North Sea Port is a cross-border port authority governing ports in both Belgium (Ghent) and the Netherlands (Terneuzen and Vlissingen). For this we rely on North Sea Port to provide this data when necessary.

Table 1.2: Overview of knowledge needs, expected outcomes and tasks and activities of the project

Knowledge needs	Expected Outcome	Task/activities
1. Determine to what extent and how clusters could contribute to the development of urban-maritime regions.	A. Territorial evidence on urban-maritime interfaces and cluster development potentials of the four selected regions. B. Urban-maritime spatial planning scenarios built on territorial differences by involving quadruple helix actors, policy- makers and city-port authorities.	Task 1: data collection and literature review of existing research on territorial evidence and spatial analysis in the selected regions.
2. Understand the ways in which clusters can contribute to local business development and networking and cooperation in maritime regions, which economic sectors are affected and what kind of actions and policies are needed to ensure sustainable and integrated management of clusters in coastal regions and island territories.		Task 2: interviews and workshops will provide first-hand insights at the local level.
		Task 2: development of scenarios up to 2030 considering regional differences. Task 1: data collection and literature review of existing research on cluster collaboration and spatial analysis in the regions.
3. Consider the regional benefits that cluster collaboration can bring to the selected regions.		
4. Identify framework conditions for strengthening the relationship between existing industrial services assets and strategical infrastructure development and determine which benefits and opportunities arise from cluster policies implementation for citizens.	C. Recommendations and guidance for the elaboration of strategies for urban-maritime, based on existing indicators on demand and thematic priorities that are transferable to similar urban-maritime regions in Europe. D. Transferability of policy recommendations and guidelines to be applied in similar urban-maritime regions in Europe.	Task 1: the overview of existing research gathered good practices.
		Task 2: interviews with local authorities provided deeper insight into the workings of the policy initiatives.
		Task 2: scenarios were developed for the framework conditions.
		Task 3: development of guidelines and recommendations for stakeholders on the elaboration of strategies.
		Task 4: the outcomes are presented in an Atlas.

2   Participatory process in every task

The study has a tailored participatory approach with specific designs for each task. The participatory approach aims to involve the affected and interested stakeholders in the process, in a way that makes the best possible use of the expertise of each stakeholder, while collecting the most relevant data and insights for each task. The participatory approach also contributes to raising awareness among the stakeholders regarding:

a)   the proposed scenarios, the relevant policies, and initiatives at regional, national and EU level;
b)   the stakeholders' own role in bringing information on conditions and developments within the given focus areas to the attention of the relevant authorities.

Figure 1 presents an overview of the stakeholder participation at the different stages of the project. The following subsections provide more detail on each participation element. An overview of the stakeholders that participated during the project is presented in Annex 4.

Figure 1: Schematic overview of the project and expected stakeholder involvement
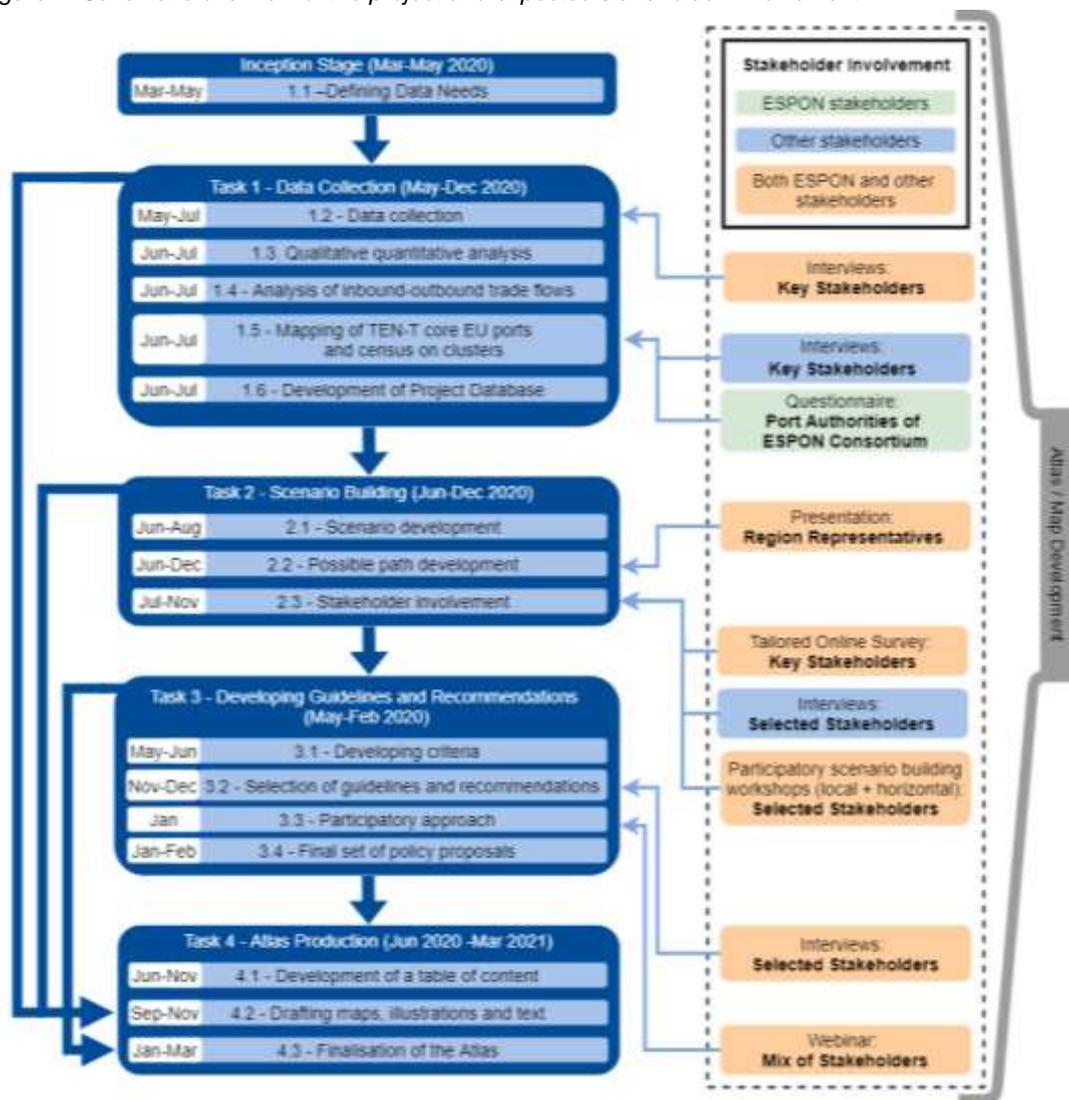
2.1 Participatory process in Task 1: Data collection

The stakeholder consultation strategy for Task 1 had a threefold focus:

- Indicating the structure of the institutional clusters by answering the following relevant questions: what are the main active actors in the region? What kind of organisational structures are in place?
- Complementing our understanding of the region's local context by performing interviews and reaching out to local experts;
- Resolving information gaps that are not solved during the first stages of data collection (literature research and/or collected data).

The aim of the participatory process was to involve a representative sample of stakeholders in each of the four regions. The following types of actors in each region were identified and involved:

- quadruple helix organisations that serve as a community platform for the urban-maritime cluster;
- port authorities (should be understood as the responsible entity that manages the seaport(s) in the four regions involved);
- regional / local policy makers / urban authorities;
- representatives of major companies in the regional port-industrial cluster (both port logistics and seaport related industries).

In the first task, two stakeholder involvement tools were deployed:

1. interviews with key stakeholders to support data collection and the mapping of the TEN-T core EU ports and census on clusters;
2. questionnaire to the port authorities of ESPON Consortium, to support the mapping of the TEN-T core EU ports and census on clusters.

Interview strategy

The project team's network of local experts allows the project team to reach out to key stakeholders in their own language. Interviews were conducted on the phone or using on line platforms such as Skype or Microsoft Teams. This approach allowed flexibility with the time and location of the interview, and was largely unaffected by any confinement measures in place due to the COVID-19 pandemic.

The interviewees were provided with the questionnaire up to a week prior to the interview. After the interview, the interviewee received the summary of the interview for validation. The interviewee was asked to return the validated summary within a specific timeline, to avoid delays in processing the responses.

The aim was to collect information about:

- the local context of each regional cluster, including the current situation of the main marine and terrestrial activities;
- trends, challenges, opportunities and risks that will influence the region;
- key stakeholders and the nature of their engagement;
- additional available information and data sources.

Survey strategy

The survey ran on an online survey tool: Check Market. The link to the survey questionnaire was disseminated via email. The online survey tool allowed the project team to monitor the response rate, and send reminder emails where relevant.

The survey was specifically targeted at the port authorities in the regions, with a view to scope and determine the development stage of the innovation clusters and relevant trends, based on previously collected data.

2.2   Participatory process in Task 2: Scenario development

The participatory approach was fundamental to the scenario building exercise and consisted of three stakeholder consultation exercises, each exercise building on the next. The three exercises were:

1) a survey;
2) a targeted in-depth interviews with one to two representatives of selected stakeholders in each region;
3) four participatory scenario building workshops (one in each region).

The input from both survey and interviews fed into the construction of the participatory scenario building workshops.

Considering the restrictions caused by COVID-19 relating to travel and the organisation of physical events, virtual alternatives for the participatory scenario building workshops were used.

Survey strategy

The survey ran an online survey tool, similarly to the port authorities survey under Task 1. It gathered specific, detailed information from a selected group of stakeholder representatives (between three and five for each region) identified by the local experts. The survey collected data of the following:

1. the weighting of parameters/variables, the assessment of change, certainty and availability of resources;
2. respondents views on the causal-effect chains;
3. respondents views on the potential scenarios;
4. identification of additional relevant stakeholders (through the snowballing approach).

Interview strategy

The interviews were conducted with selected stakeholders[4] from each region. These interviews enriched the findings from the survey, allowing more in-depth and detailed information to be gathered with the purpose of validating the developed storylines and to weigh preferences. The results of the survey and interviews were used for qualitative weighing of the cause-effect of each scenario parameter as well as to create an example of weights, assessments, and certainty of parameters and variables.

Workshops

Regional scenario-building workshops were used to gather a number of proactive stakeholders (up to 15 for each regional workshop) to codesign and further elaborate scenarios developed using data from Task 1. These stakeholders were identified through the interviews and surveys, in such a way that the most proactive, committed and informed actors are invited to these events. Overall, the workshops included a balanced mix of professionals. Particular attention was given to ensuring that relevant stakeholder groups were represented: Each of the regional scenario-building workshops gathered stakeholders from their target regions[5]

Horizontal/Interrelated Scenario

The conceptualisation and characterisation of the global dynamics of a short term scenario started with the data gathered under Task 1. Likewise, for the region-specific scenarios, the characterisation of these dynamics was supported through the development of cause-effect modelling chains, which assisted in the determination of the relevant causal relations between the scenarios and their potential impacts. This characterisation allows for a SWOT analysis of the various pathways.

The horizontal scenario was presented, validated and discussed at a horizontal workshop. The aim was to test the draft recommendations (per region) so that they can be realistic and applicable to the stakeholders in region and to obtain horizontal recommendations that could be applicable for other similar port areas in EU.

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[4] Such as port authorities, regional/local policy makers, logistic businesses (intermodal businesses), infrastructure businesses, terminal operators and shipping companies.

[5] We will consider e.g. port economic actors, leaders from the main maritime economic activities in the relevant cluster, policy makers, city/country port authorities, representatives of local, regional and/or national level administration, leaders from relevant non-governmental organisations, cluster representatives and academics in related maritime affairs for invitation.

2.3   Participatory process in Task 3: Developing guidelines and recommendations

In Task 3, guidelines and recommendations were developed. The aim of these guidelines and recommendations was to help stakeholders draft cluster related strategies for urban-maritime regions, based on the lessons learned in Task 1 and 2. Involvement of stakeholders in this task happened in two subsequent stages:

1. semi-structured interviews;
2. horizontal workshop.

Semi-structured interviews

Interviews with selected stakeholders were used to build on the outcomes of the participatory scenario-building workshops. The interviews were phone-based. The questions and topics covered were provided to interviewees in advance to ensure the most effective use of time. Notably, the interviews has two-tiers:

*   looking backwards, interviewees were asked to validate and elaborate on the lessons learned from the previous workshops;
*   looking forward, they were interviewed based on a more elaborated/advanced paper on criteria and were asked to provide their views on the draft recommendations.

Similar to the other interviews, this approach allowed flexibility with the time and location of the interview, and was largely unaffected by any confinement measures in place due to the COVID-19 pandemic.

Horizontal workshop

The horizontal workshop took place in February 2021. It was used to present and fine-tune findings and recommendations. A mix of key stakeholders identified during the local workshops (ideally two per region) were invited, as well as two to three outstanding experts that have been part of the previous round of interviews.

2.4   Participatory process in Task 4: Atlas production

The results of the stakeholder consultation in Task 1, Task 2 and Task 3 fed into the finalisation of the Atlas. More specifically, the interviews and survey in Task 1 fed into the illustration of the current situation of city-ports in Europe with regard to inbound/outbound trade flows, as well as the current situation in TEN-T core network ports with regard to eco-clusters in the respective urban-maritime regions. Task 1 outputs were used for the illustration of the current situation in the four city-port regions of the study, with regard to the local economic and infrastructure assets and the urban-maritime cluster development.

The draft maps were further developed jointly with stakeholders in the workshops in Task 2, leading to the development of schematic maps, illustrating the comprehensive scenarios for the four region and the European interrelated scenarios.

The Atlas illustrates the recommendations to authorities and organisations involved in urban-maritime clusters in the four case study regions and the territorial impact of implementing these recommendations with a focus on urban-maritime strategies.

3 Task 1: Literature review and data collection

Task 1 provided a quantitative and qualitative overview of the economic and infrastructural aspects of the four urban-maritime regions that form the core of this study. Next to this, a literature review was conducted to better understand the broader trends that affect urban-maritime regions. In addition to the literature review and data collection, there is a strong participatory element with stakeholders in Task 1. The participatory approach is described in Section 2.

3.1 Literature review

The goal of literature review was to obtain a comprehensive and up-to-date overview of the state of academic literature on the topic urban-maritime regions. In order to provide a complete overview, a search for academic literature was conducted via Google Scholar and Scopus. Both are academic literature databases. The (most) relevant literature was filtered by using different combinations of keyword searches, such as:

- maritime cluster & port cluster & cluster collaboration;
- port-city cooperation;
- waste management system;
- economies of scale in shipping;
- port hinterland transportation;
- port connectivity;
- port development & TEN-T;
- port competition;
- digital port operations;
- port- & regional & coastal & urban development;
- port-city relation;
- port governance models;
- container ports;
- port & tourism.

During the inception phase of the project, these databases were screened for relevant academic literature. In addition, publications from other related ESPON projects such as ESaTDOR, ESPON Climate, ReRisk, ECR2 or NSS - NORTH SEA STAR, SPIMA, Transport Accessibility at regional/local scale and patterns in Europe (TRACC), Comparative Analysis of Territorial Governance Spatial Planning Systems (COMPASS), ESPON Maritime spatial planning and land-sea interactions (MSP-LSI), KIT, Blue Growth Report, and ET2050 were screened. Reports and papers from international organisations, government agencies, and relevant special interest groups were also consulted.

The main topics in the literature review included:

- literature related to (seaport) cluster development;
- global trends that influence future port development including the altered context of maritime transport due to COVID-19, sustainability and energy transition, multimodality and growing ship sizes, port competition, and digitalisation;
- ports and regional development including seaport cluster development, port governance, port-city interface, and cruise tourism.

3.1.1 Data collection

The main objective of the data collection was to gather evidence on territorial economic aspects of the study regions. Collecting both quantitative and qualitative data had a twofold focus, described below.

- Providing an overview of the maritime-economic situation in every stakeholder region by answering the following relevant questions: how big is the maritime sector? And compared to the rest of the region? How well is the region connected? What kind of trade flows and/or connections exist between the study regions? What are the local economic infrastructural characteristics of the region? What is the development stage of eco-clusters in Europe's urban-maritime regions?
- Describing the current urban-maritime policies in place and taking note of strategic ambitions and visions and taking the following question into account: what are the finalised or on-going projects that contribute to the local opportunities of eco-clusters?

In regards to the first objective the inception phase of the project was used to explore the Eurostat database, retrieve necessary information from regional and local statistical databases, and collect data on the spatial and sectoral characteristics. The data was retrieved using a two-step approach, described below.

- **Bottom-up approach**: exploring all the relevant indicators (as stated in Table 3.2. of the Technical Proposal) on a European and regional level in order to provide an accurate oversight of the potential data sources. Annex 5 presents the final overview of the used data sources;
- **Top-down approach:** identifying the major data sources that are needed in further stages of the project (Task 2 scenario analysis and Task 4 production of an Atlas/Roadmap).

Performing the two-step approach led to a selection of data needs and sources. In order to optimise the extraction and analysis of these sources, they were screened on the basis of the following criteria:

- harmonised and comparable data between regions;[6]
- complexity of retrieving data in the appropriate data structure;
- publicly available data is preferred over private data that might have limitations when it comes to disclosure.

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[6] And where needed data should be recognizable and reproduceable for other European regions interested.

The second objective, collecting information on the policy directions of the region, is covered in the Project Database. In line with the ToR, the Project Database identified a list of relevant port and regional projects and policies to show the different aspects (e.g. territorial, socio-economic, and urbanisation) in the region. By means of data collection a first draft Project Database was constructed during the inception phase. A **policy template** was distributed to local experts and ESPON stakeholders to validate and complete the data.

Table 3.1: Selection of (regional) projects

Region	Project name
Authority for Transport (MT)	Strategic Plan for the Environment and Development
	Grand Harbour Local Plan
	Marsaxlokk Bay Local Plan
	Strategy for Valletta
	Marsaxlokk Inner Harbour Environment and Development
	National Transport Strategy, 2050
	Transport Master Plan, 2025
	Strategic Environmental Assessment: Environmental Report
	Marine Strategy Framework Directive (2008/56/EC): Malta's Programme of Measures Summary Report
	Integrated Maritime Policy
	PORT-PVEV Project, 2012-2015
Crete Region (EL)	New road in Crete set to improve journey times and safety"
	"Operational Programme Crete and the Aegean Islands"
	Cretan regional spatial plan
	General urban plan of Heraklion
	Regulatory plan of Heraklion
	Master plan of port of Heraklion
	North Road Axis & Ports of Crete
	Connecting Crete to mainland Greece's power supply
	Smart Specialisation Strategy of Crete Region
	Poseidon MED II – LNG Bunkering Project
	Sustage Project – Horizon 2020
Province of East Flanders (BE)	Opdracht en visie
	Gedachte wisseling rond gewestelijke havencommissariaat
	Beleidsnota 2019-2024 Mobiliteit en Openbare Werken
	Provinciaal Ruimtelijk Structuurplan
	Zeesluis Terneuzen
	Spoorverbinding Gent Terneuzen
	Havendecreet
	Studie Extended Gateway – Potenties van Oost-Vlaanderen als logistieke regio
	Opmaak Strategie voor de ontwikkeling van Oost Vlaanderen als Kennisregio
	Policy report: Subregionaal speerpuntbeleid in Vlaanderen
The Liguria Region (IT)	Port of Genoa Masterplan
	Port of Genoa Operational Plan

Region	Project name
	Projects: Vento Porti Mare, Geremia, Circumvectio, Blue Connect, Easylog, Proteus, RUMBLE, IMPATTI_NO, GNL FACILE TIGER DEMO
	POR FESR 2014-2020 (Regional Operational Programme ERDF 2014-2020)
	Smart Specialisation Strategy (S3)
	Regional Territorial Plan (PTR)
	Landscape coordinating territorial Plan (PTCP)
	Coastal Plan
	Master Plan
	Savona Town Plan
	Genoa Town Plan
	PTC Provincia di Savona (Territorial Coordination Plan of the Province of Savona)
Other	Maritime Policy Green Paper

3.1.2 Urban-maritime interfaces in the stakeholder regions

In Task 1, an indicator approach was developed to score the urban-maritime interface of the stakeholder regions in this study and other coastal areas in the EU. The indicator approach builds on the Regional Competitiveness Index (RCI). This sub-section details the steps taken.

Step 1: Regional Competitiveness Index

The RCI was used as a basis to measure the performance of 268 regions at NUTS-2 level across 28 EU Member States. The RCI score is based on 74 indicators, clustered into 11 pillars and three sub-indexes: basic, efficiency, and innovation factors of competitiveness, depicted in the table below.

Table 3.2: Cluster typology in RCI

Sub-index	Pillars	Indicators
Basic (1)	Institutions	74 separate indicators, e.g. on employment, scientific publications, household access to internet and labour productivity.
	Macroeconomic stability	
	Infrastructure	
	Health	
Efficiency (2)	Basic education	
	Higher education and lifelong learning	
	Labour market efficiency	
	Market size	
Innovations (3)	Technological readiness	
	Business sophistication	
	Innovation	

Source: Based on RCI, 2019 (https://ec.europa.eu/regional_policy/en/information/publications/working-papers/2019/the-european-regional-competitiveness-index-2019)

Step 2: Elaborating on RCI

The RCI has a broad approach and does not necessarily focus on innovation in the economy as such, nor on port-related competitiveness indicators. Thus, for the purpose of this study the RCI was further developed to be able to rank the urban-maritime interface of EU Regions.[7]

From the long-list of 74 RCI indicators, a targeted selection was made on competitiveness, regional data and port economics. In total, 23 separate indicators were retained. Then, the list was broadened by adding a fourth sub-index related to port-specific activities. Five port performance indicators were added to this fourth sub-index. As such, port relevant RCI indicators are complemented with port specific data in the newly added fourth sub-index, port performance, depicted below.

Table 3.3: Urban-maritime interfaces cluster typology

Sub-index	Pillars	Indicators
Basic (1)	Institutions	Selection of 28 separate indicators out of 74, e.g. on employment, scientific publications, household access to internet and labour productivity.
	Macroeconomic stability	
	Infrastructure	
	Health	
Efficiency (2)	Basic education	
	Higher education and lifelong learning	
	Labour market efficiency	
	Market size	
Innovations (3)	Technological readiness	
	Business sophistication	
	Innovation	
Port performance (4)	Social-economic parameters	Maritime transport of passengers
		Regional employment
	Throughput Freight	Gross weight of goods handled in main ports
		Vessels in main ports
	Port efficiency	Gross weight of goods per thousand employees

Step 3: Balancing sub-indices

The port performance indicator consists of a social-economic, freight transport and port efficiency component. The five indicators in this sub-index, build on publicly available data sources. In the table below, the methodology and data of the five indicators is presented.

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[7] For the purpose of this study ,the coastal regions in the EU28 member states are selected.

Table 3.4: Methodological framework for sub-index, port performance

Pillars	Indicators	Methodology	Data source
Social-economic parameters	Maritime transport of passengers	Indexed number of passengers in the region	Eurostat [mar_go_qmc]
	Regional employment	Indexed number of employees	Eurostat [mar_tf_qm]
Throughput Freight	Gross weight of goods handled in main ports	Indexed number of passengers in the region	Eurostat [mar_pa_aa]
	Vessels in main ports	Indexed number of vessels	Eurostat [lfst_r_lfe2en2]
Port efficiency	Gross weight of goods per thousand employees	Regional throughput / employees	- Eurostat [mar_go_qmc] - Eurostat [lfst_r_lfe2en2]

After establishing the fourth sub-index, a weighting scheme for the four RCI sub-indexes was created to be able to rank the urban-maritime eco-clusters. The weighting scheme is (also) in line with the methodological assumptions in the RCI. The weighting scheme puts emphasis on the third (innovation) and fourth (port performance) sub-index (see table below).

Table 3.5: Weighting scheme used for the four RCI sub-indices

Sub-index 1 – Basic	Sub-index 2 - Efficiency	Sub-index 3 - Innovations	Sub-index 4 – Port performance
10%	20%	35%	35%

Step 4: Cluster score as result for ranking

Finally, the indicators (23 relevant RCI indictors and 5 port-specific indicators) are used to determine a cluster score. This cluster score measures the difference between the region cluster score and the European average cluster score. This means that a positive cluster score (equal or above 9.5) is equal to or above the European average. On the other hand, a cluster score below 9.5 shows that the region scores below the European average. The results are presented in the main report in Chapter 2.

Based on the cluster scores, the development stage of urban-maritime clusters was categorised as follows:

- well below average: the lowest 25th percentile of all cluster scores (ranges from a cluster score between -9.5 and -2.8);
- below average: between the 25th and 50th percentile of all cluster score (ranges from a cluster score between -2.8 and -0.4);
- above average: between 50th and 75th percentile of all cluster score (ranges from a cluster score between -0.4 and 2.2);
- well above average: the highest 25th percentile of cluster scores (ranges from cluster score between 2.2 and 19.7).

4 Task 2: Scenario development

As mentioned before, scenarios are 'consistent and coherent descriptions of hypothetical futures that reflect different perspectives on past, present, and future developments', which can serve as a basis for action. In this study, scenarios are understood as hypothetical futures that identify functional or spatial enablers of trends that would allow for the set-up of regional specific scenarios on urban-maritime development.

As such, the aim of Task 2 was twofold:

- setting-up region-specific scenarios on urban-maritime development (one for each stakeholder region);
- elaborating one horizontal interrelated scenario based on the Global Trends identified under Task 1.

4.1 Region specific scenarios

These sections describe the framework used for setting-up the region specific scenarios. It consists of three steps:

1. conceptualisation and characterisation of regional dynamics and enabling conditions;
2. cause-effect modelling and SWOT analysis;
3. validation.

Regional dynamics and enabling conditions

The conceptualisation and characterisation of the region specific scenarios used the projects and policies identified through the Projects Database and data gathered under Task 1 as a starting point. As such, the scenarios considered take into account the region specific trends (port, urban, and regional development plans; planned infrastructures; sectorial developments; cluster developments; etc.) gathered under Task 1.

Furthermore, the characterisation of these regional dynamics also analysed the technical, economic, governance, and social capabilities of the regions to better characterise the strengths and enabling conditions of each of the target regions to achieve the potential hypothetical scenarios.

Among the social capabilities (structural and organisational), the characterisation of the eco-clusters, alliances and governance structures (performed under Task 1) served as a basis for determining the eco-cluster development status and potential towards achieving the hypothetical scenarios (i.e. centres of excellence capable of injecting new technologies, etc.).

Cause-effect modelling and SWOT Analysis

The outcomes of the characterisation of these regional dynamics provided concrete cause-effect modelling chains. The chains consist of the relevant causal pathways between the elements of the regional dynamics and their potential impacts. These outcome chains were

further developed through a SWOT analysis, where the elements of these chains were identified as enablers or barriers towards achieving the hypothetical scenarios.
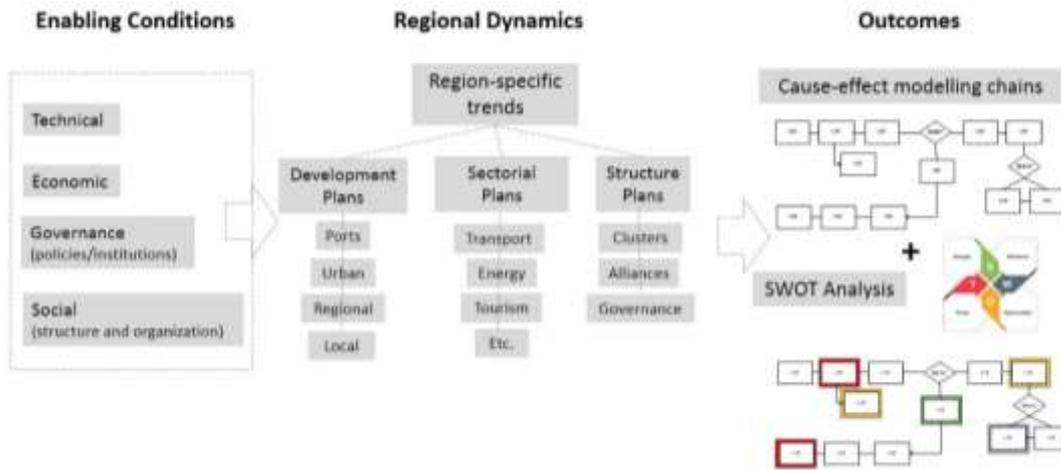
Validation

Despite The cause-effect modelling chains will were validated through surveys and interviews with regional and local experts with extensive knowledge on trends impacts. The validated cause-effect modelling chains, along with the SWOT analysis, were presented to the wider regional stakeholder community in the participatory scenario development workshops, organised for each of the target regions. The participatory approach is further detailed in Chapter 2.
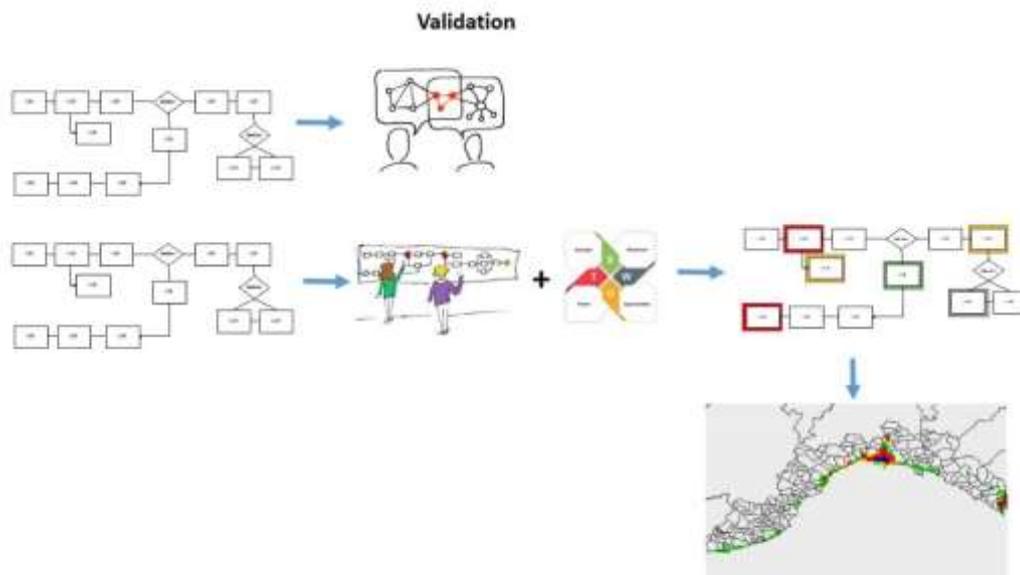
4.2 Horizontal/interrelated scenario

The conceptualisation and characterisation of the global dynamics of a short term scenario started with the data gathered under Task 1. Likewise, for the region specific scenarios, the characterisation of these dynamics would be further supported through the development of cause-effect modelling chains, which assist in the determination of the relevant causal relations between the scenarios and their potential impacts. This characterisation also allowed for a SWOT analysis of the various pathways.

4.3 Quantitative data

The refined data collection methodology resulted in a draft selection of indicators, data and/or information needs and potential data sources to extract the relevant data. In Table 4.1, these potential data sources are indicated per region. A more detailed overview of the explored data sources in the four study regions (Liguria, Crete, East Flanders and Malta) is provided in Annex 5. Data analysis provided a profound basis for scenario development.

4.3.1 Data challenges: availability, completeness, quality, harmonisation

This section provides a selection of indicators and data sources. On the basis of these, the current situation in the region was described and scenarios were developed. However, data was not always available, complete, of the same quality and harmonised. In order to cope with these data challenges, the project team obtained indicators from well-known and harmonised data sources, such as Eurostat, RCI, RES and the Ecorys Intermodal Links database. This allowed comparison between the regions and at a European level. On the basis of these data sources, the data availability is presented in the table below.

Table 4.1: Data availability

Dimensions	Data availability			
	Liguria Region	**Crete Region**	**East Flanders**	**Malta Island**
Connectivity of the region	Available	Not readily available Backup: local experts / Heraklion Port Authority	Available	Available
Economic activity	Available	Available	Available	Available
Cluster development	Available	Available	Available	Available
Level of innovation	Available	Available	Available	Available
Geography	Available	Available	Available	Available
Coherence with territorial development policies	From project database	From project database	From project database	From project database

However, not every region had symmetric information needs. Where inland shipping is an essential modality in East Flanders, and thereby an important indicator, this is not the case for other regions. Therefore, specific regional focus for data collection was essential. Part of these national and regional data sources are presented in the annexes.

5 Task 2: Urban-maritime scenarios building

Four scenario trends were presented to a targeted representation of stakeholders for each of the case study regions. These trends were based on potential global trends that seaports may be facing today and in the future, but also on the ports influence onto the nearby landscape beyond seaports. The stakeholders were asked to identify which trends applied to their respective region in the upcoming 10 years.

5.1 Literature review conclusions on scenario building

5.1.1 Global maritime and regional port trends

A range of maritime trends that impact the way port authorities operate were identified. In the section below, these trends and their potential impact on urban-maritime development are described.

Growing ship sizes

Economies of scale at sea have led to the deployment of larger containerships (Wu and Lin, 2015). In 1996, the largest containership in the world had a capacity of about 7 400 TEU, while in 2019, the largest containership in the world had a capacity of 23 765 TEU (Ge et al, 2019). Additionally, a significant number of ultra large containerships (above 15 000 TEU) are deployed to major shipping routes by 2019 (Prokopowicz *et al*, 2016).

Among businesses and academia, the discussion whether 25 000 TEU ships will still generate economies of scale is lively. However, external diseconomies of scale of large containerships (for port operators) may reduce the overall efficiency gain of ever larger containerships and put a bound to the increasing size of container ships (Lian et al, 2019; Yahalom, 2016). Furthermore, as the size of current ships is already leading to the concentration of container flows in a reduced number of ports, there is a risk that larger ships will have an (even) lower number of ports that are able to facilitate the ultra large containers (Meng e*t al*, 2017). At the same time, previous studies have always been proven wrong.

The growing container volume and the increasing ship size imposed considerable pressure on cargo terminals, leading to congestion and other negative environmental externalities (Acciaro and Mckinnon, 2013). In practice, European ports will need to develop new terminal infrastructure in order to deal with these challenges. There is also a constant need to increase and optimise hinterland transportation capacity and/or efficiency.

Multimodality

The competitiveness of seaports depends increasingly on the ability of cargo to reach their hinterland destination (Acciaro and Mckinnon, 2013; Merk and Notteboom, 2015). The main bottlenecks for European ports exist in the hinterlands rather than at the port terminals (Newton *et al,* 2010). To ensure efficient and smooth access to the market in the future, the port system

must be integrated in a multimodal (or synchromodal) transportation network that connects port and inland terminals (Acciaro and Mckinnon, 2013; Merk and Notteboom, 2015). In the European context, Newton *et al.* (2010) recommend coordination between port development and TEN-T planning.

Digitalisation

The efficiency of port operations is, besides maritime and hinterland connectivity, the main driver of port competitivity (Arvis *et al,* 2018). Digitalisation and automation provide many new opportunities to increase port productivity, increase the efficiency of port logistics and eliminate bottlenecks. Three new digital opportunities are mentioned below.

First, adequate IT systems are crucial to ease (truck and barge) congestion, increase capacity, increase the efficiency and effectiveness of gate operations, and to ensure adequate coordination and information exchange among operators (Acciaro and Mckinnon, 2013). Second, the use of IT and advanced traffic management systems will continue to move transport systems towards increasing levels of automation and efficiency (Merk and Notteboom, 2015). Third, IT in terminal management is critical to ensure efficient operations, as advanced electronic data interchange (EDI) systems provide real time information to port managers and integrate information flows from several operators (Kia et al. ,2000).

Port competition

Port connectivity and competitiveness are mainly determined by maritime connectivity, efficiency of port operations, and hinterland connectivity (Arvis *et al,* 2018). Ports can be classified as follows (Notteboom *et al,* 2019):

- gateway ports have a high focus on hinterland-bound flows and handle small transhipment flows;
- mixed ports handle a balanced mix of hinterland-bound and transhipment flows;
- pure transhipment ports focus mainly on being transhipment hubs.

Gateway and mixed ports are more prevalent in Northern Europe than in the Mediterranean, and show that pure transhipment hubs tend to have a higher throughput volatility when compared to gateway and mixed ports. Transhipment hubs face a higher uncertainty in their cargo flows, due to the contestable nature of transhipment flows. Also note that gateway demand is less contestable because of the associated logistics complexity and the high switching costs.

These findings are highly relevant when analysing the competitiveness of pure transhipment ports in the Mediterranean, such as the Marsaxlokk port in Malta. Despite the associated uncertainty, there is intense competition for transhipment cargo in the Mediterranean, as several hub ports have a low diversion distance from the Mediterranean maritime trunk line (Arvis *et al,* 2018).

In addition, the expansion of the Suez Canal, in 2015, together with the Belt and Road Initiative (BRI), has reinforced the central position of Mediterranean ports in the fastest shipping route between Asia and Europe. However, these Mediterranean ports have not yet managed to fully capitalise on their central location (Fardella *et al*, 2017), but might do so in the future.

Acknowledging the changed context of the maritime industry due to the COVID-19 outbreak

The impact of the COVID-19 outbreak on human health worldwide is large. In parallel, the economic consequences are immense and the same holds for the impact on (maritime) transport. Economies worldwide are heading towards a recession, which undoubtedly affects (maritime) transport. At this moment, it is unclear how long national lock-downs will remain in force, how economies will recover afterwards, how hard the maritime industry will be hit and how quickly the sector is able to recover. The impact of COVID-19 changes the context of the maritime industry, port and cluster development.

6 Task 3 Development of guidelines and recommendations for stakeholders on the elaboration of strategies

In Task 3, guidelines and recommendations were developed to help stakeholders draft eco-cluster related strategies for their urban-maritime regions. In Task 3.1, the criteria for the selection of policy recommendations was specified. In Task 3.2, specific policy proposals and guidelines are developed based on the scenarios from Task 2. In Task 3.3, the guidelines and policy proposals through a participatory approach with stakeholders were tested. The outcomes of Task 3.3 led to a final set of policy proposals detailed in Task 3.4.

As Task 3 used a process approach, no further methodological details are detailed in this scientific annex. For more information on the participatory process, please consult chapter 2.3 of this scientific annex.

7 Task 4: Outcomes presented in an Atlas

In Task 4, an Atlas on development opportunities with a particular focus on the four stakeholder regions was produced. The Atlas is the main product available for the wider public. It is a user-friendly synthesis for communication and outreach activities after project closure. Interested stakeholders can find (mainly visual) information on the current situation in European city-port regions as well as ideas and inspiration on possible future urban-maritime development paths. The outputs from Tasks 1, 2 and 3 serve as input for Task 4, i.e. the Atlas is based on the outcomes of Tasks 1-3 with a particular focus on policy relevant data and information.

The Atlas is a separate deliverable and therefore does no further details are provided in this scientific annex.

8 Suggestions for further research

Below we provide some suggestions for further research. The suggestions are based on additional questions that arose during the implementation of the ERMES project.

- The project team suggest to further examine the degree of transferability of the eco-cluster concept to sectors or regions other than urban-maritime regions. This ERMES study focused on urban-maritime regions in particular, whereas the eco-cluster concept can also provide relevant insights for other regions in Europe. In this context, it could be worthwhile to redevelop the eco-cluster index that was developed in the framework of this ERMES study;
- One of the main recommendations of this study was to stimulate and facilitate transnational cooperation to tackle the challenges that many regions face. As such, the needs for cooperation and potential barriers for cooperation can be further defined, and a handbook on transnational cooperation could be of added value for many European regions;
- All urban-maritime regions face a different type of governance structure. In some countries, port authorities have very little influence whereas in other areas, they are the main policy making authority for maritime activities. Governance systems largely determine the policy making process. With the use of a typology for different types of governance structures, recommendations could be formulated and adapted to be more specific to these structures – making it easier to transfer recommendations across regions with similar governance structures;
- The concept and implications of insularity have been addressed to some extent in this study, but they a worthy of further extensive examination. Consideration of the governance structure would be highly relevant when perusing this. For example, further may wish to address the questions of '*is the island part of a larger nation (e.g. Crete), or is the island a self-standing country (e.g. Malta)?*' and '*what does this mean in terms of opportunities and challenges for eco-cluster development?*';
- The current pandemic has had wide implications for the urban-maritime sector, in terms of the transport of both goods and people as well as associated economic activities (e.g. on tourism). It is as of this moment still unclear what the long-term impacts of the pandemic will be on the developments of the maritime sector. It would be worthwhile to further examine this in a separate study.

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Annex 2 – Interview outline

Table 8.1: Interview outline – local experts

Interview topics	Indicative questions
Strategy documents	Which international, regional and local strategy documents should be consulted?
Economic impact	What is the broader economic direction of region? And what are the main underlying report/studies that identify the direction?
	Are there specific impact reports available?
Maritime structure of the region	What are the main urban-maritime related sectors?
	What is the maritime structure of the region?
Local policy documents	What is the recent local economic infrastructural strategy? And in which of the local policy documents is the strategy captured?
Transport data of the port	Are there local reports or information transport flows through the port? What, if any, are the local inbound/ outbound trade flow databases?

Annex 3 – Policy and stakeholder template

The templates below should be used as a starting point to gather relevant policy documents from the stakeholder region, and to gather information on relevant stakeholders. Please fill out the fields and feel free to add new rows if more relevant information is available.

Q: Could you please identify the (most) interesting projects and/or policy documents for region X

No.	Project name (title) / Policy document	Summary of project or policy (+- 200 words)	Stakeholders involved	Relevant policy documents (in .pdf or word)
1.	*Here we ask you to provide names of projects, or titles of policy documents that are relevant for urban-maritime development in the stakeholder region.*	*Please summarise the content of the project or policy document*	*Please list the different stakeholders that are involved in the policy or project*	*Please share the mentioned policy documents (through WeTransfer).*
2.				
3.				
4.				
5.				
6.				
7.				
8.				
Etc.				

Q: Could you please identify the main stakeholders in the region X?

Sub-group	Stakeholder name	Main reason for inclusion	Contact information
Port Authorities	*What is the name of the organisation?*	*What is the reason for including this stakeholder in the list?*	Name: Position: Email:
Regional / Local Policy Makers			
Representatives of major companies			
Civil society			
Academia or research institutes			

Annex 4 – Overview of stakeholders

Table 8.2: Overview of stakeholder participation during the course of the project

Region	Organisation	Type
Interviews		
East flanders	Provincie Oost-Vlaanderen	Public authority (local / regional)
East flanders	Provinciale Ontwikkelingsmaatschappij (POM) Oost-Vlaanderen	Public authority (local / regional)
Liguria	SIIT Scpa (Sistemi Intelligenti Integrati)	Industry/research
Liguria	University of Genova	Higher education centre or university centre
Malta	Malta Maritime Forum	NGO (local / regional / national)
Regional workshop		
Crete	Ministry of Maritime Affairs and Insular Policy (GREECE	National authority
Crete	Ministry of Maritime Affairs and Insular Policy	Public authority
Crete	TEI of Crete	Research
Crete	Region of Crete	Public authority (local / regional)
Crete	Heraklion Chamber of Commerce and Industry	Chamber of commerce
Crete	The Centre for Research and Technology-Hellas – CERTH	Research
Crete	Heraklion Port Authority SA	Public authority (national / international)
Crete	Heraklion port Authority	Public authority (national / international)
East flanders	North Sea Port	Port authority
East flanders	DFDS	Business development manager
East flanders	Arcelor Mittal	
East flanders	Provincie Oost-Vlaanderen	Public authority (local / regional)
East flanders	Provinciale Ontwikkelingsmaatschappij (POM) Oost-Vlaanderen	Public authority (local / regional)
East flanders	Departement Mobiliteit en Openbare werken	Regional authority
Liguria	Ligurian Technological District SIIT Scpa	Cluster of cooperating territorial bodies: research, large, medium and small enterprises
Liguria	Camera di Commercio Riviere di Liguria	Chamber of commerce
Liguria	IIC Istituto Internazionale Comunicazioni	Research
Liguria	Liguria Cluster for Maritime Technologies	Company
Liguria	Ministry of Transports	Public body (regional)
Liguria	Startup4life	Industry portal
Liguria	Liguria Region	Region
Liguria	Ports of Geona	Port authority
Liguria	Municipality of Genoa, Infrastructure and port planning	Municipality

Region	Organisation	Type
Liguria	Province of Savona, Territorial and urban planning	Province
Liguria	Ports of Geona, Planning and Development Dept. - EU Policy Office	Port authority
Liguria	Municipality of Genoa	Municipality
Liguria	Province of Savona	Province
Liguria	Municipality of Genoa	Municipality
Liguria	Ligurian Cluster for Maritime Technologies (DLTM)	Cluster of cooperating territorial bodies: research, large, medium and small enterprises
Liguria	Assarmatori	Shipping industry representative
Liguria	START 4.0 - Competence Center	Industrial portal
Liguria	Ligurian Cluster for Maritime Technologies (DLTM)	Cluster of cooperating territorial bodies: research, large, medium and small enterprises
Liguria	START 4.0 - Competence Center	Industrial portal
Liguria	Italian Centre of Excellence on Logistics, Transport and Infrastructures (CIELI)	Research
Malta	The Gozo Business Chamber	NGO (local / regional / national)
Malta	Transport Malta - Ports & Yachting Directorate	Public authority (national / international)
Malta	Valletta Gateway Terminals	Company
Malta	Malta Industrial Parks	Industrial park
Malta	Malta Marittima Agency	Government agency
Malta	Malta Industrial Parks	Industrial park
Malta	Valletta Gateway Terminals	Company
Malta	Malta Maritime Forum	NGO (local / regional / national)
Horizontal workshop		
Crete	Ministry of Maritime Affairs and Insular Policy	Public authority
East flanders	Departement Mobiliteit en Openbare werken	Regional authority
Liguria	Liguria Region	Region
Liguria	Municipality of Genoa, Infrastructure and port planning	Municipality
Liguria	Province of Savona	Province
Malta	Transport Malta	Public authority (national / international)
East flanders	Provincie Oost-Vlaanderen	Public authority (local / regional)
East flanders	North Sea Port	Port authority
Malta	Infrastructure Malta	Government agency
Survey		
Crete	Hellenic Centre for Marine Research	Research organisation (governmental)
Crete	Region of Crete	Public authority (local / regional)
Crete	Institute of Applied and Computational Mathematics Foundation for Research and Technology - Hellas	Higher education centre or university centre
Crete	Municipality of Chersonissos	Public authority (local / regional)

Region	Organisation	Type
Crete	Heraklion Port Authority SA	Public authority (national / international)
Crete	FORTH, Coastal & Marine Research Lab	Research centre
East flanders	Flemish government	Public authority (local / regional)
East flanders	Mobiliteitsraad van Vlaanderen	Advice to government
East flanders	North Sea Port	Company
East flanders	Provincie Oost-Vlaanderen	Public authority (local / regional)
East flanders	Voka Chamber of Commerce East Flanders	Industry association
East flanders	Provinciale Ontwikkelingsmaatschappij (POM) Oost-Vlaanderen	Public authority (local / regional)
Liguria	Circle spa	Company
Liguria	Ligurian Technological District SIIT Scpa	Cluster of cooperating territorial bodies: research, large, medium and small enterprises
Liguria	Liguria Cluster for Maritime Technologies	Company
Liguria	ASSAGENTI - Associazione Agenti Raccomandatari Mediatori Marittimi	Industry association
Liguria	University of Genova	Higher education centre or university centre
Liguria	Assarmatori	Industry association
Malta	The Gozo Business Chamber	NGO (local / regional / national)
Malta	Malta Freeport Corporation	Public authority (national / international)
Malta	Transport Malta - Ports & Yachting Directorate	Public authority (national / international)
Malta	Grand Harbour Regeneration Corporation (GHRC)	Public authority (national / international)
Malta	Malta College of Arts, Science and Technology	Higher education centre or university centre
Malta	Malta Maritime Forum	NGO (local / regional / national)

Annex 5 – Detailed overview of (territorial) data sources

Dimension	Indicator	Liguria	East-Flanders	Malta	Crete
Connectivity of the region	Intermodal connections (e.g. ferry connections)	Derived from Ferrylines (link) and Ecorys Intermodal Links (2020) (link)	Not applicable	Derived from Ferrylines (link) and Ecorys Intermodal Links (2020) (link)	Derived from Ferrylines (link) and Ecorys Intermodal Links (2020) (link)
	Road connections	Not applicable	Not applicable	Derived from typical traffic from Google Maps (2020) (link)	Derived from typical traffic from Google Maps (2020) (link)
	Maritime transport of passengers by NUTS 2 regions	Eurostat [tran_r_mapa_nm] (2018) (link)	Eurostat [tran_r_mapa_nm] (2018) (link)	Eurostat [tran_r_mapa_nm] (2018) (link)	Eurostat [tran_r_mapa_nm] (2018) (link)
Economic activity	Gross domestic product (GDP) at current market prices by NUTS 3 regions	Eurostat [nama_10r_3gdp] (2018) (link)	Eurostat [nama_10r_3gdp] (2018) (link)	Eurostat [nama_10r_3gdp] (2018) (link)	Eurostat [nama_10r_3gdp] (2018) (link)
	Employment by age, economic activity and NUTS 2 regions (NACE Rev. 2)	Eurostat [lfst_r_lfe2en2] (2018) (link)	Eurostat [lfst_r_lfe2en2] (2018) (link)	Eurostat [lfst_r_lfe2en2] (2018) (link)	Eurostat [lfst_r_lfe2en2] (2018) (link)
	Direct port related employment (measured in number of employees)	Port of Genoa (2016) (link) (link)	Havenmonitor (2020) (link) Mobiliteitsraad (2020) (link)	Malta government (2019) (link)	Not applicable
	Indirect port related employment (measured in number of employees)	Port of Genoa (2016) (link) (link)	Havenmonitor (2020) (link) Mobiliteitsraad (2020) (link)	Not applicable	Not applicable
Freight and passenger transport	Gross weight of goods handled in main ports by direction and type of cargo	Eurostat [mar_go_qmc] (2018) (link)	Eurostat [mar_go_qmc] (2018) (link)	Eurostat [mar_go_qmc] (2018) (link)	Eurostat [mar_go_qmc] (2018) (link)

Dimension	Indicator	Liguria	East-Flanders	Malta	Crete
	Total throughput (measured in tonnes of cargo handled) in ports	Port of Genoa (2019) (link)	North Sea Port (2020) (link)	NSO (2019) (link)	Hellenic Statistical Authority (2019) (link)
	Total containerised trade (loaded and unloaded) in TEUs	Port of Genoa (2019) (link)	Mobiliteitsraad (2020) (link)	NSO (2019) (link)	Hellenic Statistical Authority (2019) (link)
	Maritime transport of passengers by NUTS 2 regions	Eurostat [tran_r_mapa_nm] (2018) (link)	Eurostat [tran_r_mapa_nm] (2018) (link)	Eurostat [tran_r_mapa_nm] (2018) (link)	Eurostat [tran_r_mapa_nm] (2018) (link)
	Trans-European Transport Network (TEN-T) - Core and comprehensive ports	European Commission (2020) (link)	European Commission (2020) (link)	European Commission (2020) (link)	European Commission (2020) (link)
	Trans-European Transport Network (TEN-T) - Motorways of the Sea	European Commission (2020) (link)	European Commission (2020) (link)	European Commission (2020) (link)	European Commission (2020) (link)
Cluster development	Regional Competitiveness Index (RCI)	RCI (2019), RCI scorecard (link)	RCI (2019), RCI scorecard (link)	RCI (2019), RCI scorecard (link)	RCI (2019), RCI scorecard (link)
	Maritime Cluster Typology[8]	Constructed by Ecorys (based upon RCI (2019))	Constructed by Ecorys (based upon RCI (2019))	Constructed by Ecorys (based upon RCI (2019))	Constructed by Ecorys (based upon RCI (2019))

[8] Author assessment described in section 3.4.