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

Targeted Analysis

Atlas

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Atlas

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

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Disclaimer:
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The information contained herein is subject to change and does not commit the ESPON EGTC and the countries participating in the ESPON 2020 Cooperation Programme.

The final version of the Atlas will be published as soon as approved.

Table of contents

List of Maps

List of Figures

1 Introduction

Ports and their surrounding urban-maritime regions play an important role for Europe's territorial fabric. As land-maritime interfaces, they serve as entry and exit points for freight and passengers alike. They ensure flows and exchange between distant regions. Hence, they are important not only for their immediate hinterland but also for other regions around Europe.

Eco-clusters in urban-maritime regions are the research object of the ESPON study on European Research for Maritime Eco(nomic) clusters governance Strategy (ERMES). Thus, first, the two key terms – *eco-clusters* and *urban-maritime regions* – need to be defined.

Clusters are not simply an abstract concept – they are an economic phenomenon. Businesses are not simply interconnected through multiple linkages along the value and supply chain – they economically benefit from these linkages and subsequent spill-overs as pointed out by the European Commission.[1] In addition, the relationship between a business sector and relevant institutions plays an important role for the economic success of businesses.[2] Based on these considerations and with a particular focus on sustainability, an *eco-cluster* is defined as *'a geographic concentration of interconnected economic activities and related institutions that cooperate and compete to achieve (environmentally) sustainable economic development'.*

The focus of the ESPON study is on urban-maritime clusters.[3] Urban-maritime clusters are located in urban areas in close proximity to the coast. Industries choose these locations because their business models are related to maritime activities and/or they depend on good maritime accessibility and maritime transport infrastructures. Urban-maritime clusters are of particular importance for the development perspectives of islands. Many islands face similar challenges, e.g. related to transport, trade, market accessibility, economies of scale, economic dependency, vulnerabilities to external shocks, and access to funding, technology and know-how. The precise level of exposure to these challenges depends on island-specific features such as size, population, location, urban endowment and institutional arrangements.

This Atlas provides an overview of the main outcomes of the ESPON project. To set the scene, the Atlas sheds light on the role of ports and urban-maritime regions in Europe (chapter 2). Afterwards, the current situation as well as future development perspectives are presented for four European urban-maritime regions, namely the region of Liguria in Italy (chapter 3), the Greek island of Crete (chapter 4), East Flanders in Belgium including surrounding Dutch areas (chapter 5), and the island state of Malta (chapter 6). The Atlas concludes with a set of recommendations to promote development in European urban-maritime regions (chapter 7).

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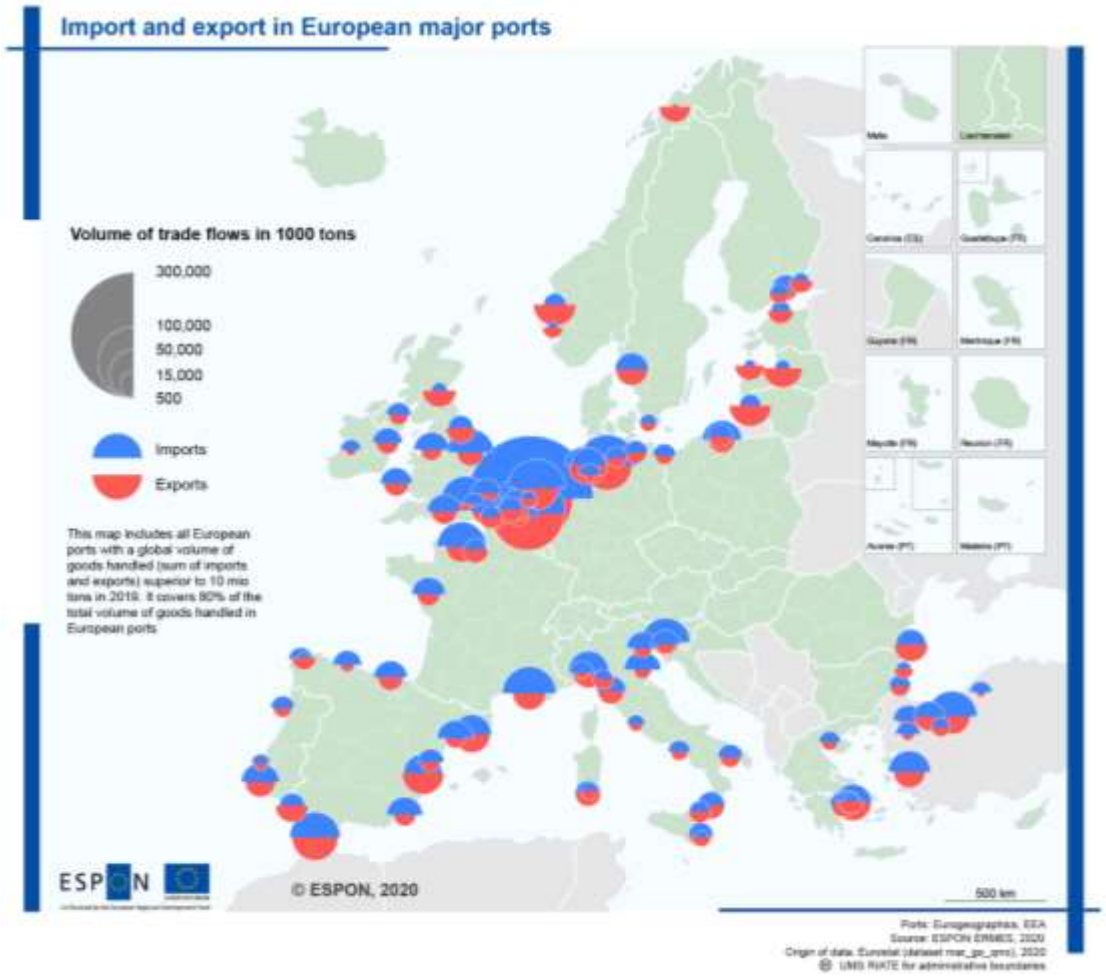
[1] European Commission (2016), Smart Guide to Cluster Policy. How to support SME Policy from Structural Funds.

[2] Porter, M. E. (1998), Clusters and the new economics of competition (Vol. 76, No. 6, pp. 77-90). Boston: Harvard Business Review.

[3] Doloreux, D. (2017), What is a maritime cluster? Marine Policy, 83, 215–220.

2 Urban-maritime regions in Europe – an overview

Overall, one can distinguish ports by their involvement in the transport of passengers and freight. With regard to the transport of goods, most European ports import more goods than they export – meaning that products produced in other parts of the world are brought to Europe for further processing or sale. Ports with higher exports than imports can mainly be found around the Baltic Sea and in Norway. Overall, northern French, Dutch, Belgian and German ports stick out as ports with highest transport volumes (*Map 2–1*). This region called the Hamburg-Le Havre (HLH) range, also shows an overall high density of ports. Together with ports in the Mediterranean such as Marseille (France) and Algeciras (Spain), they are among the largest ports in Europe. Each port in the HLH range has developed a clear profile. For instance, the Port of Rotterdam, Europe's largest port, has a strong position in the liquid bulk and container market, while the Port of Amsterdam is strong in oil products and dry bulk. The Belgian Port of Zeebrugge specialises in roll-on/roll-off transports like car imports and ferry connections while the port of Antwerp mainly handles containers and chemical products.

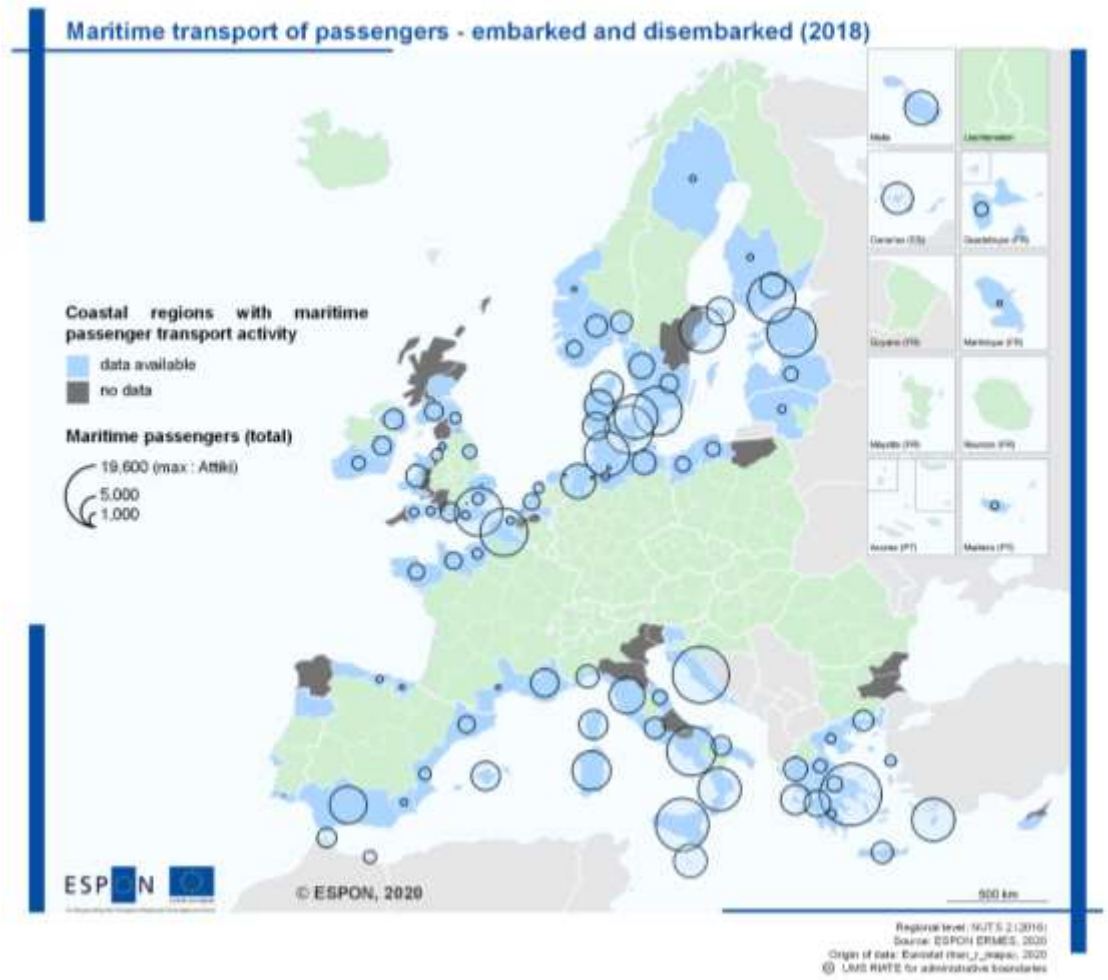


Map 2–1 Import and export in European major ports (2019)

European ports are key nodes not only for global supply chains but also for the transport of people. In 2018, more than 400 million passengers passed through EU ports. More than one in three passengers passed through Italian and Greek ports which makes Italy (85 million) and Greece (73 million) the leading seaborne passenger countries in Europe and the eastern Mediterranean Sea around Croatia, Greece and Italy one of the main hotspots of passenger transport.

From a European perspective, more hotspots can be identified (*Map 2–2*): The northern Baltic Sea with connections between Estonia, southern Finland and western Sweden, the western Baltic Sea and Skagerrak/Kattegat region between Denmark, northern Germany and southern Sweden, and the English Channel between Calais/Dunkirk in France and Dover in the United Kingdom.

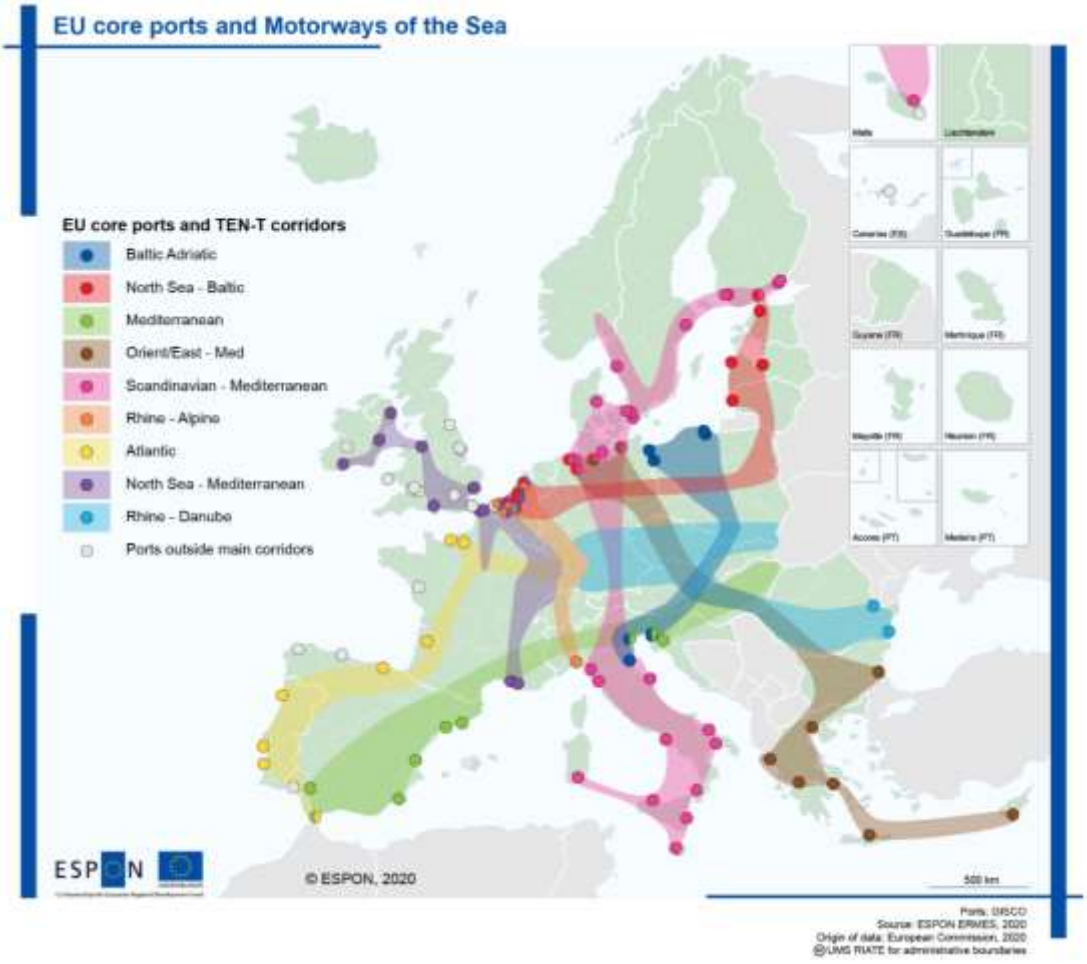
In contrast, coastal regions in the western Mediterranean as well as most regions along the Atlantic coast and around the North Sea show comparatively low numbers of embarked and disembarked passengers.



Map 2–2 Maritime transport of passengers - embarked and disembarked (2018)

Due to their importance for various transport flows, European ports receive particular attention in transport policies. At the EU level, they play an important role for the EU policy on trans-European transport networks (TEN-T), including its main funding instrument, the Connecting Europe Facility (CEF). The TEN-T policy aims at improving the interoperability and interconnectedness of national transport networks. The TEN-T network consists of two layers. The comprehensive network is the overall transport network that ensures the accessibility and connectivity of all regions in Europe. Based on this comprehensive network, the core network forms the backbone of the comprehensive network. It consists of those elements with the highest European added value and has a particular focus on cross-border sections, missing links, multimodal connecting points and major bottlenecks. Their functioning is of overarching importance for the functioning of the entire network.

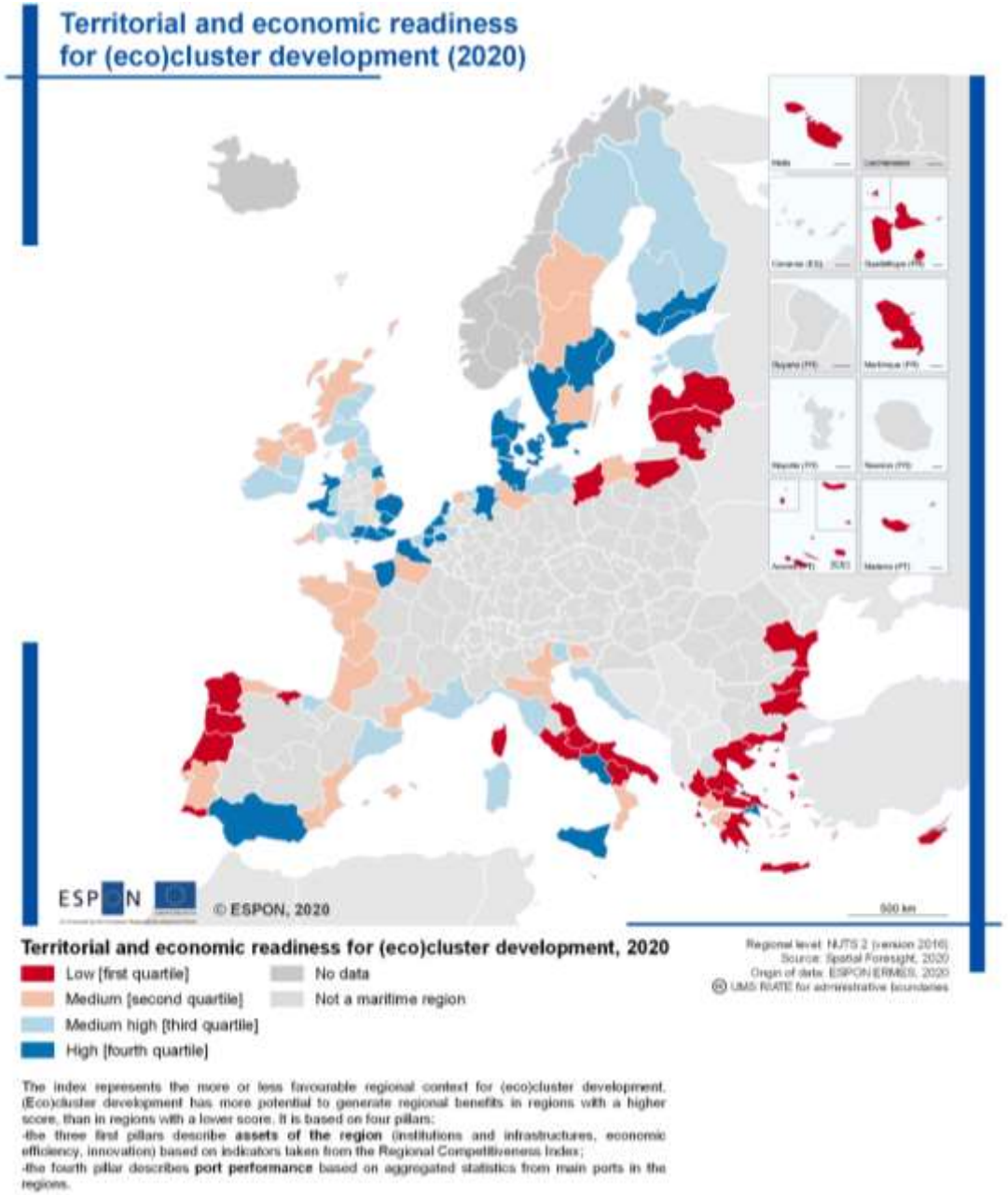
Core network corridors are an instrument to coordinate activities on transnational scale that aim at developing the core network. Core ports are those ports that are essential for at least one core network corridor. These ports are the key interfaces between maritime and land transport. They ensure connectivity between maritime transport, short-sea shipping and hinterland transportation by rail, road and pipelines. At EU level, nine core network corridors exist (*Map 2–3*), complemented by the Motorways of the Sea as the maritime pillar of the TEN-T network.



Map 2–3 EU core ports and Motorways of the Sea

The economic success of port regions does not only depend on the port itself. The regional preconditions for economic development are also important. They define the context in which maritime businesses and clusters flourish. The urban-maritime eco-cluster index describes the overall readiness for cluster development. It consists of information on regional competitiveness and port performance and, hence, allows for an assessment of the regional performance.

Looking into the European pattern reveals that the top maritime regions (4th quartile) are concentrated along the HLH range, the United Kingdom and the Nordic countries but can also be found in the Mediterranean Sea (e.g. Andalucía, Sicily, Campania and Athens). Port regions with lowest values (1st quartile), in contrast, are concentrated in the Black Sea, the eastern Mediterranean, the Baltic Sea and northern Portugal / northwest Spain (Map 2–4).



Map 2–4 Territorial and economic readiness for eco-cluster development (2020)

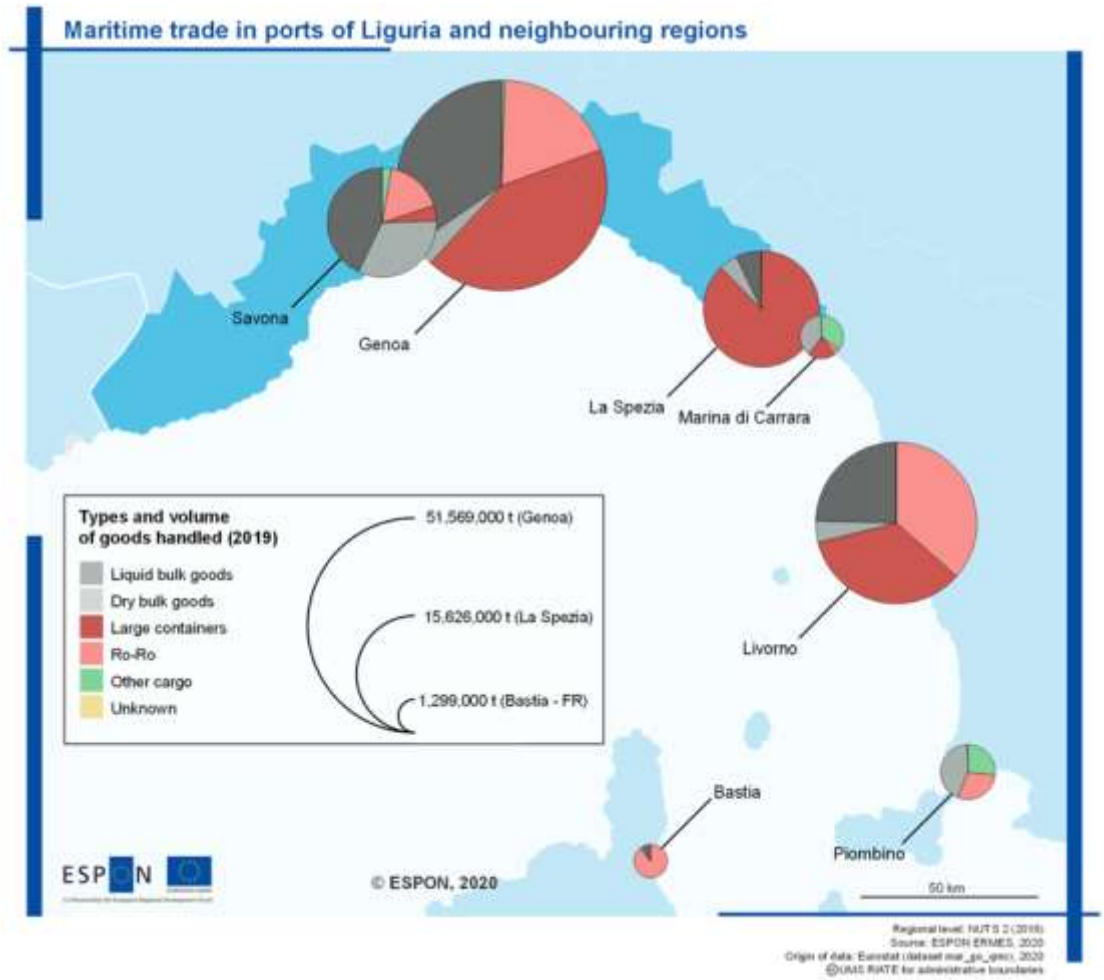
3 The urban-maritime region in western Liguria

To provide a comprehensive overview, the following starts with a description of the current situation in the urban-maritime region of Liguria, followed by an outlook into relevant trends, opportunities and threats relevant for future development and recommendations.

3.1 Present situation

Italy's major ports in terms of total traffic, product diversity and economic output are situated in the Ligurian region. Genoa is the leading Mediterranean gateway port for industrial and consumer centres in northern Italy. Since 2009, the total cargo handled in the port of Genoa increased by 8 %, container cargo even by 50 %.

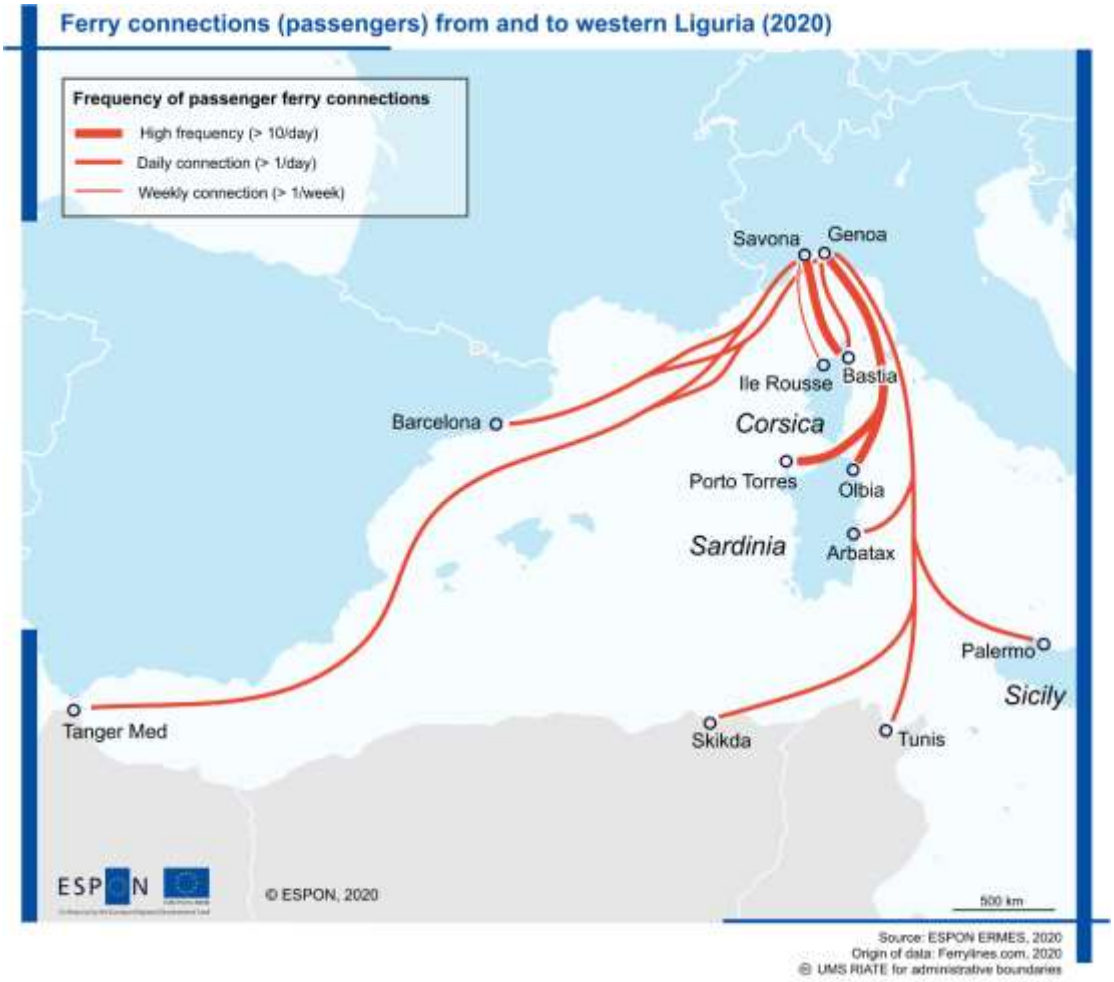
The ports of Genoa (52 million tonnes) and the port of (14 million tonnes) are the most important ports. Both ports show similar shares of trade volumes in liquid goods (Genoa: 35 %, Savona: 43 %) and roll-on/roll-off transports (Genoa: 19 %, Savona: 17 %). While the port of Genoa focuses on large containers (42 %), the port of Savona has specialised on dry bulk (33 %). Most ports in the wider region handle various types of goods and do not focus on single types of goods (*Map 3–1*). Only some ports depend on a single type such as the port of La Spezia on large containers (88 %) and the port of Bastia on roll-on/roll-off transportation (89 %).



Map 3–1 Maritime trade in ports of Liguria and neighbouring regions

The ports of Genoa and Savona play an important role for passenger transport in the Mediterranean Sea as they connect its northern and southern shores. The ports offer ferry connections between large Mediterranean islands such as Corsica, Sardinia and Sicily and the European mainland (*Map 3–2*). In addition, they also provide ferry services to Barcelona in Spain and different ports in northern Africa such as Tanger-Med in Morocco, Skikda in Algeria and Tunis in Tunisia.

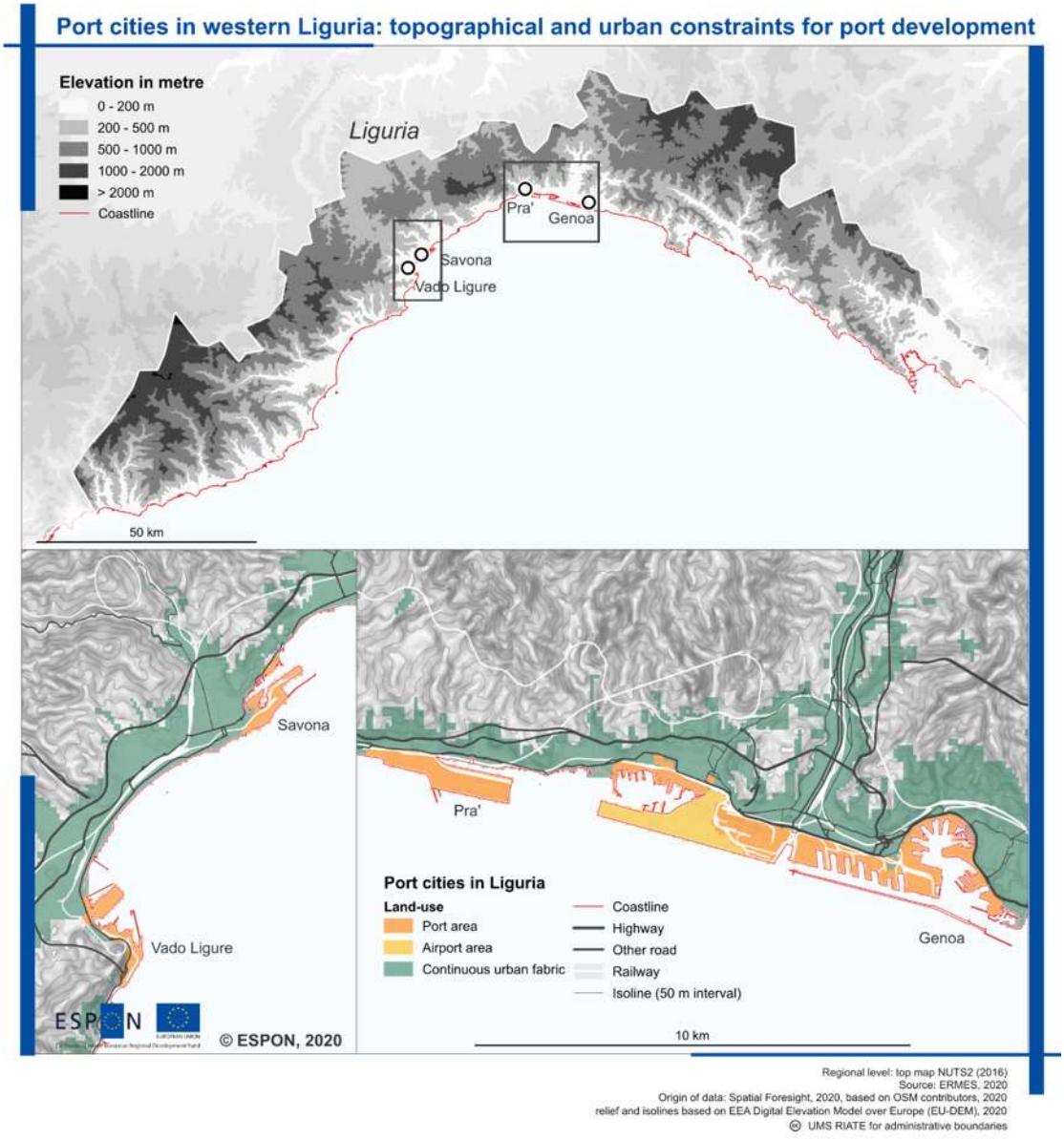
Most frequent connections exist between Savona and Bastia (Corsica) and, respectively, between Genoa and Porto Torres and Olbia (both Sardinia). These connections are operated more than ten times per day. Most other ferry connections to/from other islands and cities are offered less frequently, still on a regular basis (more than once per day).



Map 3–2 Ferry connections (passengers) from and to western Liguria (2020)

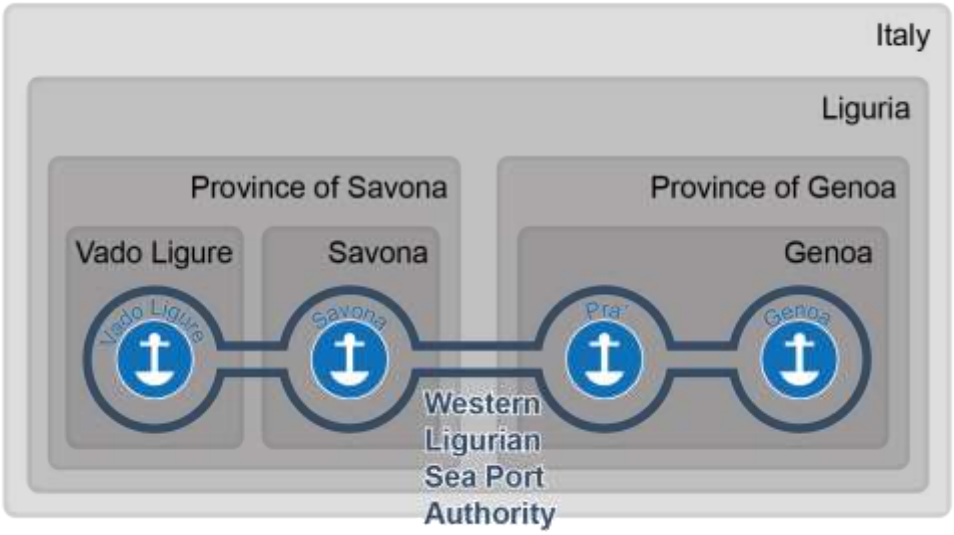
The main port infrastructures that belong to the ports of Genoa and Savona are located along the coastline of the four cities of Genoa, Pra', Savona and Vado Ligure, from east to west. The direct hinterland of the main urban centres is mountainous. This restricts the possibilities for future port developments. Only a relatively narrow strip along the coastline is available for port development which has implications for future expansions of the ports as well as for connections between the ports and the hinterland.

The urban fabric is another limiting factor for future port development. Residential neighbourhoods, business areas and the airport of Genoa are located in close vicinity to the port areas (*Map 3–3*). Land scarcity consequently leads to conflicts about land use. This requires local and regional players to define priorities and make strategic decisions about land use in line with commonly shared long-term development objectives.



Map 3–3 Port cities in western Liguria: topographical and urban constraints for port development

The political-administrative context provides the overall framework in which all port development activities are embedded. It consists of different levels, from local to national level



(*Figure 3–1*). All these levels influence the future of port development. Since a port reform in 2016, the ports of Genoa, Savona and Vado Ligure together form the Port Authority System of the Western Liguria Sea. The other ports in Liguria, namely La Spezia and Marina di Carrara form the Port Authority System of the Eastern Liguria Sea. Both port authority systems are non-economic public entities. They have taken over the duties and power of the traditional port authorities. The new broader geographical scope facilitates coordination between the ports. The merging of single port authorities under one roof furthermore contributes to faster decision-making processes.

The Western Ligurian Sea Port Authority is now under the guidance and authority of the national Ministry for Infrastructure and Transport. While the executive authority of the national government on port development has increased since the reform, the provinces of Savona and Genoa have lost power and influence.

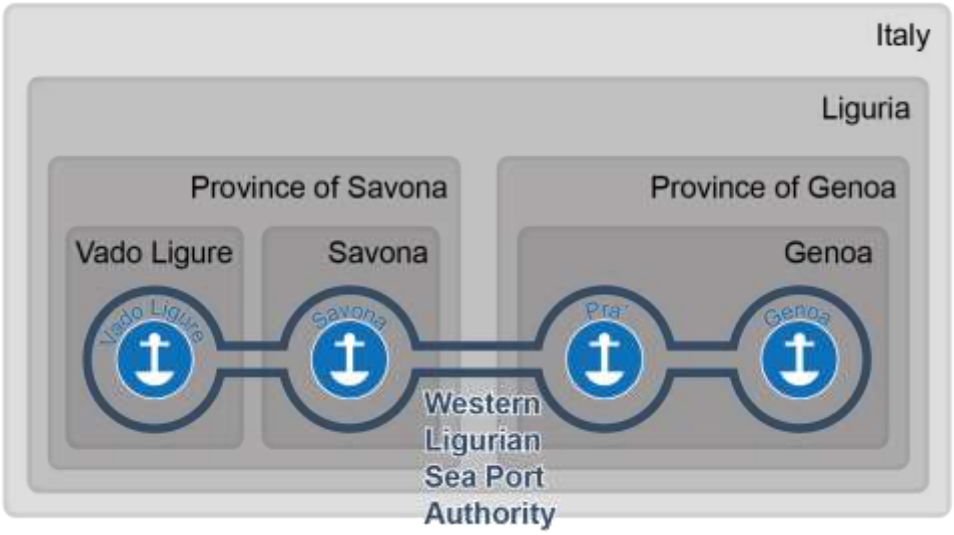


Figure 3–1 Political-administrative context for the Western Ligurian ports

Within this overall context, a variety of different players work on port development in the urban-maritime region. A distinction of players can be made based on two key features. First, a focus on public or private interests and the ownership structure and, second, the thematic focus and sector orientation (i.e. port operations and development, spatial planning and land use, business development and industries, research). Local and regional authorities as well as national ministries form the core of relevant actors (

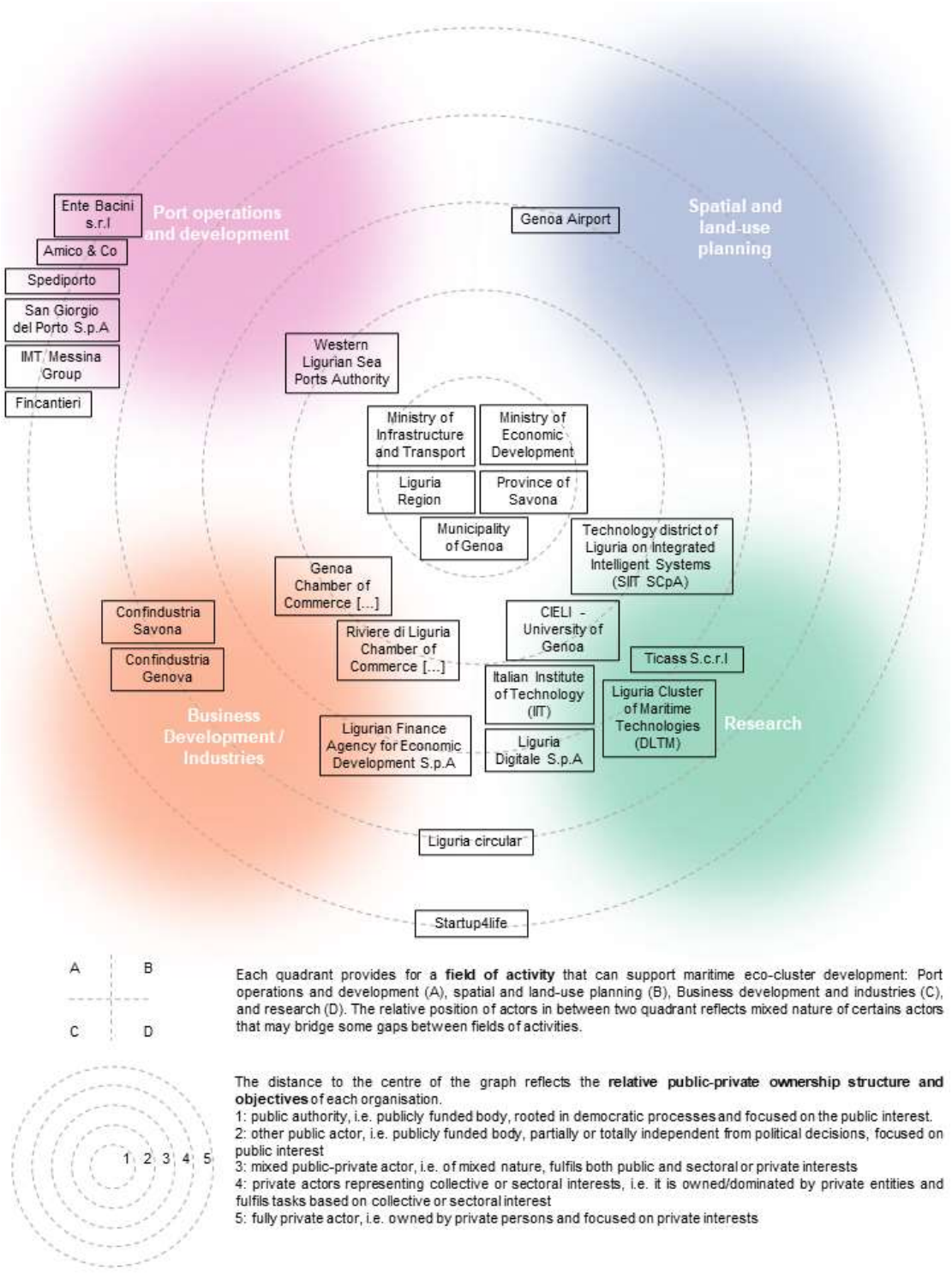


Figure 3–2). In the fields of business / industries and research, a variety of public-private and private actors is active, including chambers of commerce, business associations, universities

and cluster organisations. Port operations, on the other hand, are mainly dominated by private enterprises. This diversity and complexity of actors implies, inter alia, diverging interests that need to be coordinated from an overarching perspective aiming for balanced spatial development in the urban-maritime region.

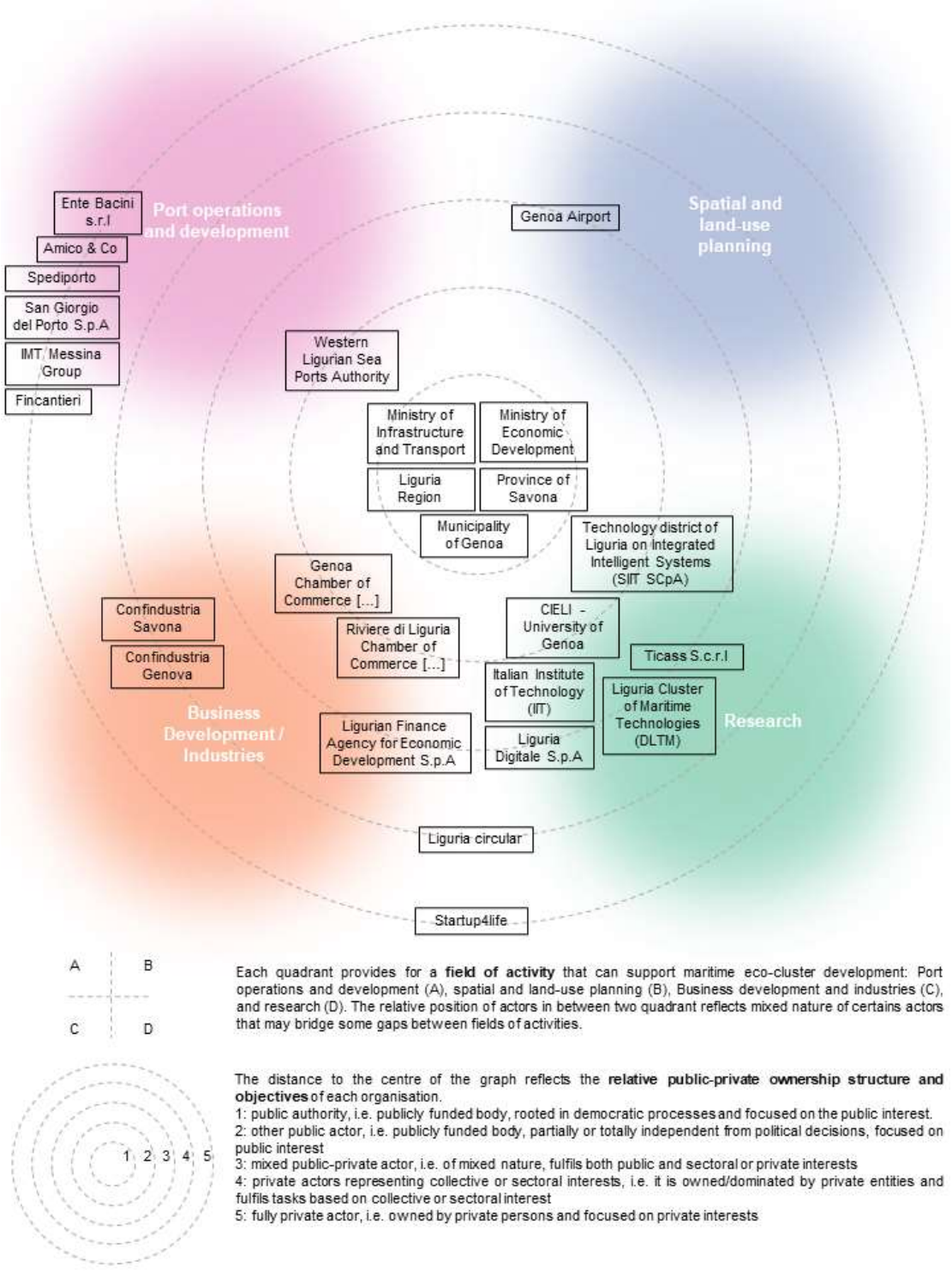


Figure 3–2 Overview of actors relevant for port development in the ports of Genoa and Savona

3.2 Future perspectives

Within the 'Liguria 2022' initiative, the spatial vision *'Liguria: From the Sea to Life'* defines new trajectories for the future development of the region. It actively engages entrepreneurial leaders, institutional actors as well as civil society. The spatial vision focuses, inter alia, on the sea as a resource of economic growth and well-being and the role of Ligurian ports and innovation in the region's future as the capital of the maritime economy. Consequently, trends in the fields of 'innovation and digitalisation' and 'enhancement of sustainability' are of major (fully shaded – in blue) or some (partially shaded – in green) relevance for future port development and will become more important if the impact of present activities and efforts fully unfolds (Figure 3–3).

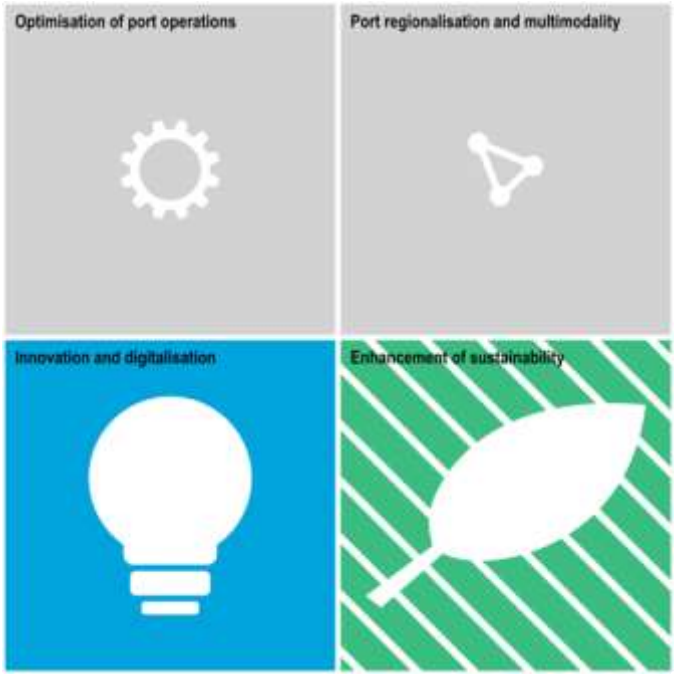
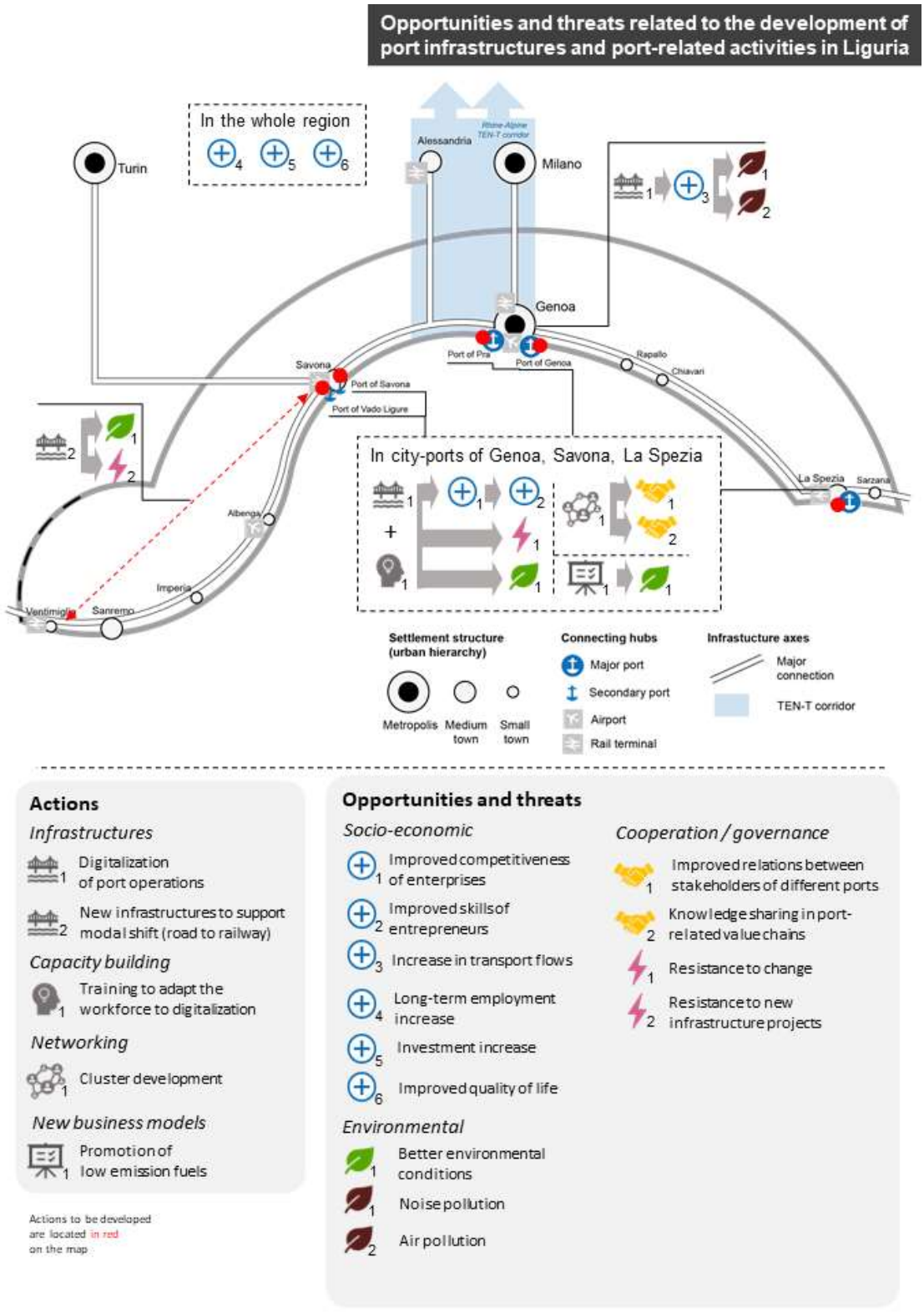


Figure 3–3 Importance of different trends in Western Liguria

In the field of 'innovation and digitalisation', an important strategic instrument is the regional strategy for smart specialisation. It aims at developing, inter alia, maritime technologies and innovative solutions for shipbuilding, naval repair, boating and refitting, including materials and components, energy efficiency, environmental impact reduction, safety and e-maritime solutions. In addition, the region has pushed the development of industry 4.0. Related activities could contribute to the development of an integrated ecosystem of innovation. With a specific focus on digitalisation, the ports work on digital port community systems (PCS) and data exchange so to optimise the access to the port and its terminal gates. This is in line with the efforts to establish integrated Italian Port Community Systems and create e-ports as important nodes of the national logistics platform.

With regard to the 'enhancement of sustainability', the 'Liguria 2022' initiative developed a model to think about sustainability from an integrated perspective and address issues related to sustainability more strategically. This model can be applied in various contexts which are relevant for future port development such as urban planning and urban regeneration, the promotion of smart and green ports and the enhancement of the blue economy in the region. The model is embedded in the wider political context of the sustainable development goals (SDG). At national level, the 'National Strategy for Sustainable Development' is in place. It consists of five key principles – the so-called 5Ps: People, Planet, Prosperity, Peace, Partnership, which shall help in achieving and implementing the SDGs in Italy.

Besides overarching trends that are relevant for future development perspectives of the urban-maritime region, various ongoing and planned port-related activities imply a range of opportunities and challenges for the urban-maritime region in western Liguria (



Map 3–4).

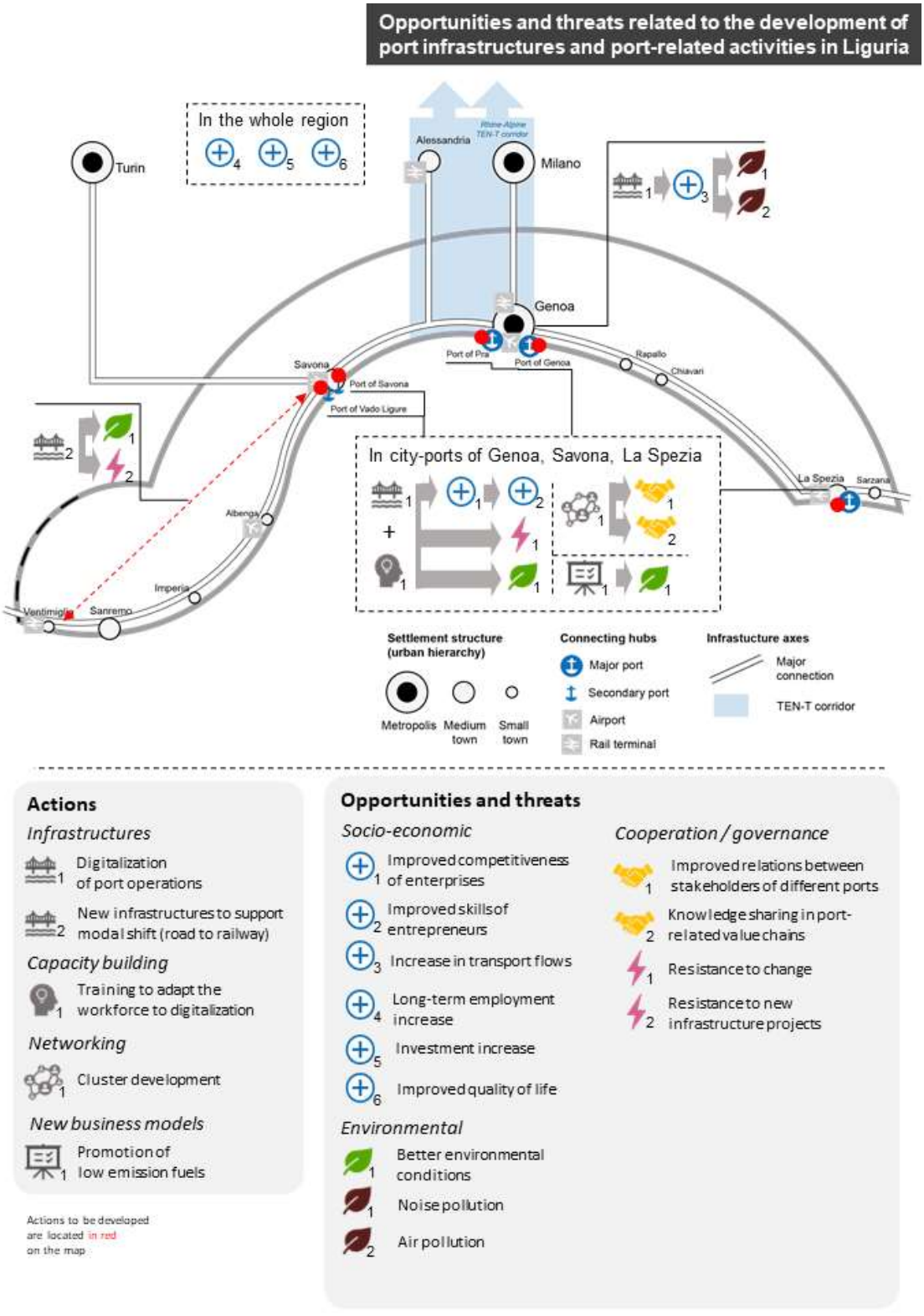
In the field of infrastructure, important developments refer to digital infrastructures and modal shift from road to rail. With regard to the first, the digitalisation of port operations in the port and

surrounding logistics facilities might be used to increase the competitiveness and attract labour force. As it contributes to more efficient transport flows, it might reduce inefficient transport flows. The other side of the coin of digitalisation is that more efficient handling of transport flows can induce new transport flows. This would imply negative effects especially for urban areas, for example through additional noise and air pollution. This negative impact could be reduced through less environmentally harmful fuels. With a particular focus on the modal shift from road to rail, the overall negative impact of rail transport is lower than for road transport. However, local resistance to upgrades of railway infrastructure and the long-term horizons of infrastructure projects might increase the pressure on both businesses and local citizens, and test their patience.

In the field of capacity building, an important action refers to training offerings so to prepare the workforce for new requirements along the whole transport chain, from lorry and port operators to logistic and shipping companies. These actors must consider changes in port operations that are relevant for their specific field of activity. Digitalisation facilitates port operations but also requires employees to be fit for the new systems. Skilled labour force can increase the overall competitiveness of all enterprises and the entire port system. Nevertheless, some players might resist to adjust their business models change their well-established routines. Some competitors might even feel that their field of business activity erodes.

In the field of networking, each Ligurian port region demonstrates a high concentration of business, port facilities and other relevant players. Still, given the number and intensity of future challenges, there is a need to strengthen cooperation across the different places and tackle shared challenges conjointly. Closer collaboration could result in the establishment of a cluster organisation that brings together players from different fields, help them to define and achieve joint goals. Such an organisation can also be used as a platform for knowledge sharing and promoting synergies across the port regions.

As a result of ongoing changes, a need for new business models can be defined. In the future, it will become even more important to combine economic and environmental objectives. More specific examples refer to the use of alternative fuels and the shift from road to rail. If real change can be achieved in limiting various emissions in the port region, this would contribute to better environmental conditions and higher quality of life.



Map 3–4 Opportunities and threats related to the development of port infrastructures and port-related activities in Liguria

Based on the presented opportunities and threats that result from port-related actions, a series of cross-cutting recommendations can be derived. They can be structured along the following two main fields (

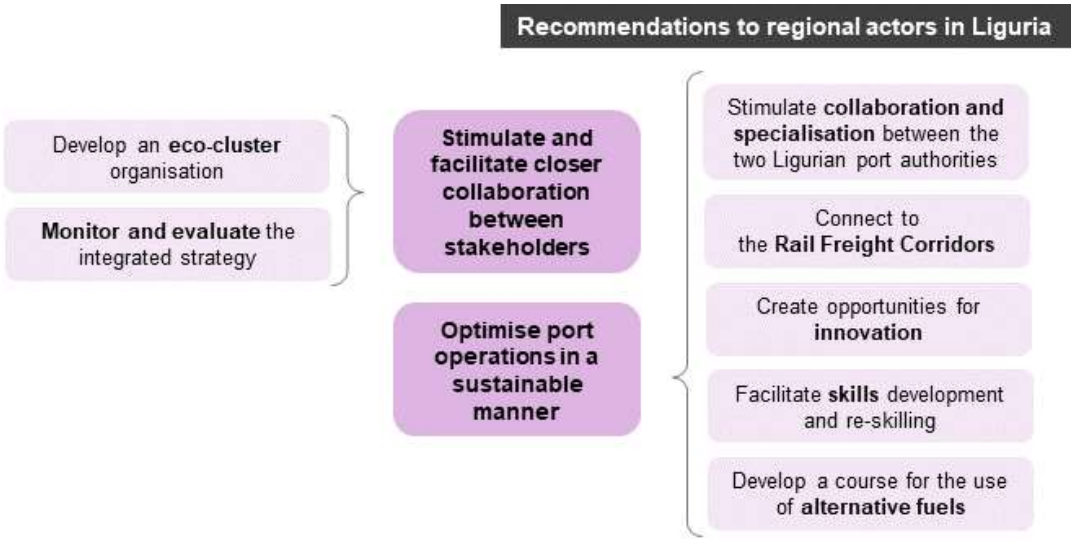


Figure 3–4).

1) Stimulate and facilitate cluster collaboration

As a starting point an eco-cluster organisation should stimulate and prepare the implementation of an integrated and sustainable strategy. While all regional actors recognise the need for sustainable growth, there is so far no coherent approach for joint action. An eco-cluster organisation could create the necessary framework for action. It should bring together port authorities, industries, universities and local and regional governments. A strong emphasis on actors from local and regional levels is an important success factor for the smooth functioning. Associations should be involved as intermediaries.

A second starting point in this main field refers to a joint and effective monitoring of the implementation of related activities. To bring the intended benefits, permanent guidance and monitoring are needed. Whenever necessary, the actions as means to the end of more sustainability can be aligned with the actors' priorities and available resources. Regular dialogue between all involved actors is an important success factor in this regard. The eco-cluster organisation could offer such a platform for exchange.

2) Optimise port operations in a sustainable manner

Closer collaboration and specialisation of the two Ligurian port authorities could lead to synergies through economies of scale and increase the strategic perspective for each port authority. Regular dialogues at strategic level on topics that are relevant for all ports could be first step in this direction. To avoid interference with the competition between the two port authorities, shared challenges such as sustainability or hinterland connections could be addressed first.

The two ports are connected to two Rail Freight Corridors (Western Liguria: Rhine-Alpine; Eastern Liguria: Scandinavia-Mediterranean). To promote intermodality, hinterland connectivity

and interoperability from an integrated perspective, each port authority should be connected to both corridors.

Innovation is an important success factor for successful urban-maritime eco-systems. Various excellent universities as well as research-intensive private companies are located in Liguria. They should be invited to contribute to the abovementioned strategy. Opportunities for collaboration between private companies, academia and the public sector should be identified and exploited. EU funding opportunities could be used as financial means to support such collaborations.

Port development underlies constant change which also brings about new requirements for workers. Training offerings and opportunities for re-skilling and gaining knowledge are essential to ensure that workers are capable to adapt to future requirements and actively contribute to change. The eco-cluster organisation should be involved in developing, offering and facilitating such training programmes.

Alternative fuels are a key element for more sustainable port development. This transition underlies uncertainty because technological solutions are not fully available yet. In addition, investments costs are high. Existing facilities need to be upgraded and new facilities need to be built. To ensure that the transition can happen in an effective and efficient way, all actors need to join forces. A joint course for the use of alternative fuels is needed, also supported at EU level, so to align efforts across Europe and ensure a consistent implementation process.

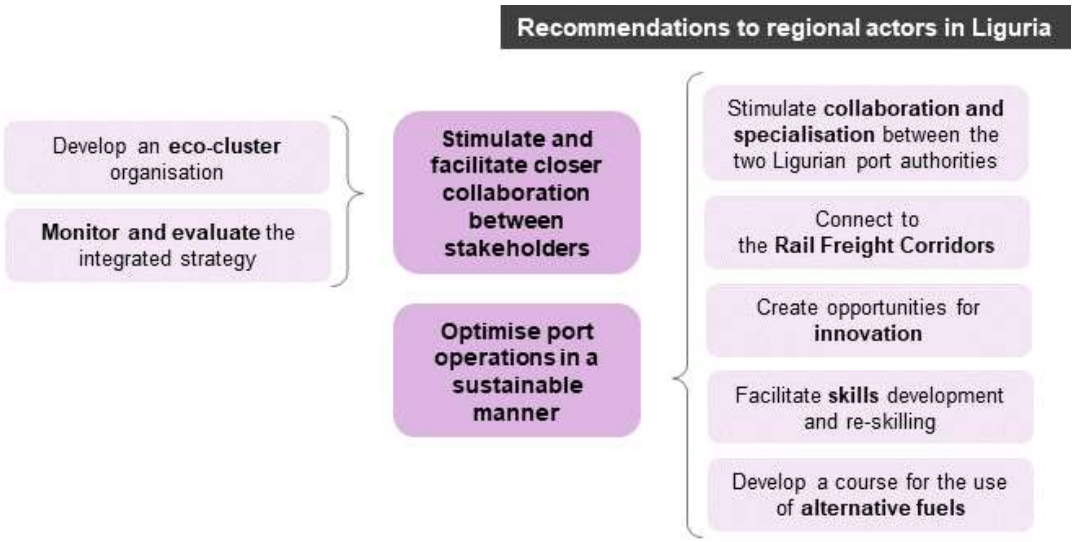


Figure 3–4 Recommendations to regional actors in Liguria

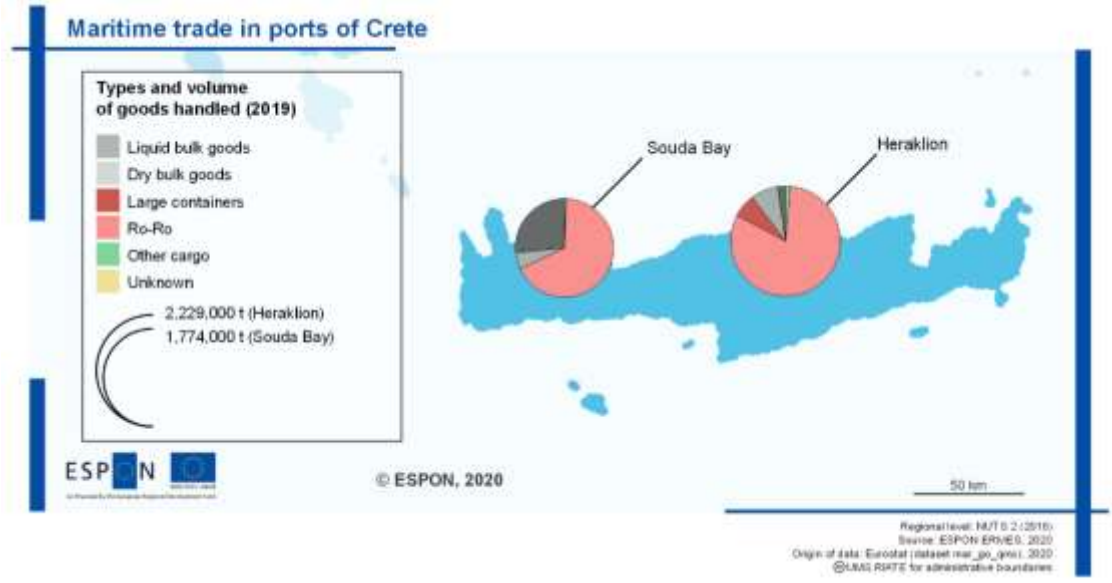
4 The urban-maritime region on Crete

To provide a comprehensive overview, the following starts with a description of the current situation in the urban-maritime region of Crete, followed by an outlook into relevant trends, opportunities and threats relevant for future development and recommendations.

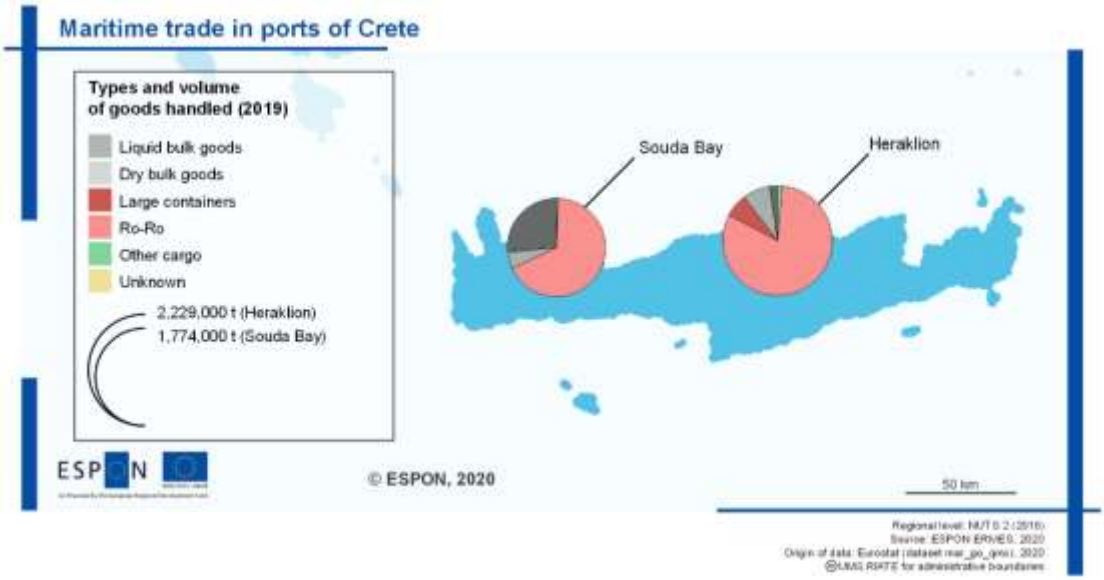
4.1 Present situation

Port infrastructures play an important role for most Greek regions. As a country with a maritime tradition, a long coastline and an enormous number of bigger and smaller islands in the Aegean and the Ionian Sea, ports are important infrastructures to ensure connectivity at regional as well as national level. Due to its strategic position as the first EU member state in the eastern Mediterranean Sea reached by ships after passing through the Suez Canal, some Greek ports also play an important role in international and global transport chains. The five largest Greek ports of Piraeus, Agioi Theodoroi, Elefsina, Thessaloniki and Megara have a total cargo volume of almost 120 million tonnes. While the largest port of Piraeus has a strong focus on container transport (47 million tonnes; 88 % of its total cargo volume), the other four ports mainly handle liquid bulk goods (57 million tonnes; 83 % of their joint cargo volume). Agioi Theodoroi as the second largest Greek port (26 million tonnes) handles only liquid bulk goods. On the other side, the port of Thessaloniki has a more balanced profile. Besides liquid bulk goods (47 %), container transport (26 %) and dry bulk (24 %) also play a role.

With a particular focus on Crete, the island ports are important gateways for passenger and freight transport between Crete, the mainland and other Greek islands. The main ports are Heraklion and Souda Bay with a total cargo of about 4 million tonnes. For both ports, roll-on/roll-off transport accounts for the largest share of 67 % (Souda Bay) and, respectively, 81 % (Heraklion). While container transport (7 %) and dry bulk (8 %) are other relevant types of goods for the port Heraklion, the port of Souda Bay specialised in handling liquid bulk goods, which account for more than one quarter (27 %) of its total freight volume (



Map 4–*1*).

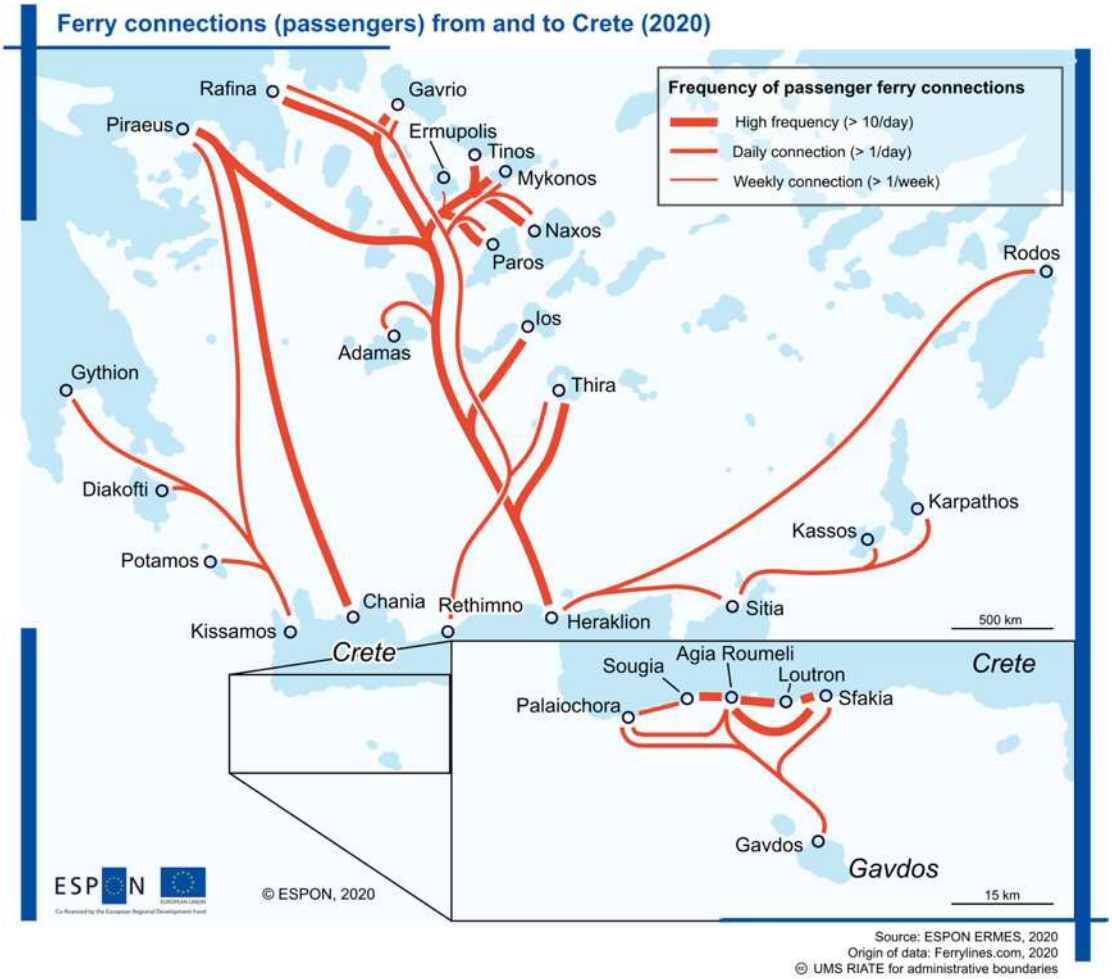


Map 4–1 Maritime trade in ports of Crete (2019)

With about 73 million seaborne passengers, Greece is one of the leading seaborne passenger countries in Europe, which makes the eastern Mediterranean Sea one of the main hotspots of passenger transport. Fully in line with the overall importance of passenger transport in Greece, Crete has various ports which offer a multitude of connections between Crete, the Greek mainland and other Greek islands (Map 4–2). In addition, ferry lines are operated between different Cretan ports – for example between Heraklion and Sitia or between Palaiochora, Sougia, Agia Roumeli, Loutron and Sfakia.

Most frequent ferry connections between Crete and the mainland are operated from the ports of Heraklion and Chania (more than ten times per day). Ferries from these ports connect Crete to Piraeus and Rafina. Additional, yet less frequent, mainland ferries operate between Kissamos and Gythion, respectively, as well as between Rethimno and Rafina.

The main port to connect Crete and other Aegean islands is Heraklion. Daily connections are offered to Thira, Ios, Paros, Naxos, Adamas, Tinos, Mykonos, Gavrio, and Rodos. Other ports have a clearer focus like Kissamos on Potamos and Diafkoti in the western Aegean Sea, and Sitia on Kassos and Karpathos in the eastern Aegean Sea.

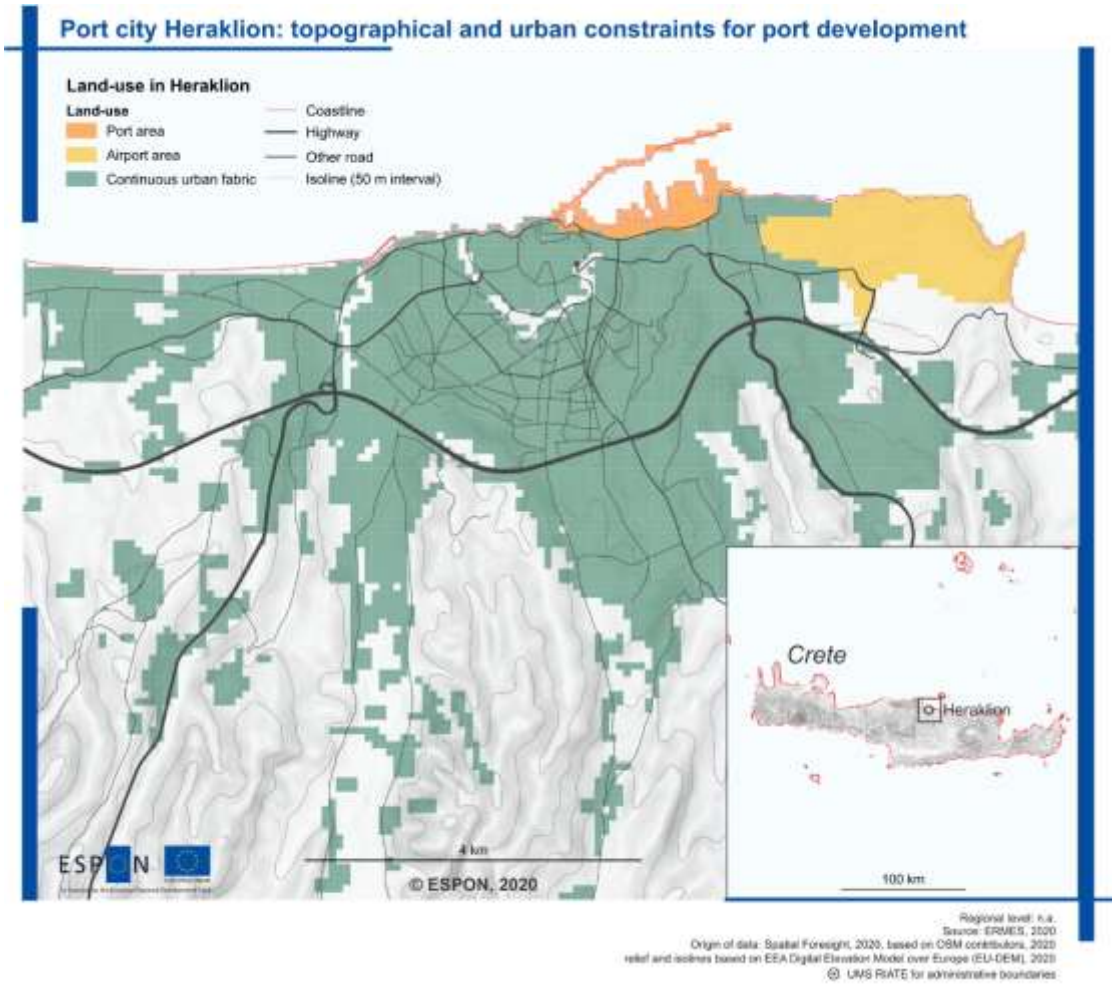


Map 4–2 Ferry connections (passengers) from and to Crete (2020)

The main port infrastructures of the port of Heraklion are concentrated on a comparatively small area which is located along the shoreline of the city of Heraklion (*Map 4–3*). The embeddedness of the port area in the urban fabric of Heraklion and the close vicinity of residential neighbourhoods and business areas to the port limit the area available for future development perspectives.

Another important constraint for future urban development results from the mountainous hinterland of the city. In addition, Crete's insular character has impacts on the development perspectives of the island because it implies rather low accessibility to European markets as well as high dependency on external transport linkages by air and sea.

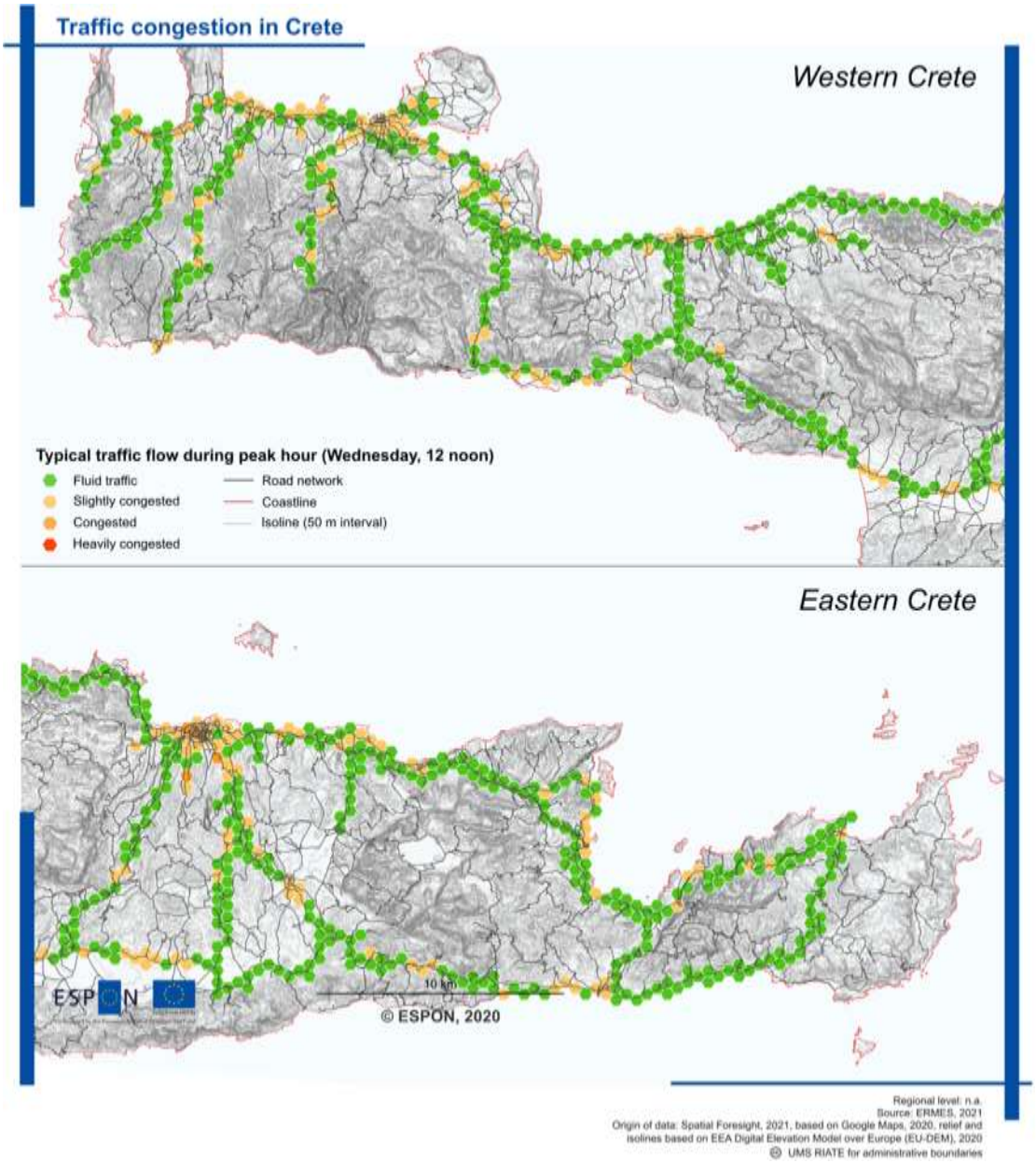
With regard to policy design and delivery, Crete depends on the capacity and willingness of national authorities on the Greek mainland to take account of the island's specific needs and integrate them into national policies and overarching infrastructure networks. A relevant example is the TEN-T network to which Crete as an island is only connected through the Motorways of the Sea.



Map 4–3 Port city of Heraklion: topographical and urban constraints for port development

Traffic congestion is an issue for the development of the port as a multimodal logistic hub. It extends time spent in road transportation for daily commuters and tourists. It also creates uncertainties of the on-time deliveries for goods leaving from and arriving in Crete through the ports. Furthermore, it is a threat to air quality in cities and along the main transportation axes. It is therefore a major issue in relation to the future development of the port of Heraklion.

At the highest peak hour during the week (Wednesday, 12:00, according to Google Maps), most congested points are located in the centre of main cities (Heraklion and Chania), at some access point to Heraklion (from and to cities of the southern coast), and on roads along the Northern coastal strip in Kissamos, Platanias and Kalivès (near Chania), Pigianos Kampos (near Rethymno) and Malia (*Map 4–4*). Seamless connections between the main transport interfaces and access from the Cretan hinterland are key factors for the efficiency of multimodal transport from/to and on Crete.



Map 4–4 Traffic congestion in Crete

The political-administrative context provides the overall framework in which all port development activities are embedded. It consists of different levels, from local to national level (Figure 4–1). All these levels influence the future of port development. The embeddedness is clearly divided vertically. The Heraklion Port Authority is located within the municipality of Heraklion, which is part of Crete Region. No significant reforms were implemented in the recent past. The port authority is currently owned by the Greek state, with the share capital owned by the Hellenic Republic Asset Development Fund (HRADF). However, in 2020 HRADF announced that it will sell the majority of its shares in the port as a part of a larger privatisation programme of Greek regional ports.

Figure 4–1 Political-administrative context of the port of Heraklion

Within this overall context, a variety of different players work on port development in the urban-maritime region. A distinction of players can be made based on two key features. First, a focus on public or private interests and the ownership structure and, second, the thematic focus and sector orientation (i.e. port operations and development, spatial planning and land use, business development and industries, research). Local and regional authorities as well as national ministries form the core of relevant actors (*Figure 4–2*).

In the fields of business / industries and research, a variety of public-private and private actors is active, including chambers of commerce, ferry operators and universities. The Heraklion Port Authority in charge of port operations and port development is currently a public-private actor. It is owned by the Greek state and supervised by the Ministry of Shipping and the Aegean.

The diversity and complexity of actors implies, inter alia, diverging interests that need to be coordinated from an overarching perspective aiming for balanced spatial development in the urban-maritime region around Heraklion.

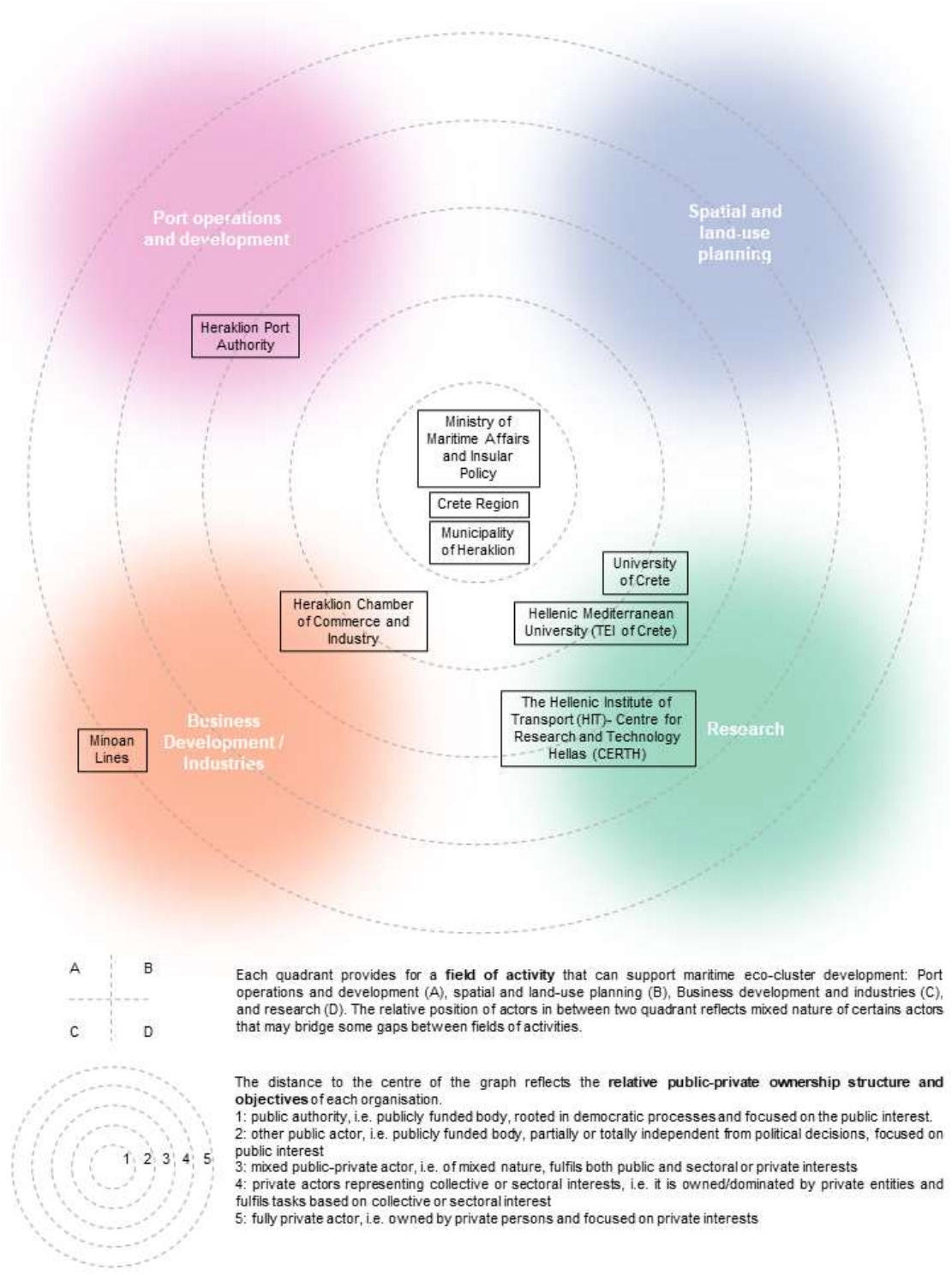


Figure 4–2 Overview of actors relevant for port development in the port of Heraklion

4.2 Future perspectives

The port of Heraklion shall be transformed into a ‘smart port’. Related efforts may contribute to cross-border trade, seamless connections for freight transport and more cooperation. Consequently, especially trends related to ‘innovation and digitalisation’ (fully shaded – in blue) and, to a lesser extent, trends in the field of ‘optimisation of port operations’ (partially shaded – in red) are of importance for future development perspectives of the port (Figure 4–3).

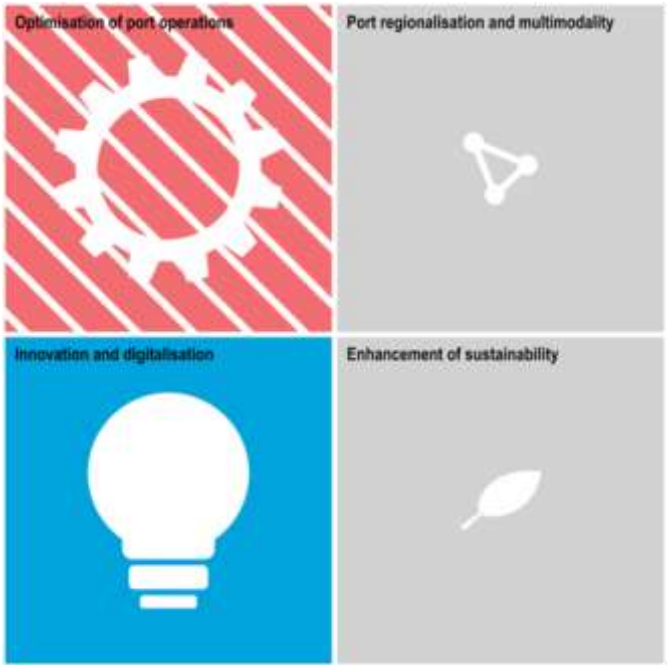


Figure 4–3 Importance of different trends on Crete

In the field of ‘innovation and digitalisation’, the Smart Specialisation Strategy for Crete is a key policy instrument which aims at shaping future regional development and enhancing regional competitiveness. Although the strategy does not specifically address the port, it puts emphasis on several relevant topics such as productive maritime economic activities, the role of research, innovation and entrepreneurship and collaboration within clusters. With particular focus on the field of digitalisation, the Heraklion Smart City project is an important initiative inter alia aiming for cooperative transport systems in freight transport. Close collaboration between economic actors and the research community is an important means in this regard.

In the field of ‘optimisation of port operations’, the masterplan of the port authority is an important concept. The recent version includes various proposals on how to improve traffic connections and modernise transport. Several activities have lately been implemented. Among these are the Blue Hubs and Poseidon MED II projects which aim to improve access to liquified (LNG) and compressed natural gas (CNG) as well as different road projects aiming at improving hinterland connections, maritime connectivity and multimodality.

An important additional trend which is relevant for many Greek islands refers to the dependence of local economic development on tourism. The Smart Specialisation Strategy includes proposals to use science, innovation and information and communication technologies (ICT) to develop comparative advantages and boost competitiveness. Specific measures refer to upgrades of cruise infrastructures, sustainable transport in tourist areas and designing new tourism services and offerings. Sustainable tourism is of particular emphasis in the current partnership of the port of Heraklion, the Global Sustainable Tourism Council (GSTC) and the Cruise Lines International Association (CLIA).

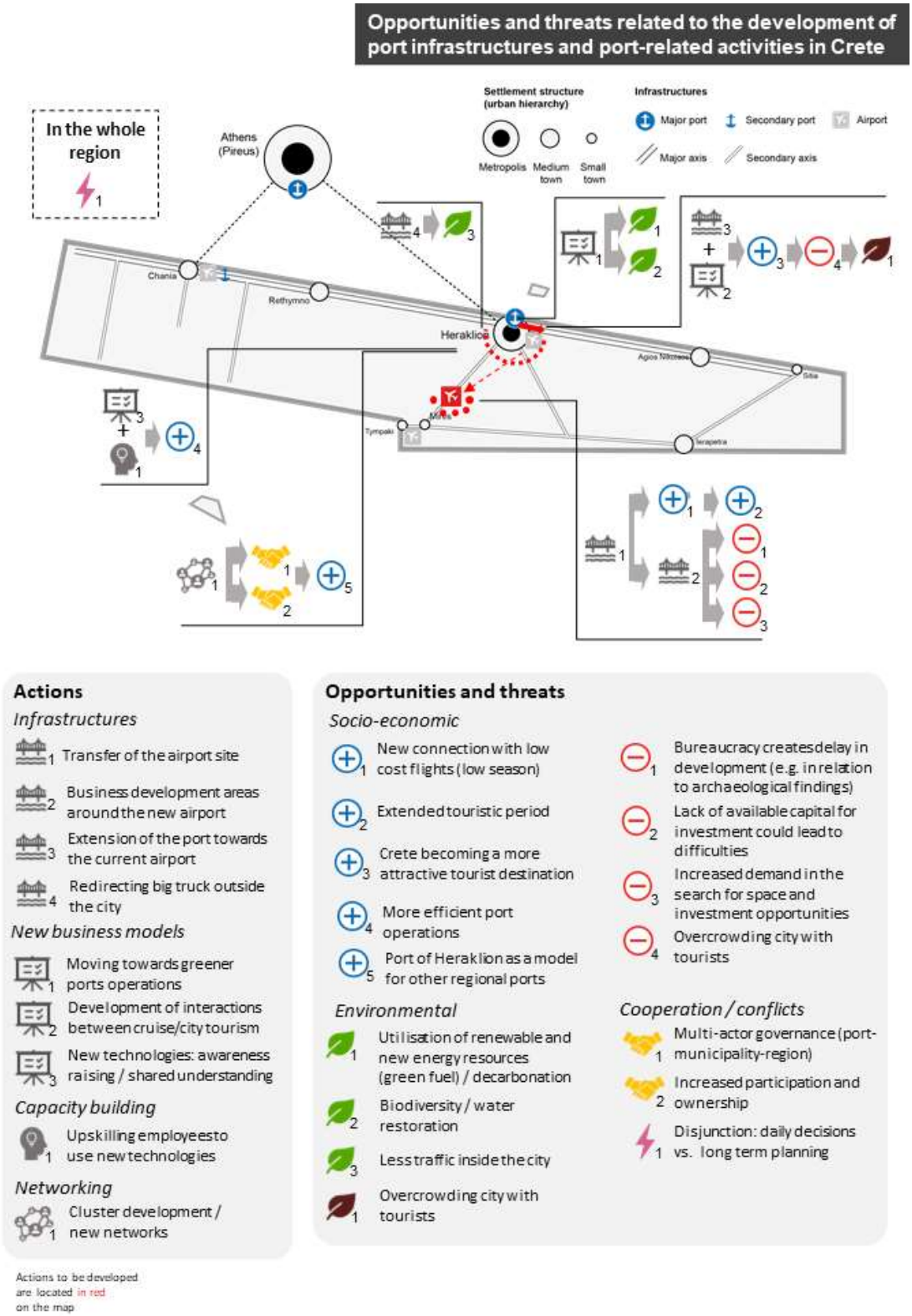
Besides overarching trends that are relevant for future development perspectives of the urban-maritime region, various ongoing and planned port-related activities imply a range of opportunities and challenges for the urban-maritime region on Crete (*Map 4–5*).

In the field of infrastructure, various activities link the port development to the site of the nearby airport. If a new airport will be developed, Cretan tourism could benefit from new connections and an extended tourist season beyond high season. In addition, new business areas could be developed around the new airport. However, bureaucracy in the context of archaeological findings, insufficient financial capital and the high demand for available land-use could lead to considerable delays. If the port can be extended towards the current airport site, this could allow for more synergies between cruise and city tourism. It would provide the opportunity for Crete to become a more attractive tourist destination. However, excessive tourism may also increase the social and environmental pressure on Crete.

In the field of new business models, developing a greener port is an important factor for developing synergies between port operations and tourism. Related activities have direct positive environmental effects and might contribute to better biodiversity and water quality. An important step in this direction lies in increased utilisation of renewable energy resources and other measures that support decarbonisation efforts. Besides environmental efforts, also new technologies offer opportunities for new business models. Especially the combination of new technologies and training measures aiming at capacity building such as upskilling employees to make them fit for adopting new technologies, might lead to more efficient port operations, once the technologies are more widely applied.

In the field of networking activities, the development of clusters offers opportunities to bring various players together and promote multi-actor governance arrangements between the port, infrastructure operators, local and regional public authorities and other relevant players. This might lead to more participatory and inclusive port development and greater ownership among local citizens.

Overall, whether the port and port-related businesses benefit from all the opportunities identified above (and to what extent) depends on two key perspectives. On the one hand, it depends on the alignment between strategic decision and long-term planning, and on the other hand it depends on the operational activities and daily decisions. Both perspectives are needed to fully exploit the opportunities and, at the same time, tackle related challenges.



Map 4–5 Opportunities and threats related to the development of port infrastructures and port-related activities on Crete

Based on the presented opportunities and threats that result from port-related actions, a series of cross-cutting recommendations can be derived. They can be structured along the following three main fields (*Figure 4–4*).

1) Transform the port of Heraklion into a maritime transport and tourism hub

A comprehensive roadmap for sustainable port development should be elaborated. It should seek to integrate port, economic, environmental and social development and combine these elements with the port master plan. Such a roadmap needs a clear strategic focus and strong commitment among all involved players. It should also include a clear management and governance structure as well as a monitoring system.

All relevant decision-makers need to be involved in the transformation process. A strong and participatory governance arrangement would foster communication and exchange and, thus, contribute to transparency and support ownership. This includes regularly updates about progress and delay in ongoing activities. Lessons from previous experience in the field of stakeholder cooperation should be utilised in this regard.

A third important element refers to developing a functional, well-designed cluster that brings together a local and regional perspective. A multi-actor approach involving port authorities, local and regional governments, academia, chambers of commerce, businesses, port operators, service providers and tourism-related enterprises should conjointly work on common goals and commit to minimising the spread of misinformation, reducing local bureaucracy and exchange experience to share the burden of national and EU bureaucracy. Such a cluster can also contribute to integrated regional development. Effective and efficient management structures and a clear division of roles and responsibilities are key for the success of the cluster.

Finally, financing opportunities need to be identified so to ensure that the envisaged activities are implemented and the potential is fully explored. In general, the thematic focus of the activities is line with the priorities of the next EU multi-annual financial framework 2021-2027. Other EU funding sources such as the Connecting Europe Facility could be used for financing port-related measures. The new Invest EU instrument can also be used for measures in the field of infrastructure, innovation and digitalisation. Relevant information should be prepared and made available to interested local and regional players in due time before the first calls are opened.

2) Steer the "Smart" Tourism Development

The port of Heraklion is currently working with the Global Sustainable Tourism Council (GSTC) and other stakeholders to ensure the sustainable return of tourism to the destination. The region can also learn from existing best practices in Smart Tourism as well as from other Mediterranean destinations such as Venice and Dubrovnik, on how to address and prevent over-tourism associated with cruise traffic. The municipality of Heraklion, together with the port authority should take the lead, in close communication with the local community and businesses, to implement appropriate measures for the benefit of local citizens.

3) Encourage sustainability efforts in the region

A wide range of local, regional and national plans and projects exist, all of which aim for more sustainability, such as the Heraklion Smart City project, the plan for sustainable tourism in Heraklion, the National Energy and Climate Plan, the National Circular Economy Strategy, and the National Transport Plan. Altogether, they establish the strategic framework for related activities. However, they are not harmonised and complementary but rather lead to overlapping and inefficient implementation. An integrated overview of all strategies and activities would be a first step towards better coordination. Based on this, a clear vision needs to be developed to describe the shared understanding of a desirable future or the wider region. This vision should also include concrete steps on how to reach the vision. This could be supported through a budget and timeframe for the implementation process.

Another important aspect with regard to sustainability efforts is a strict monitoring system so to follow the implementation process and assess the progress. Already in the development stage, the responsibilities need to be clearly assigned, together with transparent measures to be taken in the event of delays or necessary changes. The port authority should play a strong role in developing and running such a monitoring system.

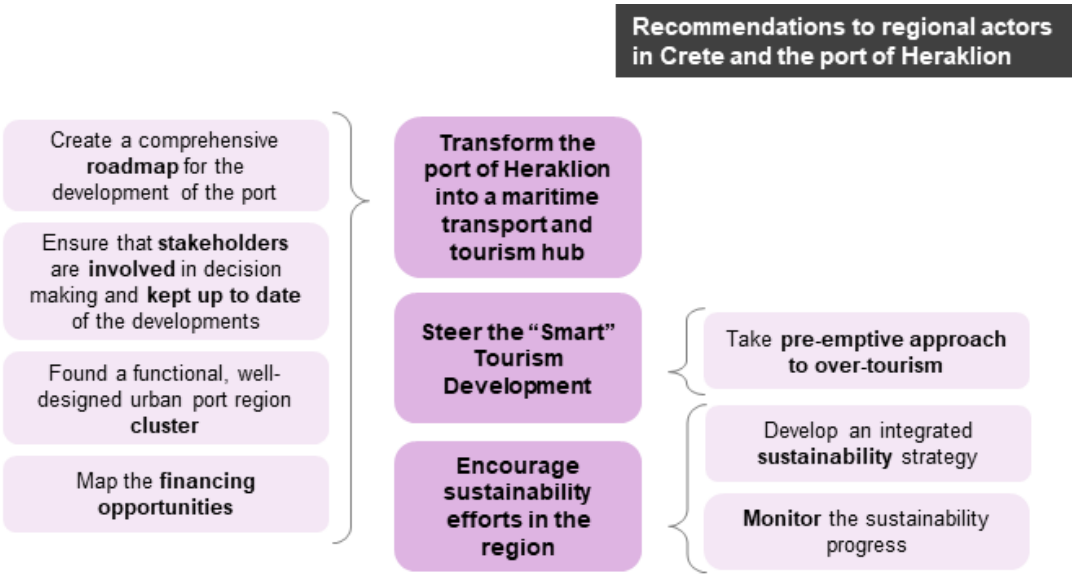


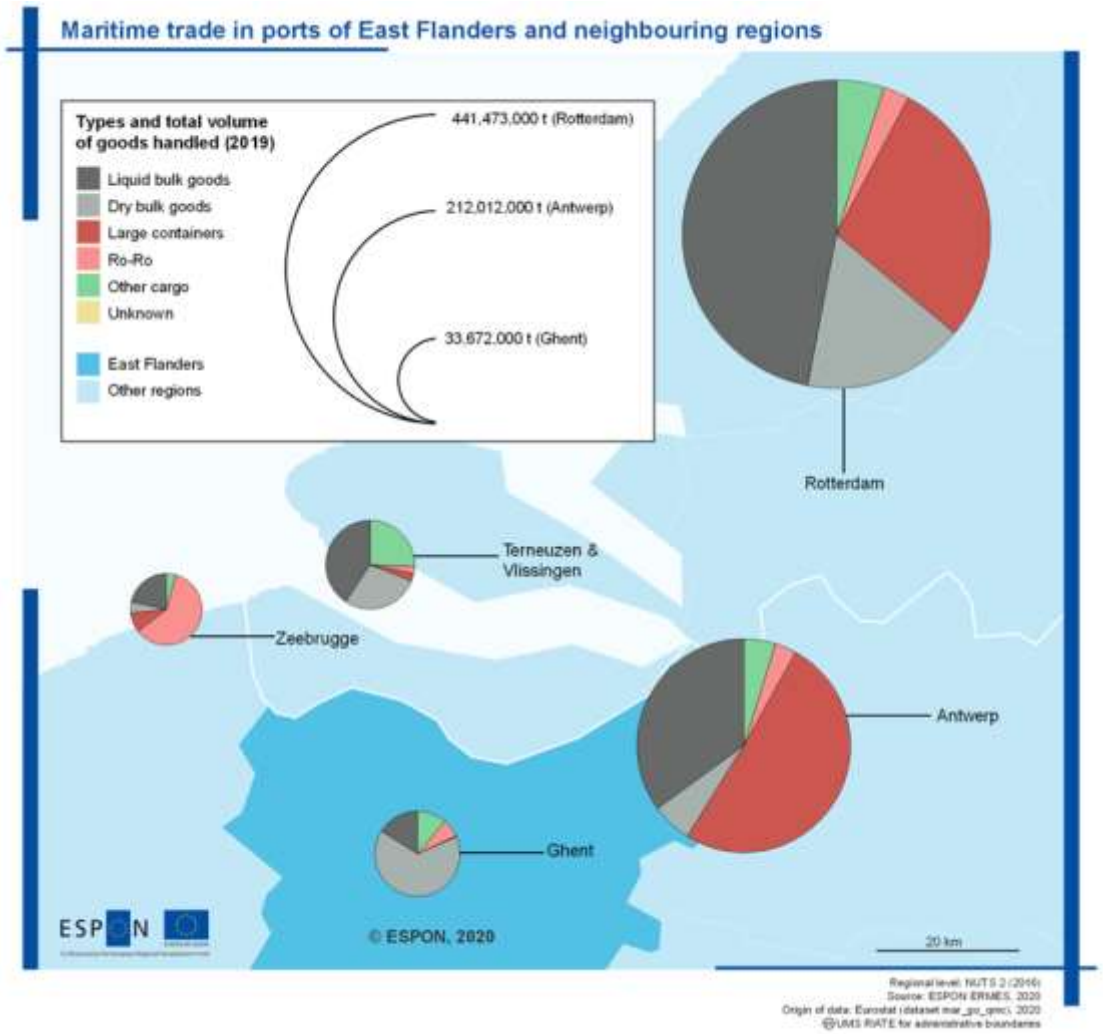
Figure 4–4 Recommendations to regional actors in Crete and the port of Heraklion

5 The urban-maritime region in East Flanders

To provide a comprehensive overview, the following starts with a description of the current situation in the urban-maritime region of East Flanders, followed by an outlook into relevant trends, opportunities and threats relevant for future development and recommendations.

5.1 Present situation

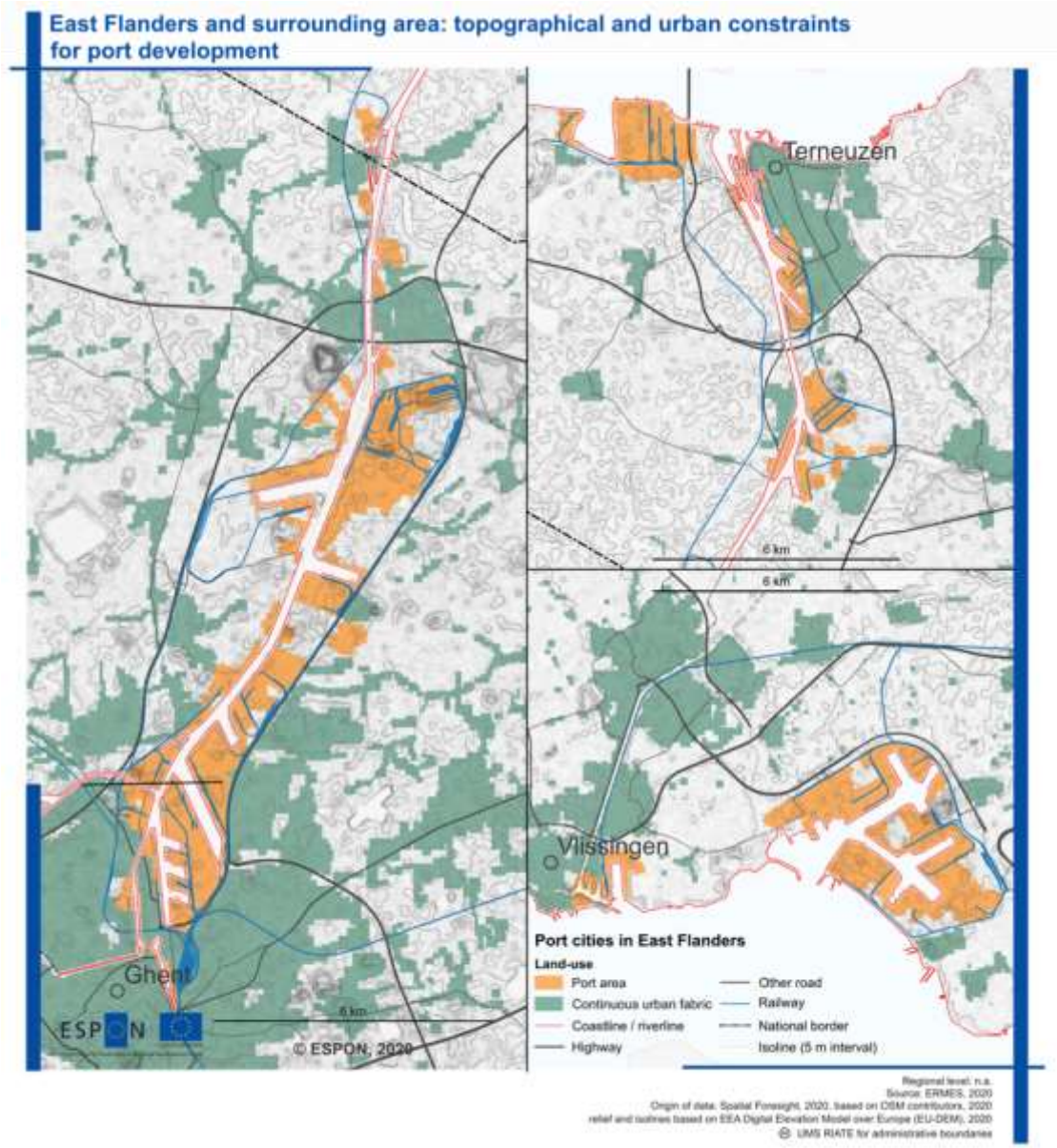
Belgian and Dutch ports are among the most important ports in global freight transport. Liquid bulk and container transport account for the highest shares in the ports of Rotterdam (440 million tonnes) and Antwerp (210 million tonnes) (*Map 5–1*). While the port of Antwerp focuses on container transport (51 %), the port of Rotterdam transports more liquid bulk (47 %) than Antwerp (35 %). A few smaller ports complement the portfolio of the big players. Similar to Rotterdam, the Dutch ports of Terneuzen/Vlissingen (37 million tonnes) mainly depend on liquid (41 %) and dry bulk (28 %). Other ports focus on specific types of goods. While the port of Ghent (34 million tonnes) has a strong focus on dry bulk (65 %), the port of Zeebrugge (24 million tonnes) specialised in roll-on/roll-off transport (60 %). Due to their size, the major ports still dominate the overall pattern in freight transport in the wider region.



Map 5–1 Maritime trade in ports of East Flanders and neighbouring regions (2019)

Due to the flat landscape, the ports in East Flanders and Zeeland which form the North Sea Port have few topographical constraints for future development perspectives. Still, constraints for port development differ between the ports. The port areas around Ghent are located along the Ghent-Terneuzen Canal with considerable port areas in the main settlement area of Ghent (*Map 5–2*). Main development areas are therefore located outside of the main settlement area.

In contrast to the port areas around Ghent in Belgium, the Dutch ports of Terneuzen and Vlissingen are directly located at the Scheldt river. Main port areas around Terneuzen are located close to residential and business neighbourhoods. However, considerable port areas can also be found outside the main residential area along the shore of Scheldt river. In Vlissingen, only minor port areas are located in close vicinity to the main settlement area. Most port areas are located a few kilometres outside the main settlement area, in Vlissingen-Oost.



Map 5–2 East Flanders and surrounding area: topographical and urban constraints for port development

The political-administrative context provides the overall framework in which all port development activities are embedded. It consists of different levels, from local to national level. The special situation in East Flanders / Zeeland is the cross-border dimension which implies that players and authorities both from The Netherlands and Belgium are involved (Figure 5–1).

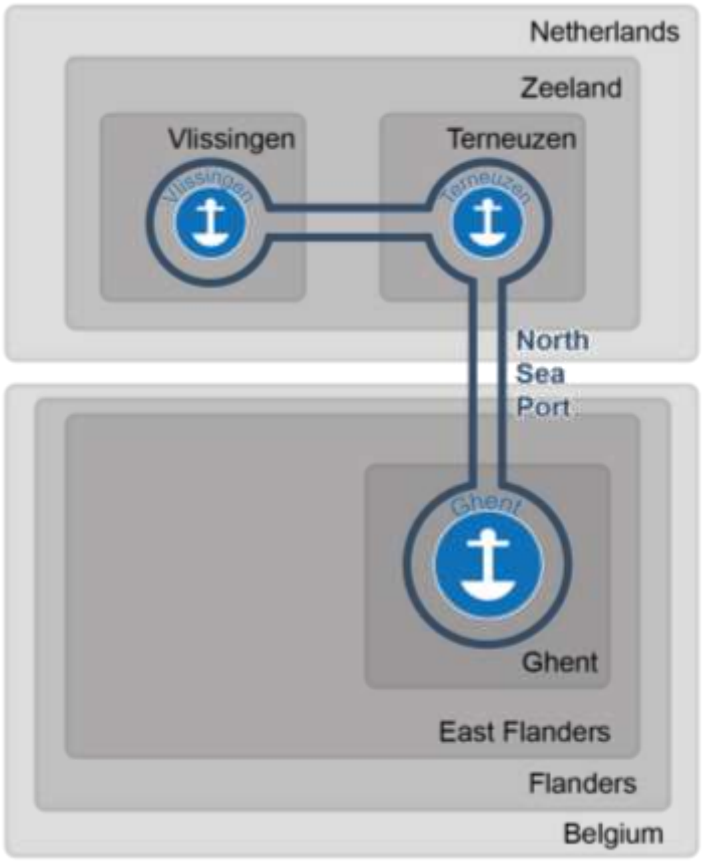


Figure 5–1 Political-administrative context for the North Sea Port

In January 2018, the Dutch seaports of Terneuzen and Vlissingen merged with the Flemish seaport of Ghent. The newly established North Sea Port has eight shareholders, all of which are public. The main shareholders are the Belgian city of Ghent (49 %), the Dutch province of Zeeland (25 %), and the Dutch municipalities of Borssele, Terneuzen and Vlissingen (8 % each). In addition, the Flemish municipalities of Evergem and Zelzate and the province of East Flanders hold minor shares (below 2 % altogether). This implies that various authorities do not only provide the overall institutional context but also influence the strategic orientation and operations implemented by the North Sea Port.

Within this overall context, a variety of different players work on the development around the North Sea Port. A distinction of players can be made based on two key features. First, a focus on public or private interests and the ownership structure and, second, the thematic focus and sector orientation (i.e. port operations and development, spatial planning and land use, business development and industries, research). Local and regional authorities as well as

national ministries form the core of relevant actors (

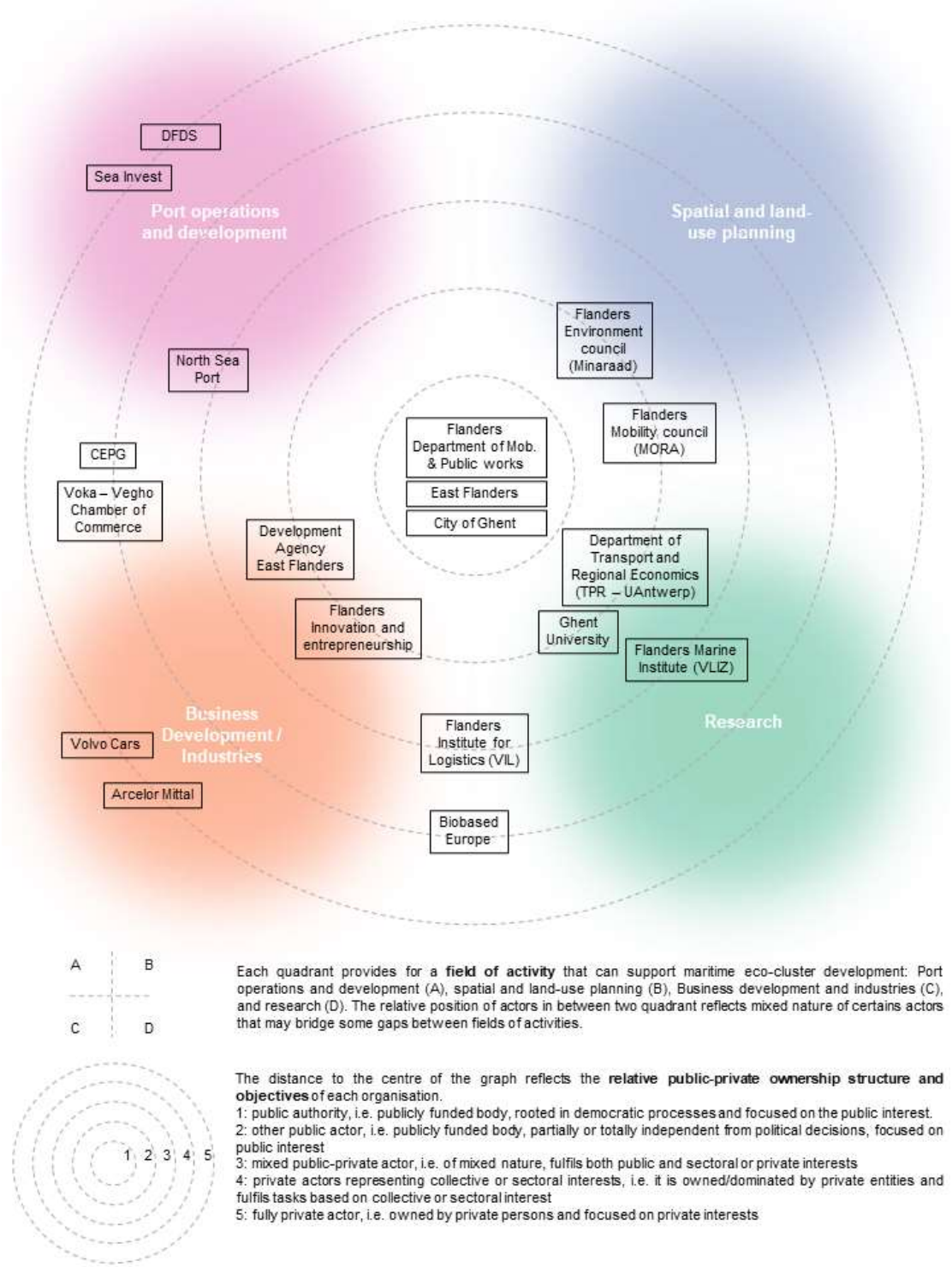


Figure 5–2). In the fields of business / industries, research, spatial planning and land-use, a variety of public and public-private actors is active, including various research institutes and agencies. Port operations, on the other hand, are mainly dominated by private enterprises. Naturally, enterprises are also important player in the field of business development and industries. This diversity and complexity of actors implies, inter alia, that diverging interests need to be coordinated from an overarching perspective especially considering the cross-border dimension of the wider Dutch-Flemish port region along the Scheldt Delta.

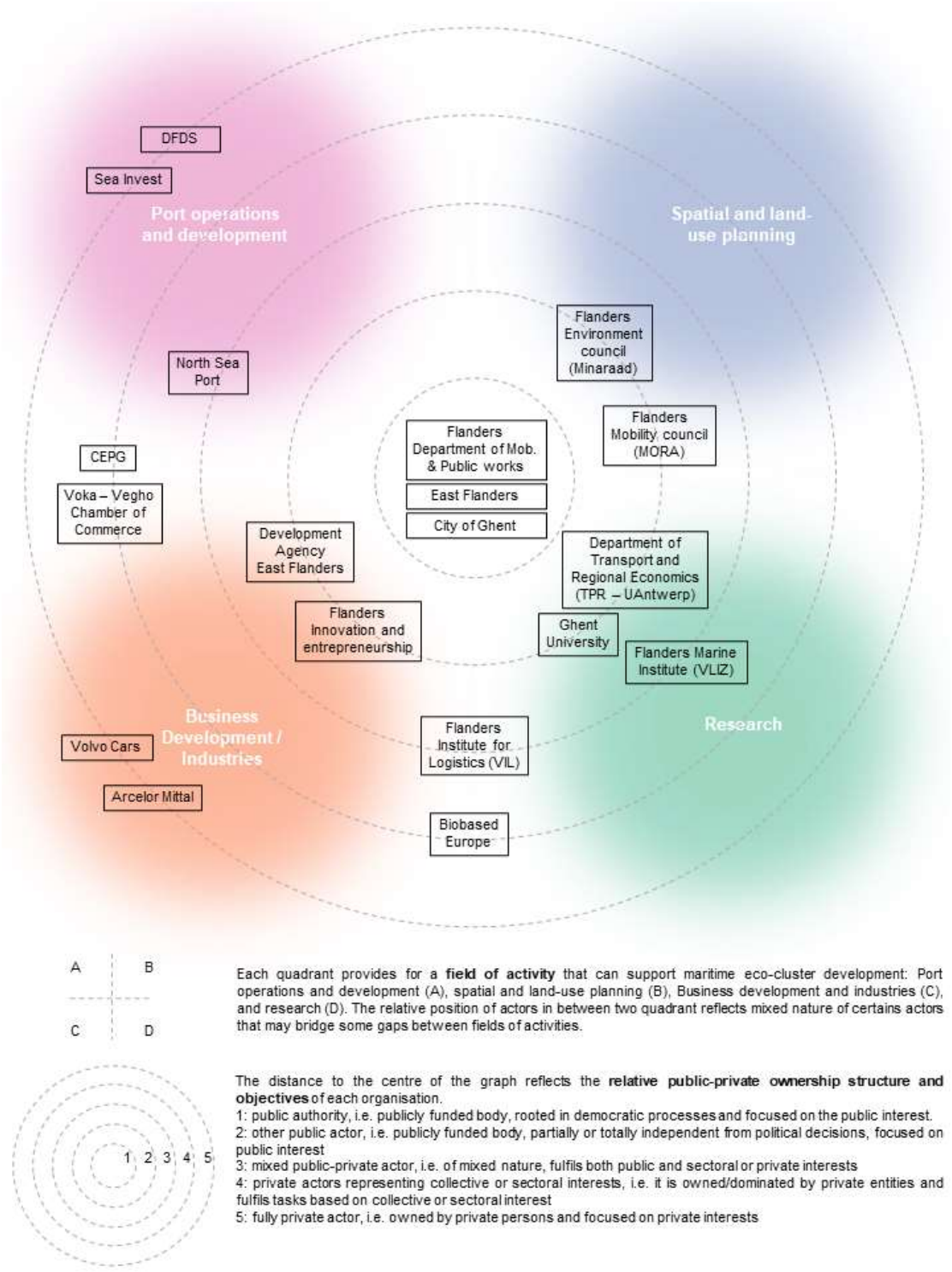


Figure 5–2 Overview of actors relevant for port development in the ports of the North Sea Port

5.2 Future perspectives

The North Sea Port describes itself as a newcomer among the leading ports in Europe. Its vision aims at enabling the region to grow in terms of sustainable economic activity with high added value. To achieve this vision, the North Sea Port seeks to provide high-quality port infrastructures and related services. Against the background of positioning the comparatively young North Sea Port, the trends of 'innovation and digitalisation' and 'enhancement of sustainability' are of major (fully shaded – in blue and in green) importance (Figure 5–3).

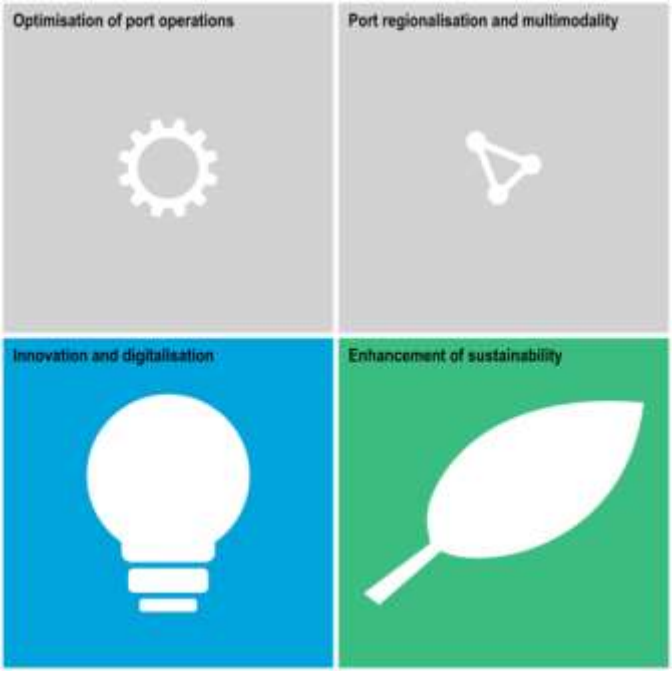


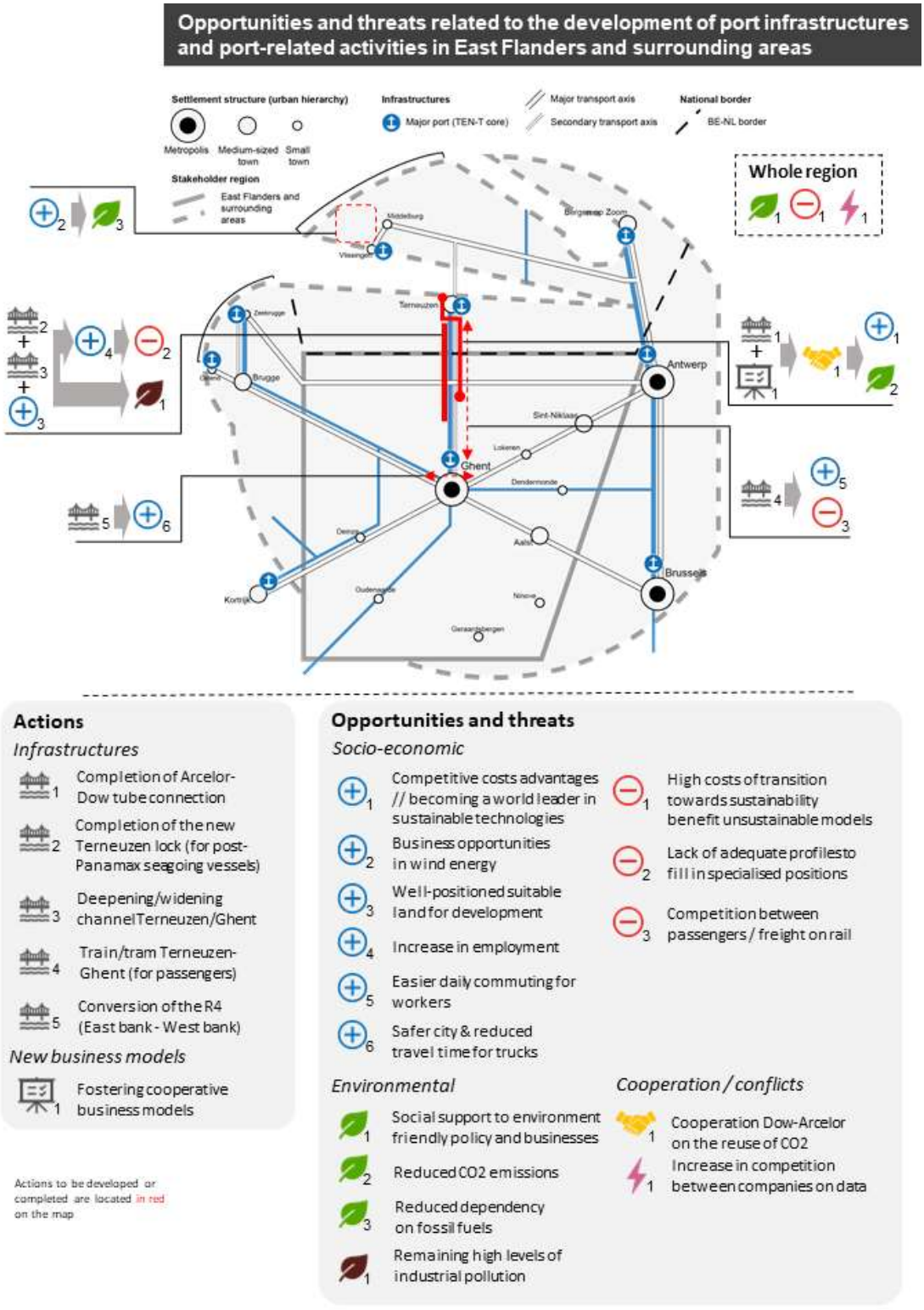
Figure 5–3 Importance of different trends in East Flanders

With regard to 'innovation and digitalisation', the smart specialisation strategy of the province of East Flanders is an instrument policy instrument. It aims at optimising regional innovation policies. Cluster activities in the fields of ICT, smart logistics and eco-innovation offer opportunities for future development in the North Sea Port. Digital platforms and ICT solutions may allow for more efficient information flows along the transport chain.

With regard to 'enhancement of sustainability', the North Sea Port committed itself to the 'sustainability ambition 2030', hereby cooperating with the Environmental Federation of Zeeland and the Province of Zeeland on the Dutch side. Related actions focus on employment, air quality, hinterland connections, green areas, energy efficiency and circular economy. At province level in Belgium, the strategy to achieve an environmentally friendly and healthy region by 2050 is an important policy instrument with a strong link to the smart specialisation strategy, for example in the fields of bio-based economy, smart logistics, eco-innovation and food systems. Efforts related to renewable energy sources from wind and solar power contribute to the transition to a carbon-neutral region.

Specific actions like the expansion of rail infrastructure, the construction of pipeline infrastructures and the promotion of inland waterway transport solutions can contribute to better hinterland connectivity and lower CO_2 emissions in the port area. This is of particular importance for the North Sea Port with its decentralised port areas at different locations in Ghent, Terneuzen and Vlissingen.

Besides the overarching trends that are relevant for future development perspectives of the urban-maritime region, various ongoing and planned port-related activities imply a range of opportunities and challenges for the urban-maritime region in East Flanders (



Map 5–3).

With regard to socio-economic impacts, the actions have various positive impacts. The development of port infrastructures and port-related activities could make the region a

frontrunner in the field of sustainable technologies, which could also result in competitive advantages. This could attract new companies and create new jobs. The most important socio-economic challenge will be the high costs that come with the climate and energy transition. And although new companies and business models generate employment, there is no guarantee that the future working force in the region has the right skills that are required. Finally, improving rail connectivity for passengers is likely to increase the pressure on railway infrastructures.

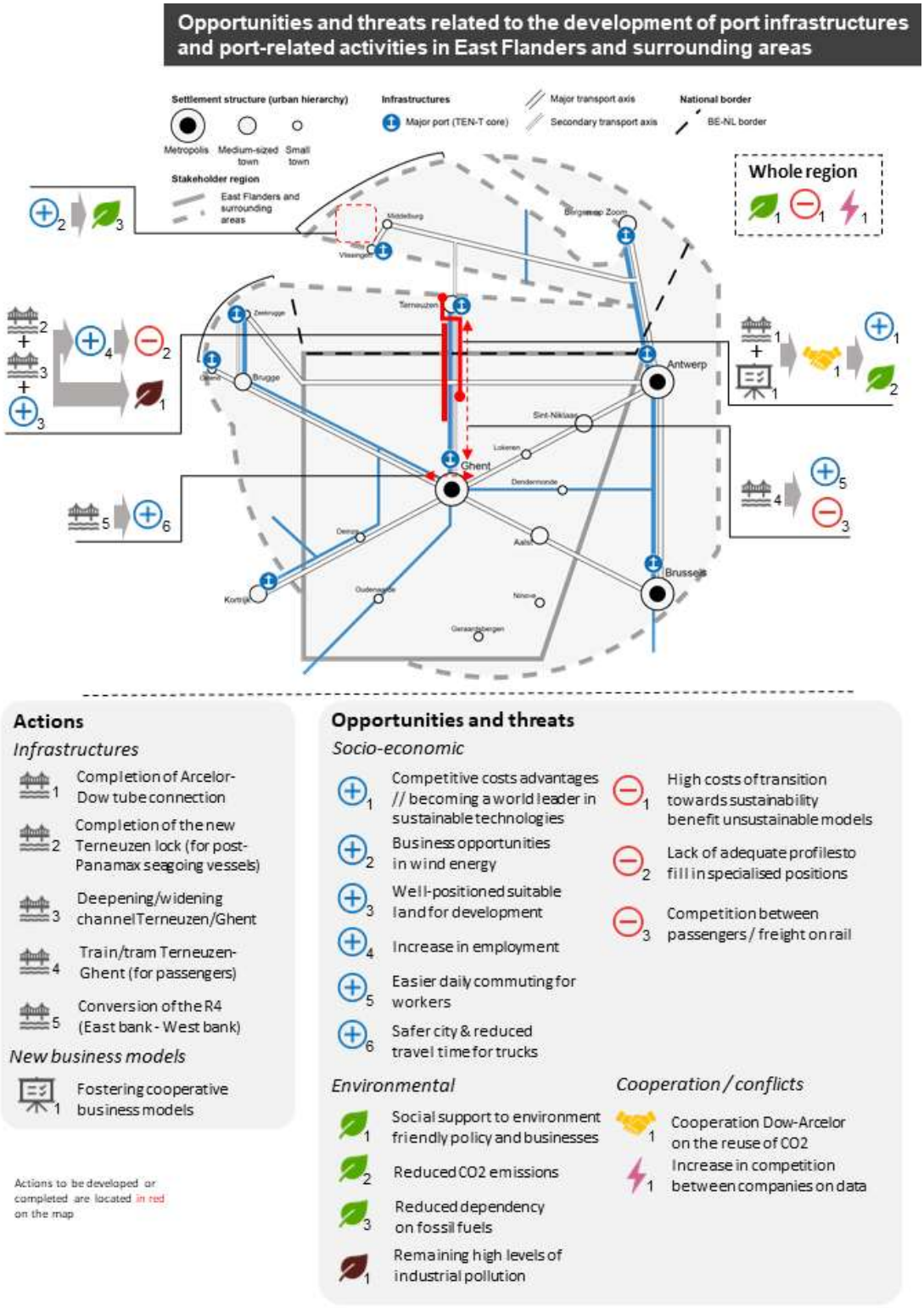
Looking at environmental threats and opportunities, reduced CO_2 emissions as well as a reduced dependency on fossil fuels are major opportunities. In addition, policies and businesses that enhance sustainability will be able to count on social support and in that sense provide a license to operate. A potential threat regarding the environment for the region is that attracting more companies to the region might result in more pollution.

Finally, when looking into potential cooperation and conflicts, the construction of a tube between the two largest port operators is expected to improve the intensity of cooperation. An important potential conflict refers to stronger competition about data. This is an important aspect as the exchange of data will be important for any future development in the port region.

Zooming in on Vlissingen, the recent construction of one of the largest wind farms in the Netherlands creates many new jobs in the area, not only in the construction of wind turbines but also for their maintenance. Furthermore, the wind farm will contribute to reducing the dependency on fossil fuels.

The widening and deepening of the channel between Ghent and Terneuzen as well as the completion of the new Terneuzen sea lock will offer new opportunities for companies and improve their accessibility. This in turn offers the opportunity for more jobs if skilled workers can be found in the local working force.

A current challenge is the rail connection between Ghent in Belgium and Terneuzen in the Netherlands. Improving this cross-border connection would result in easier daily commuting for workers, but also form a threat in the sense that it could result in increased competition between passengers and freight on rail.



Map 5–3 Opportunities and threats related to the development of port infrastructures and port-related activities in East Flanders and surrounding areas

Based on the opportunities and threats for future port development, a series of overarching recommendations can be derived which can be structured along the following two main fields of action (Figure 5–4).

1) Stimulate the use of data in transport in smart and innovative ways

A first access points for future action refers to a common port community system (PCS). Such a system allows clients and terminals to share data along the transport chain. This regards both container transport, roll-on/roll-off transport and break bulk. Depending on the type of freight, cooperation partners are the ports of Amsterdam, Rotterdam, Zeebrugge and Antwerp. Starting points could be a shared system for all Flemish ports or the integration with existing systems such as NxtPort in Antwerp or RX/Seaport in Zeebrugge. Experience from previous systems (e.g. cargo community system (CCS)) shows that in order to make such initiatives a success, it is paramount to also develop a shared vision and clearly commit to using the system.

The second access point refers to the question of leadership of the development process of a joint PCS. Port authorities are well placed to initiate and lead such an approach. Digitalisation processes enable port authorities to play a strong role as interfaces and facilitators along the transport chain. As a first step, it is important to identify and map the different needs of all port operators and logistics companies.

An important issue in the development process of a PCS is the question of data ownership. Hence, a clear strategy is needed to involve all companies interested in a joint PCS. It is important to avoid that one partner collects all data and claims data ownership at a later stage. For this purpose, it can make sense to involve an external, at least semi-public institution that is in charge of data ownership. As the provinces and municipalities are at least indirectly involved in the process as main shareholders of the port authority, they could conjointly establish such an institution. On European scale, the European Commission could also be involved to aim for an integrated European system in the long term.

Providing, collecting, processing and using new data sources requires new skills and might offer new positions. It is hence important to provide qualified labour force that meets these requirements. Partnerships between the ports and the universities (including applied sciences) can contribute to offering training programmes and attracting skilled young talents.

2) Stimulate the climate and energy transition

In the field of energy transition, pipeline infrastructures are an important element of multimodality. Underground pipelines can make a contribution to the reduction of CO_2 emissions. In the context of the North Sea Port, the cross-border dimension is of particular relevance. The first main step in this regard is the establishment of a consortium of relevant Dutch and Flemish businesses, network operators, governments and port authorities.

Rail-road connectivity is another important corner stone of multimodality that also contributes to more sustainable port operations. The North Sea Port is part of three Rail Freight Corridors,

namely North Sea / Baltic, Rhine-Alpine and North Sea / Mediterranean. To further improve hinterland connectivity, the port should also seek links with other Rail Freight Corridors, e.g. Atlantic so to improve connectivity towards France and Spain.

Enormous research and innovation efforts are necessary to succeed in the climate and energy transition of the economy in general, and port-related activities in particular. A cluster that brings together both the port community and the scientific community around the port could contribute to in-depth collaboration. Relevant players are Arcelor Mittal or Volvo. Medium-size players such as the shipping operator DFDS should also be taken on board, not to forget the multitude of small companies. None of them has the necessary resources on its own. Supported by the port authority, however, they have the critical mass necessary to tackle future challenges around climate and energy transition.

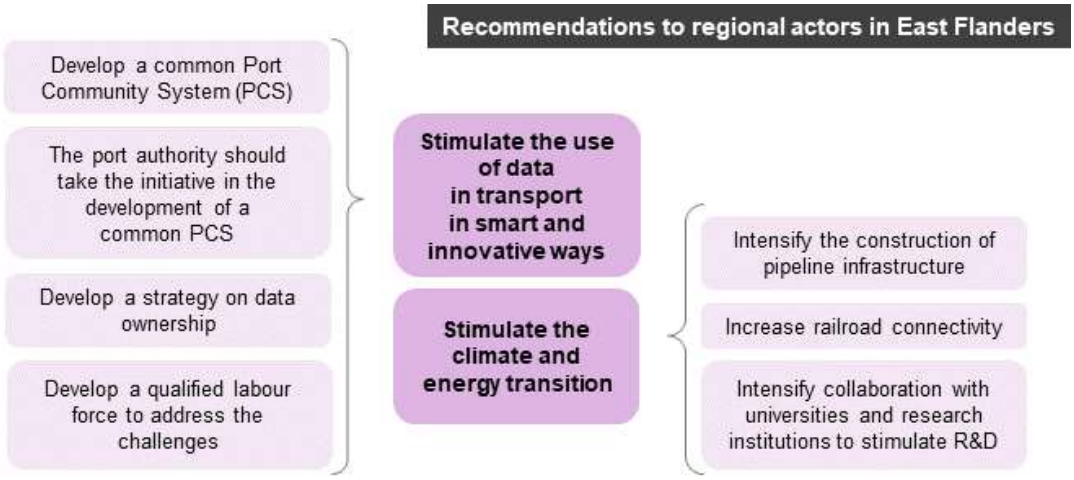


Figure 5–4 Recommendations to regional actors in East Flanders

6 The urban-maritime region in Malta

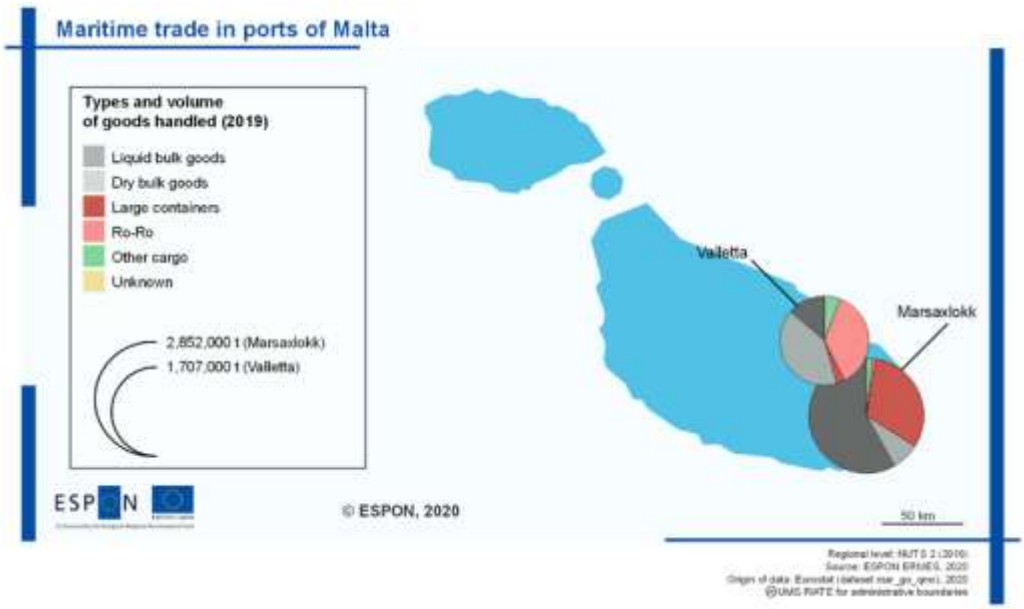
To provide a comprehensive overview, the following starts with a description of the current situation in the urban-maritime region of Malta, followed by an outlook into relevant trends, opportunities and threats relevant for future development and recommendations.

6.1 Present situation

For island states like Malta, ports are crucial infrastructures that play an important role for overall connectivity and ensuring the provision with all types of goods. This aspect covers both connectivity between Maltese inhabited islands, namely Malta, Gozo and Comino, and connections between Malta and the European mainland or other islands.

In 2018, the Maltese ports of Marsaxlokk and Valletta handled about 4.6 million tonnes of freight imported locally, of which about 2.2 million tonnes were containerised cargo (loaded and discharged). Each port has a distinct profile. Marsaxlokk handled 2.9 million tonnes of imported cargo in 2018 with a focus on liquid bulk goods (58 %) and container transport (31 %). For Valletta Port, dry bulk goods (41 %) and roll-on/roll-off transport (37 %) are the most important types of imported cargo. However, liquid bulk goods also play a role (14 %) (Map 6–1).

Further to this, the main maritime activity in terms of containerised cargo handled centers around Marsaxlokk Freeport Terminals. In 2018, containerised transhipment cargo handled at the freeport amounted to 12.7 million tonnes loaded and, respectively, 14.1 million tonnes discharged.

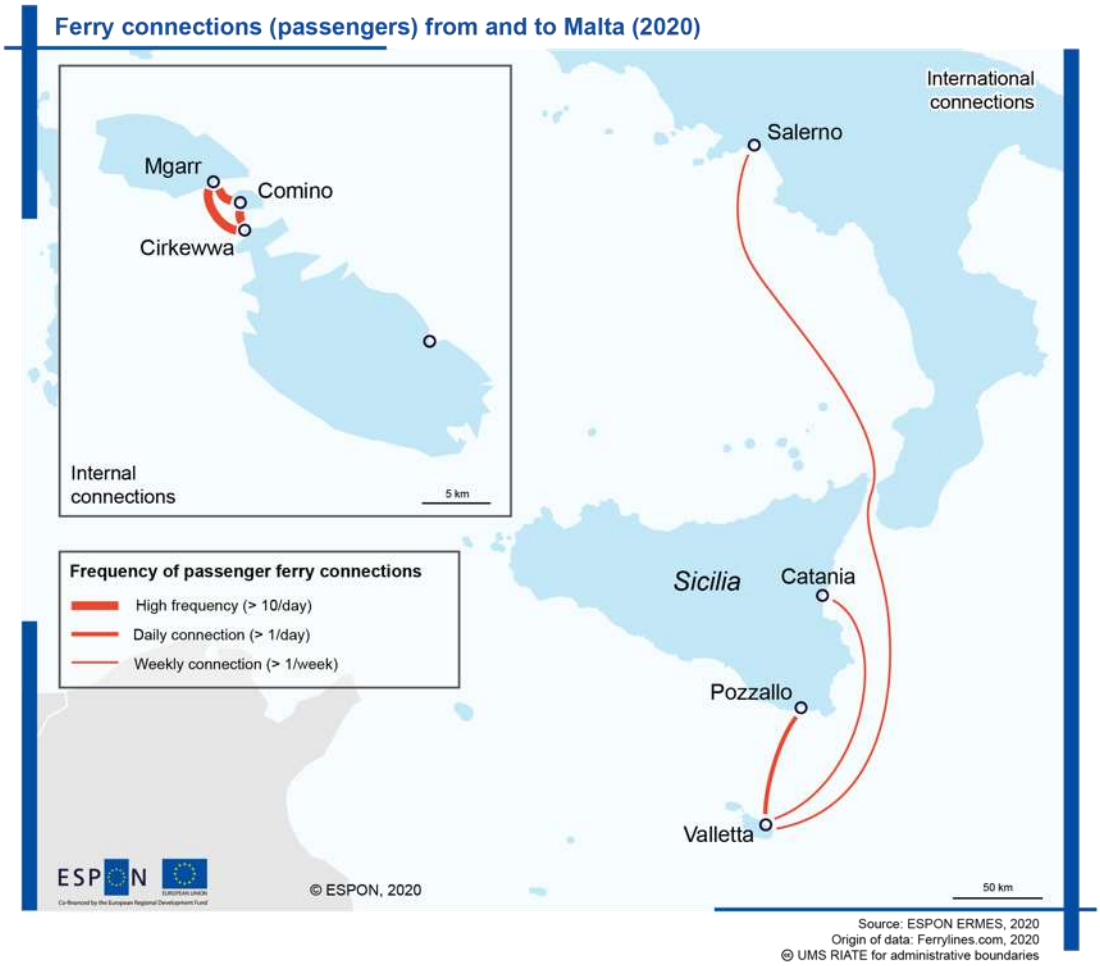


Map 6–1 Maritime trade in ports of Malta (2019)

Passenger ferries offer important connections for Malta. This concerns both connections between the three inhabited Maltese islands of Malta, Gozo and Comino as well as cross-border connections between Malta and Italy (Map 6–2).

Ferry lines that connect the three inhabited islands of Malta, Gozo and Comino are operated frequently. More than ten times per day, ferries carry passengers between the ports of Cirkewwa on Malta and Mgarr on Gozo. From both ports, the smallest island of Comino (since mid-December 2020, 2 inhabitants) can also be reached.

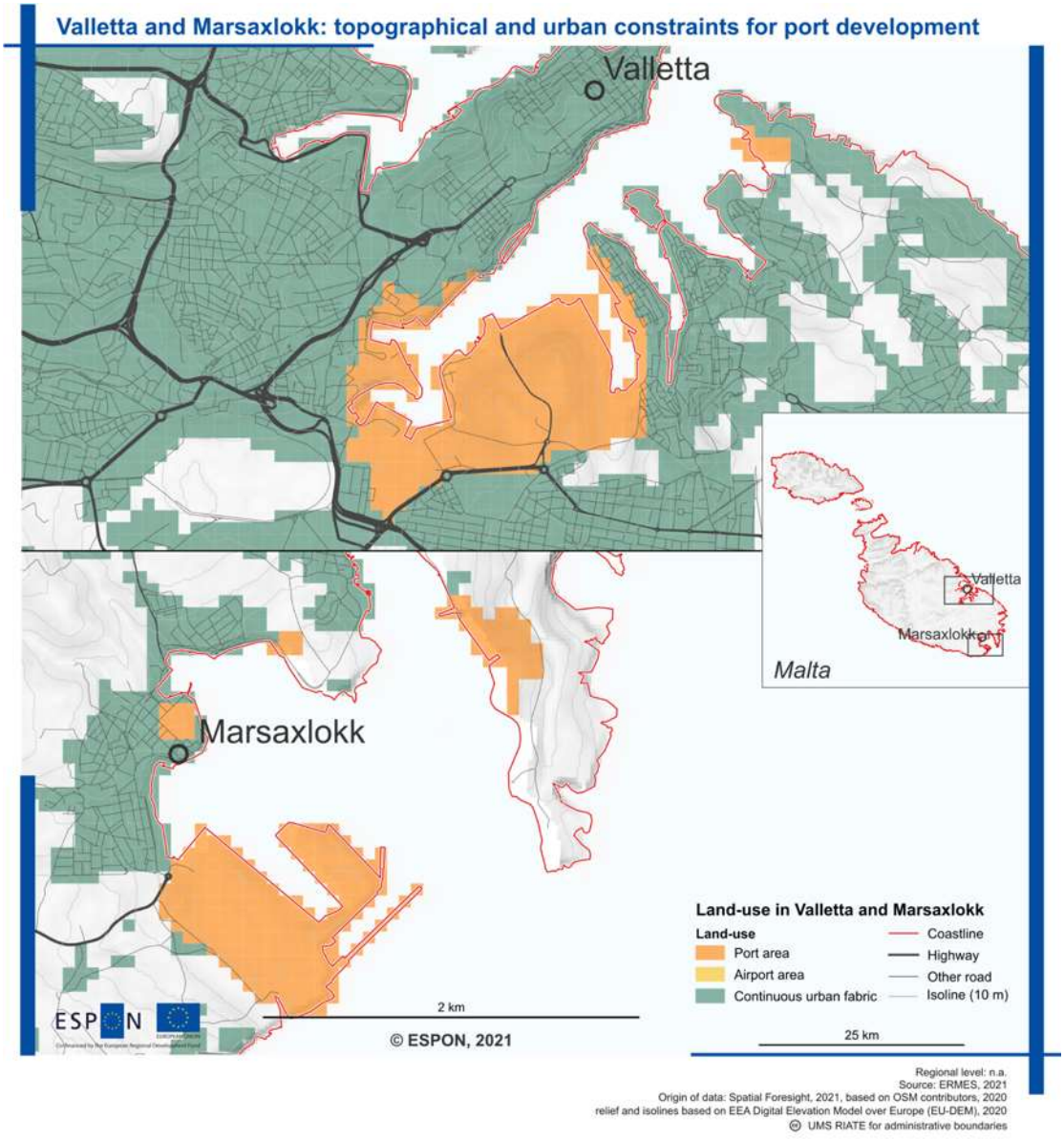
All international ferry connections are operated from the Maltese capital of Valletta. They connect the island with Sicilian island ports in Pozzallo and Catania and the Italian mainland port Salerno. Most frequent connections exist between Valletta and Pozzallo in southern Sicily. More than one ferry per day is operated for this connection.



Map 6–2 Ferry connections (passengers) from and to Malta (2020)

As Malta is a densely populated island, the urban fabric is a strong constraint for future port development. This holds especially true for the port of Valletta which is embedded in a dense network of residential neighbourhoods, business areas and the old town as an important heritage site. This leaves limited room for future expansions. In contrast to Valletta, the port areas in Marsaxlokk are located not only inside but also outside of the main settlement area, especially south of the main urban area around the freeport and on the western side of the bay area, around Delimara (Map 6–3). However, different types of land use imply a high level of diverging interests. This may lead to conflicts about the right priorities and optimal land use.

Additional constraints result from the insular character due to rather low accessibility to European markets as well as high dependency on external transport linkages by air and sea. Gozo is particularly affected by this. As the smaller island of an island state, it suffers from 'double insularity'. From a political perspective, Malta benefits from its autonomy. It can formulate and implement tailor-made policies addressing the specific needs of an island state.

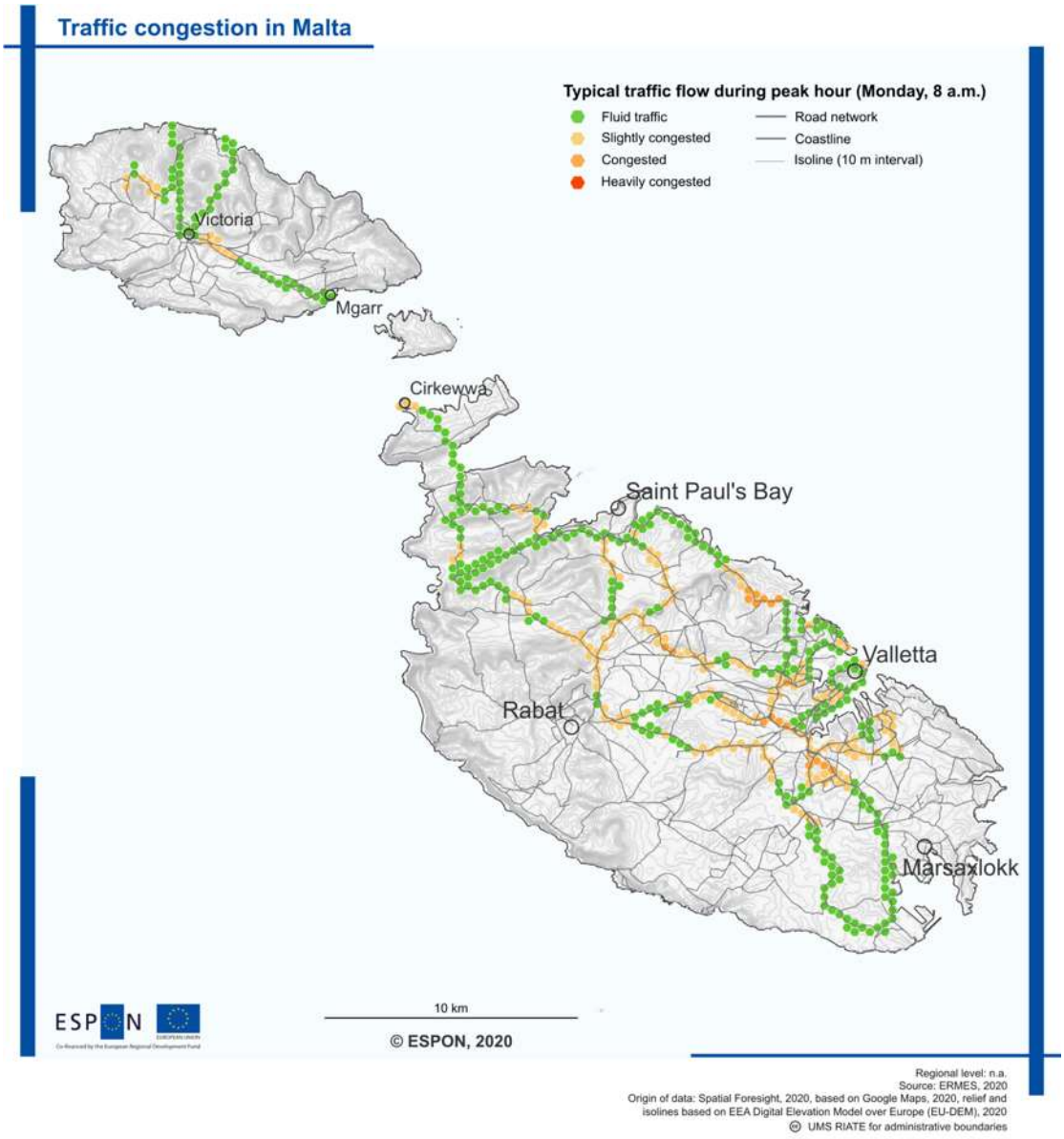


Map 6–3 Valletta and Marsaxlokk: topographical and urban constraints for port development

Malta internal traffic is highly dependent on personal vehicles. The country has one the highest number of cars per inhabitants in Europe. Commuting between main city centres and suburbs is hampered by the high level of congestion which has direct consequences on port activities. Congestion may delay the delivery of goods from and to the ports and is a limiting factor for the development and the sustainability of cruise tourism on the island.

At the highest peak hour during the week (Monday, 8:00, according to Google Maps), most congested points are located between Valletta and other locations of key importance: (1) on motorway 1 to Saint-Paul's Bay; (2) next to the interchange between motorway 1 and 7 in Tar-Rabbat; and (3) on the secondary road towards Marsaxlokk (in Ħal Tarxien).

The embeddedness of Valletta port activities in the city makes it a functional challenge for port operations. For the port of Marsaxlokk, lower congestion and accessibility to nearby logistic centres offer significant competitive advantages for international freight transit.



Map 6–4 Traffic congestion in Malta

Figure 6–1 Political-administrative context for Maltese ports

The political-administrative context provides the overall framework in which all port development activities are embedded. It consists of different levels, from local to national level. The institutional embeddedness for the Maltese ports is rather simple. Each port is part of the respective municipality, which are under the jurisdiction of the Republic of Malta (Figure 6–1). The main distinct element is the specific geography of two islands, Malta and Gozo. The national transport authority of Malta is the main regulatory body overlooking maritime activities in internal Maltese waters. Both ports are run by private businesses. In Valletta, the Valletta Gateway Terminals Limited (VGT) is a joint venture between the Maltese Tumas Group and Portek Group from Singapore. VGT received a 30-years concession for the main port terminals in Valletta from Transport Malta in 2006. The cruise port is operated by Valletta Cruise Port plc which is owned by five private shareholders. The freeport of Marsaxlokk has been run as a private business since 2004. The four shareholders of the freeport are the container terminal operator Terminal Link, Yildrim Group from Turkey, the global shipping line CMA CGM and the Chinese terminal operator China Merchants Port Holdings Company Limited.

Within this overall and rather simple institutional context, a variety of different players can be identified that work on the development around the ports and undertake clustering efforts in the urban-maritime region. A distinction of players can be made based on two key features. First, a focus on public or private interests and the ownership structure and, second, the thematic focus and sector orientation (i.e. port operations and development, spatial planning and land use, business development and industries, research). The national Ministry for Transport,

Infrastructure and Capital Projects is the main actor with a strong focus on public interests (

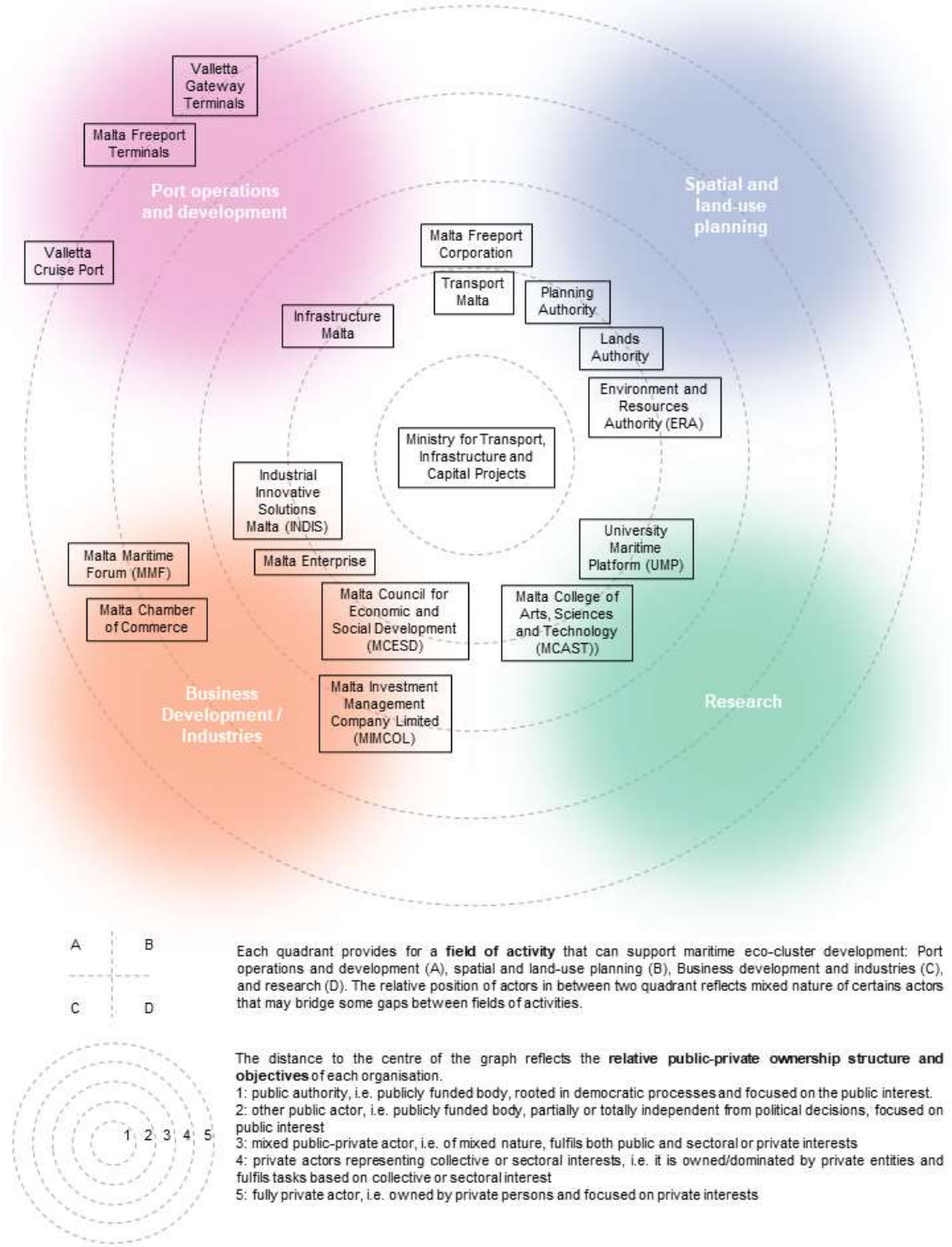


Figure 6–2).

In the fields of research and spatial planning / land-use, mainly public bodies can be identified as relevant players, all of which have a strong focus on public interest. Among these are a university, a college and various authorities. In contrast, the fields of business, industries and port operations show a higher diversity and a mix of public and private players. Among players active in these fields are, inter alia, the terminal and port operators as well as the chamber of

commerce but also single enterprises. This diversity and complexity of actors implies, inter alia, diverging interests that need to be coordinated from an overarching perspective.

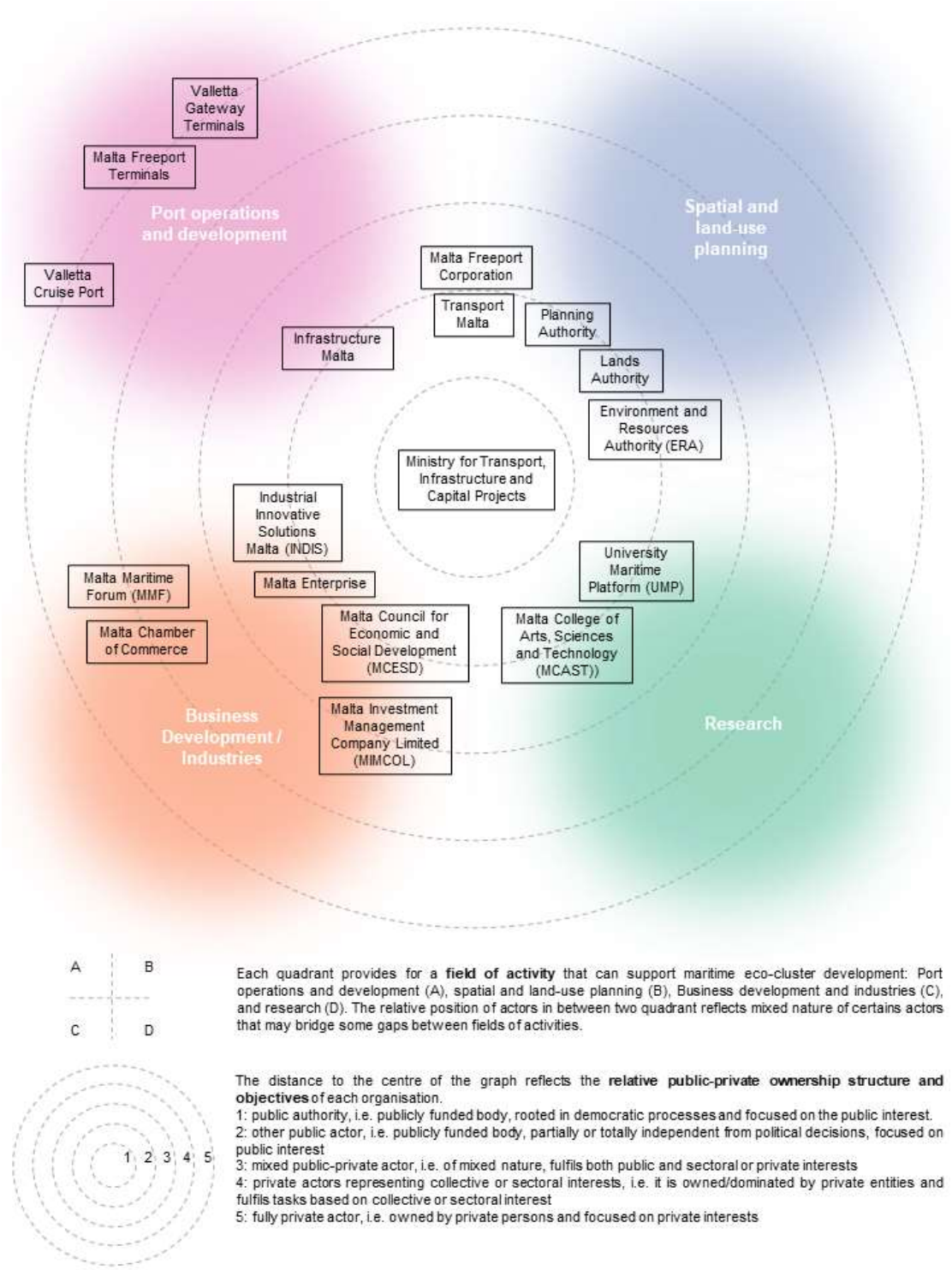


Figure 6–2 Overview of actors relevant for port development in the ports of Malta

6.2 Future perspectives

National transport plans for Malta like the national transport strategy 2050 and the master plan 2025 define overarching visions and strategic objectives for transport development in Malta. Against this background, the trends of 'optimisation of port operations' and 'enhancement of sustainability' are of major importance (fully shaded – in red and in green). In addition, the trend of 'port regionalisation and multimodality' is another important trend for future port development, although to a lesser extent than the other two trends (partially shaded – in yellow) (Figure 6–3).

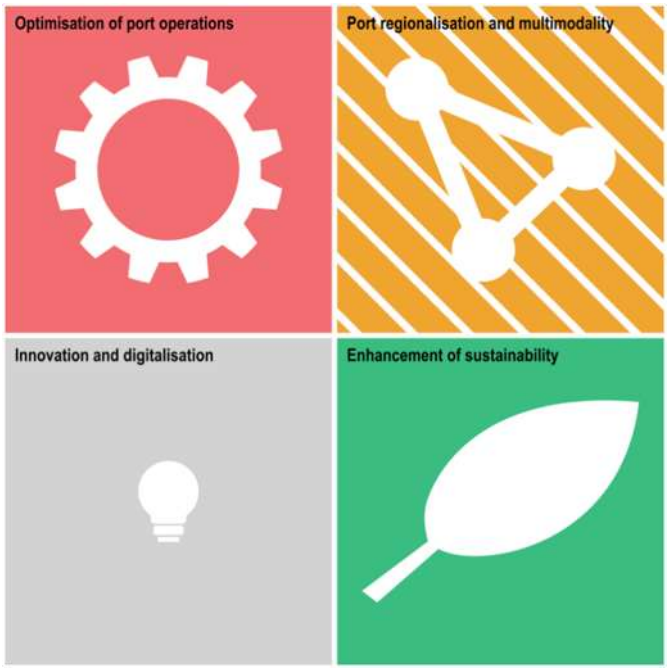


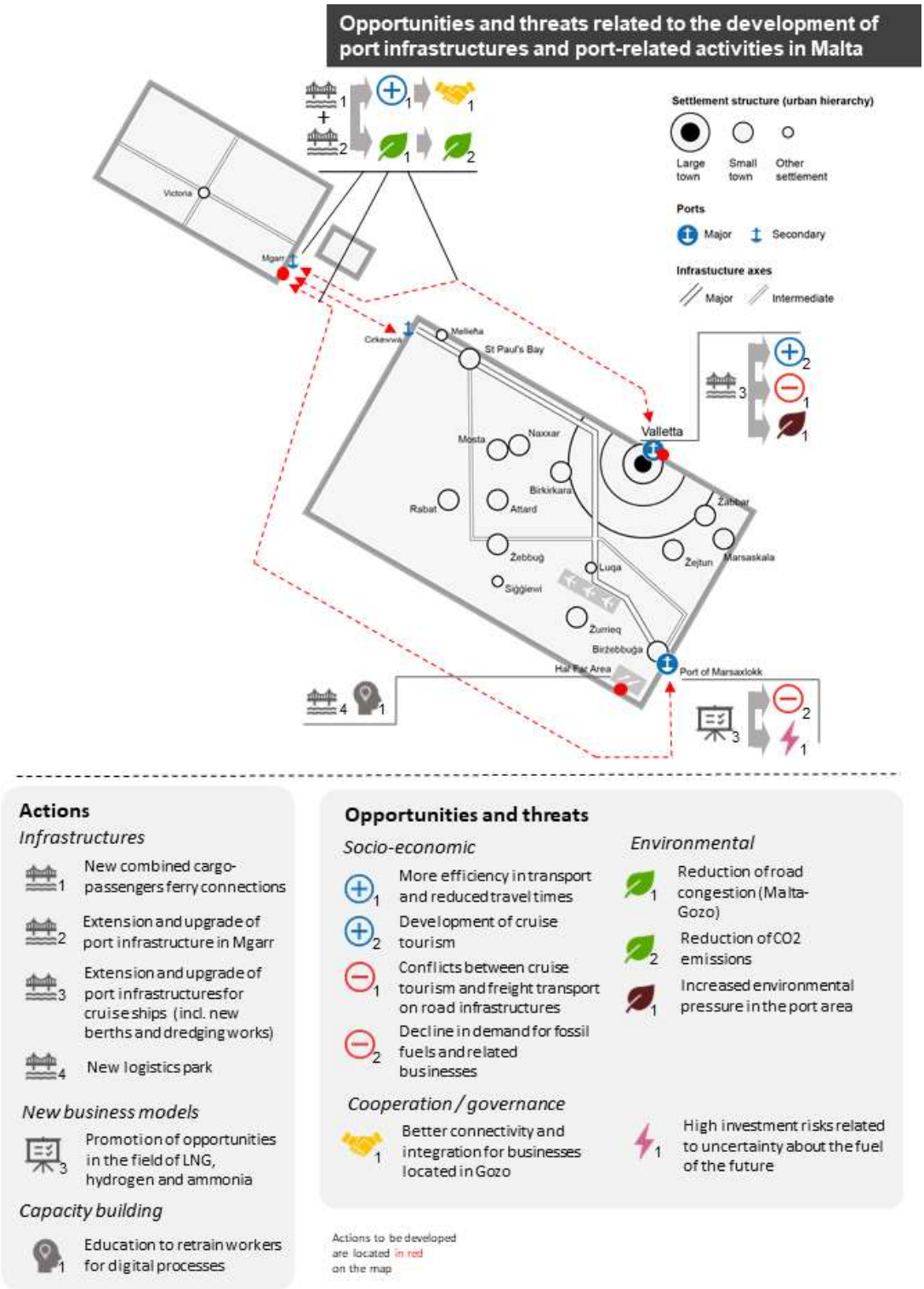
Figure 6–3 Importance of different trends for Malta

With regard to the trend of 'optimisation of port operations' the focus is on better automation. In this context, the Maltese strategy 2020 for research and innovation is a key policy document. It aims at shaping a knowledge-based economy and society. Related activities are no end in themselves but a means to address development challenges and increase economic competitiveness.

In the field of 'enhancement of sustainability', the national policy for alternative fuels infrastructure for transport defines the framework for achieving important objectives, e.g. the reduction of combustion engines in the vehicle fleet. Other activities aim at increasing the use of liquified natural gas (LNG) and the potential of shore-side supply of electricity for berthed vessels in Maltese harbours.

Another important trend refers to 'port regionalisation and multimodality'. Port development in Valletta and Marsaxlokk faces different constraints. Road congestion is a key challenge for the effective and seamless functioning of port activities. Hence, multimodal and decentralised approaches in organising port-related activities are important for the future of the Maltese ports. This topic also includes inter-island connectivity between Malta and Gozo, coordination between Valletta, Marsaxlokk and Mgarr as well as multimodal hinterland connections. Due to land scarcity environmental impacts, land consumption and pollution also need to be taken into consideration. The Local Grand Harbour Plan (2002) emphasises the importance of considering such diverging needs for the urban-maritime region – for example, economic prosperity, social revitalisation, regeneration of the port and conservation of green areas.

Besides overarching trends that are relevant for future development perspectives of the urban-maritime region, various ongoing and planned port-related activities imply a range of opportunities and challenges for the urban-maritime region in Malta (



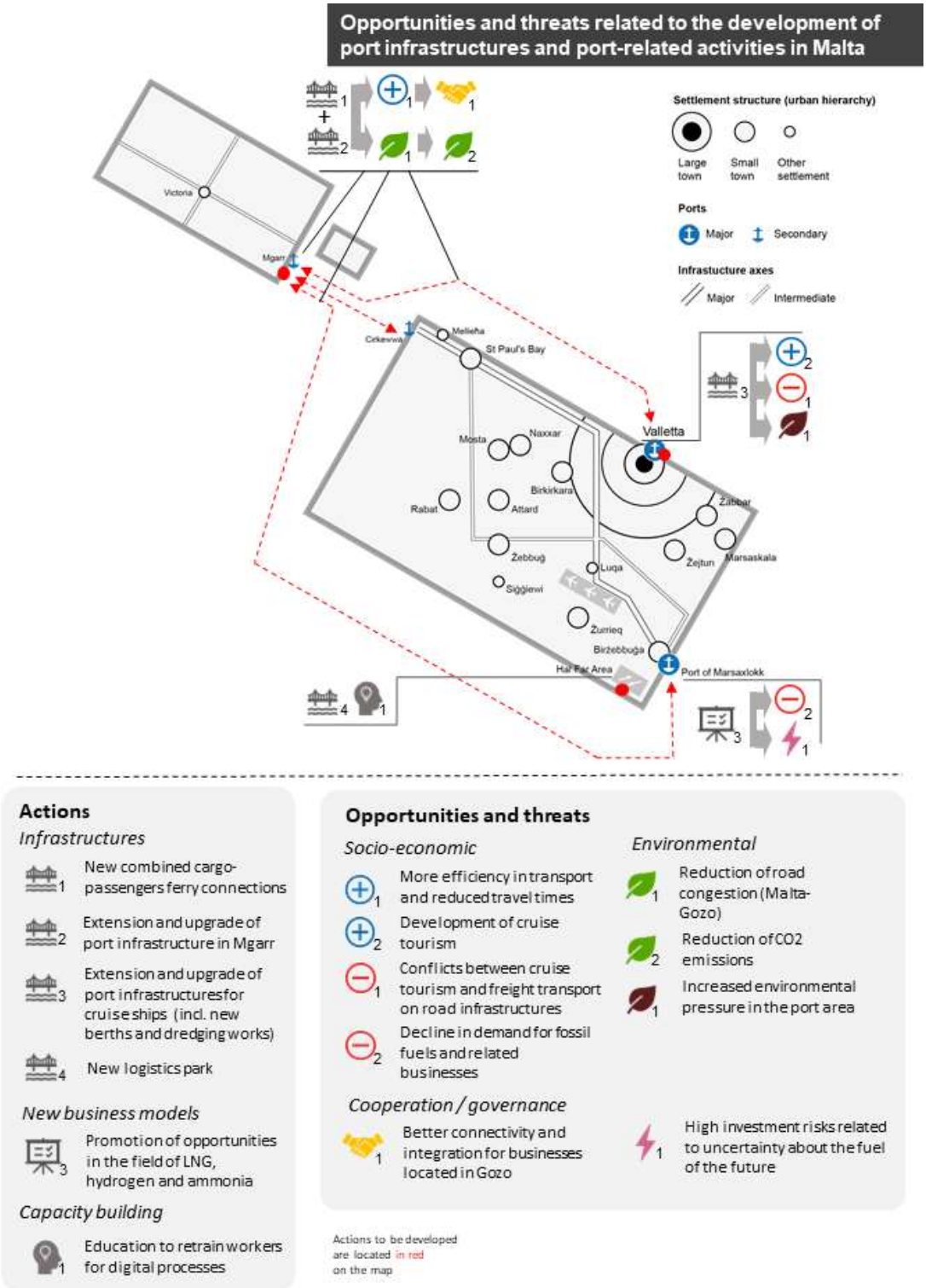
Map 6–5).

Better ferry connections, including combined passenger and cargo ferry lines, between the two islands and measures to extend and upgrade the port infrastructure in Mgarr (Gozo) would be first starting points to improve inter-island connectivity between Malta and Gozo. This would

contribute to smoother and more seamless transport connections which can be translated into higher efficiency and shorter travel times both in freight transport and passenger traffic. If connections between Malta and Mgarr are taken into consideration, this would also imply less road traffic congestion (with the consequent lower CO_2 emissions). A reduction of road congestion would also benefit commuters and reduce their losses of travelling times. Overall, especially businesses located on Gozo Island could benefit from better integration of the two Island transport systems and higher inter-island connectivity.

Looking particularly to main opportunities and threats related to the development of port infrastructures at the port of Valletta, the development of port infrastructures for cruise ships could entail an important bottleneck. Extending and upgrading the existing infrastructures would help further developing the existing cruise tourism sector but might also increase over-tourism and imply additional conflicts between tourism-related transport and other types of transport (i.e. freight transport). In addition, one needs to take into consideration that the environmental pressure in the port area could further increase, leading to an increase in noise and air pollution, especially as the port of Valletta is embedded in a densely populated urban area of significant historical importance.

Looking into the opportunities and future development perspectives for the port of Marsaxlokk, two infrastructure preconditions were highlighted. The need to develop a new logistics park (near the existing Hal Far Area) to be coupled with the creation of certain training facilities where the maritime labour force could upgrade their skills especially with regard to enhancing their knowledge around digitalisation issues. The port is also envisioning infrastructure opportunities with regard to the promotion of liquefied natural gas (LNG), hydrogen and ammonia as potential new sources of maritime fuels. However, if the usage of such innovative energy sources does increase, it would not only imply opportunities for future development of the area, but would also entail risks for existing businesses processing fossil fuels which are yet an important business component at the port of Marsaxlokk. These businesses would have to adapt and reconvert to these new energy sources. However, given the high level of uncertainty that still exists around how these innovative energy sources would be developed, the port and its businesses would also need to take into consideration the high investment risks that reconverting to these energy sources could entail and decide when to enter in concrete implementation activities.



Map 6–5 Opportunities and threats related to the development of port infrastructures and port-related activities in Malta

Based on the opportunities and threats for future port development, a series of overarching recommendations can be derived which can be structured along the following two main fields of action (

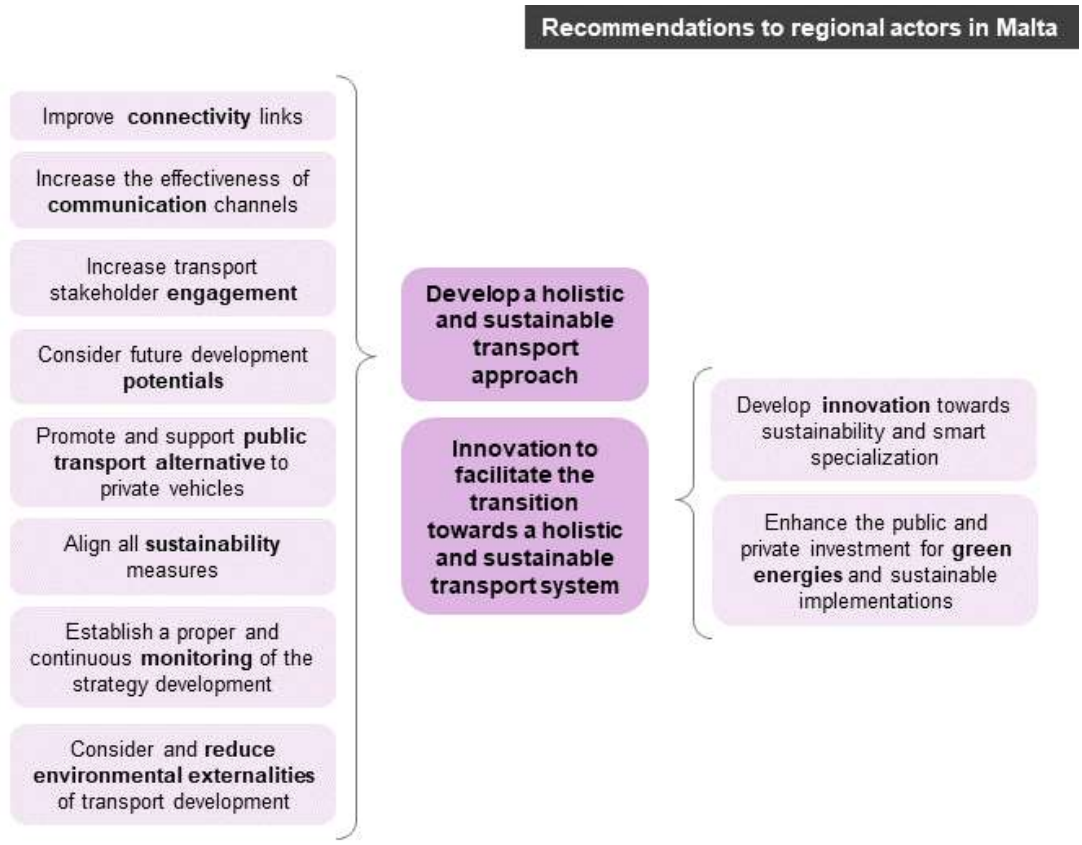


Figure 6–4):

1) Develop a holistic and sustainable transport approach

A first starting point for a more holistic approach in transport planning would be to improve connectivity between Malta and Gozo so to allow for better development perspectives for sustainable transportation modes in Gozo.

Another important element towards a more holistic approach lies in higher effectiveness of communication channels, especially between the three main ministries responsible for various aspects of sustainable transport (i.e. the ministry for transport, infrastructure and capital projects; the ministry for energy, enterprise and sustainable development; the ministry for the environment, climate change and planning) and all actors working in transportation and logistics in Malta.

A third element concerns wider stakeholder engagement as an important precondition for developing a clear vision and setting up a robust strategy to achieve the vision. Effective engagement contributes to translating stakeholder needs into strategic goals. Participation should be as wide as possible, which would call for new models of knowledge production in order to be able to develop holistic solutions, to consider the variety of perspectives, and to support a more deliberative approach. The creation of an all-inclusive Maltese forum could help achieving this recommendation.

A fourth element refers to land-use management and related development potential. Those areas that show a high potential need to be well accessible by public transport. To ensure effective land-use, it is important to consider land-use and transport development from an integrated perspective. Considering the needs of the port – both the grand harbour and the freeport – are essential to allow for proper sustainable urban-port development. This includes the accessibility and future growth perspective of port areas, relevant business areas, the airport and aviation-related businesses.

With a stronger focus on sustainability, public transport needs to be promoted as an effective alternative to private vehicles, especially with regard to the last mile and reaching final destinations. This change would require a mix of push and pull measures, e.g. restricting the use of private vehicles, promoting mixed use developments, designing a transport plan based on a sound analysis of the mobility patterns and promoting the need to change mobility behaviour. Overall, public transport must become an attractive alternative. It must be accessible and socially inclusive. Transport connections both within and between towns need to be improved through more frequent connections.

Many measures to increase sustainability in transportation are already in place. However, they lack alignment. Many activities are implemented in isolation. A structured roadmap following a clear and ambitious vision would help in this regard. Available funding opportunities, for example in the context of EU programmes such as Connecting Europe Facility or the new Recovery and Resilience Facility need to be scanned so to ensure stable financing and actual implementation of the measures described in the roadmap. This is especially relevant for smaller companies and local institutions who do not have the necessary resources and do not know the entire field. Here, the government should provide support for application procedures and implementation of EU-funded activities.

Another important aspect refers to a proper and continuous monitoring of the strategy development and implementation. A monitoring system is needed to assess the progress during the implementation stage and see whether the agreed tasks have already been fulfilled and what can be done in case of delays. This is important to eventually implement the strategy and achieve the objectives in due time.

A last element for more holistic and sustainable transportation is to better address the environmental externalities from transportation. Adopting environmental measures to avoid pollution, reducing congestion, reducing traffic impact, ensuring accessibility and supporting the creation of quality environments within the urban area and prime tourism sites is essential so to preserve the attractiveness of the region. At the same time, supporting the integrated regeneration of degraded areas through infrastructural improvements and the introduction of environmentally friendly initiatives is also important.

2) Innovation to facilitate the transition towards a holistic and sustainable transport system

Innovation is an important precondition and should be further promoted so to achieve the strategic goals in an efficient and effective manner. Maltese actors can drive innovation towards sustainability through their efforts. Due to scale limitations, they should, however, not re-invent the wheel but rather focus on and benefit from technology transfer. Consideration should be given to good practices and technologies which can be applied to address local needs.

Last but not least, more public and private investments are needed to promote the use of green energy and the implementation of various measures aiming for sustainability in the transport sector. First of all, there needs to be a shared understanding on which investments are needed and which should be prioritised. The transition towards sustainable infrastructures requires enormous financial resources, but will eventually benefit both businesses and citizens, inter alia, through new job opportunities and better quality of life. Incentives provided at national level are needed to stimulate and support relevant business initiatives in their ambition and activities to minimise their carbon footprint.

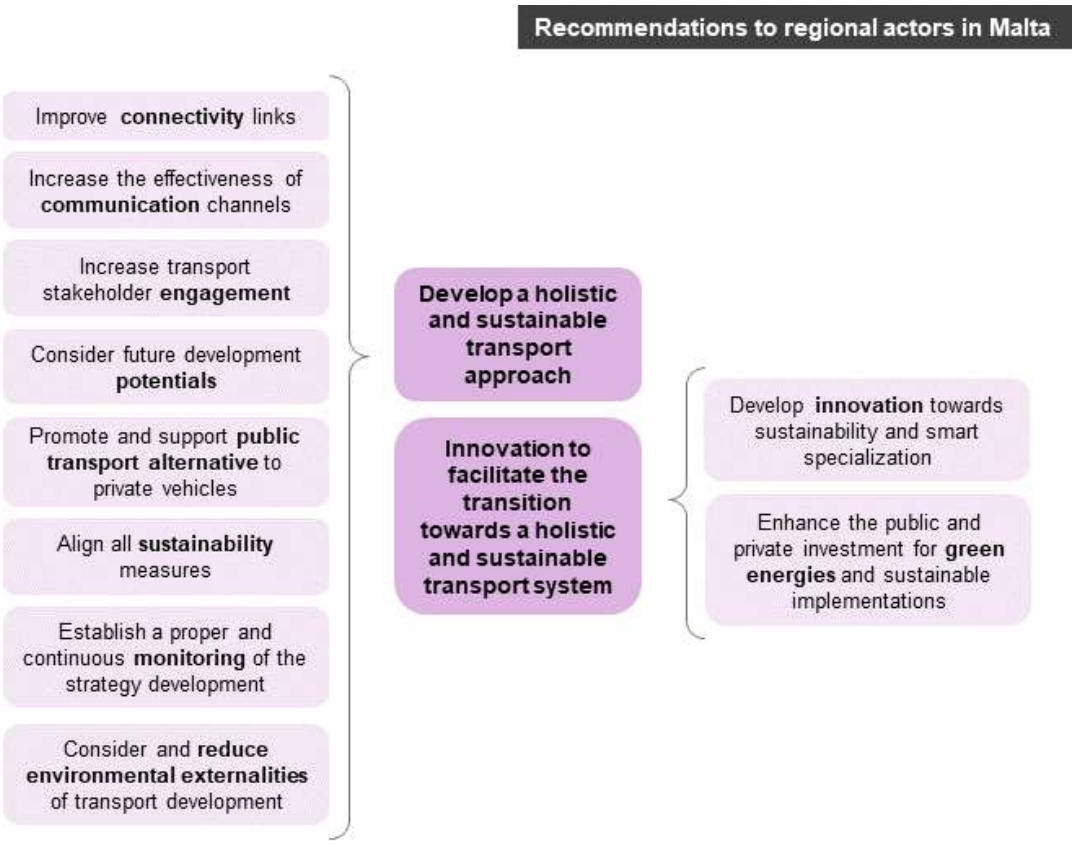


Figure 6–4 Recommendations to regional actors in Malta

7 Future perspectives for integrated development in urban-maritime regions in Europe

The promotion of integrated development is a challenge all urban-maritime regions across Europe are facing. New technologies emerge, digitalisation processes are in full swing, carbon neutrality and more sustainable transport modes become ever more important, new players enter the game and land is a scarce resource. This offers several opportunities and development perspectives but also entails a variety of challenges that need to be taken into consideration and eventually balanced. To support urban-maritime regions in Europe, a series of recommendations can be derived. They are interrelated and refer to different subsequent steps in a process of policy design and delivery that is relevant for all urban-maritime regions in Europe (Figure 7–1).

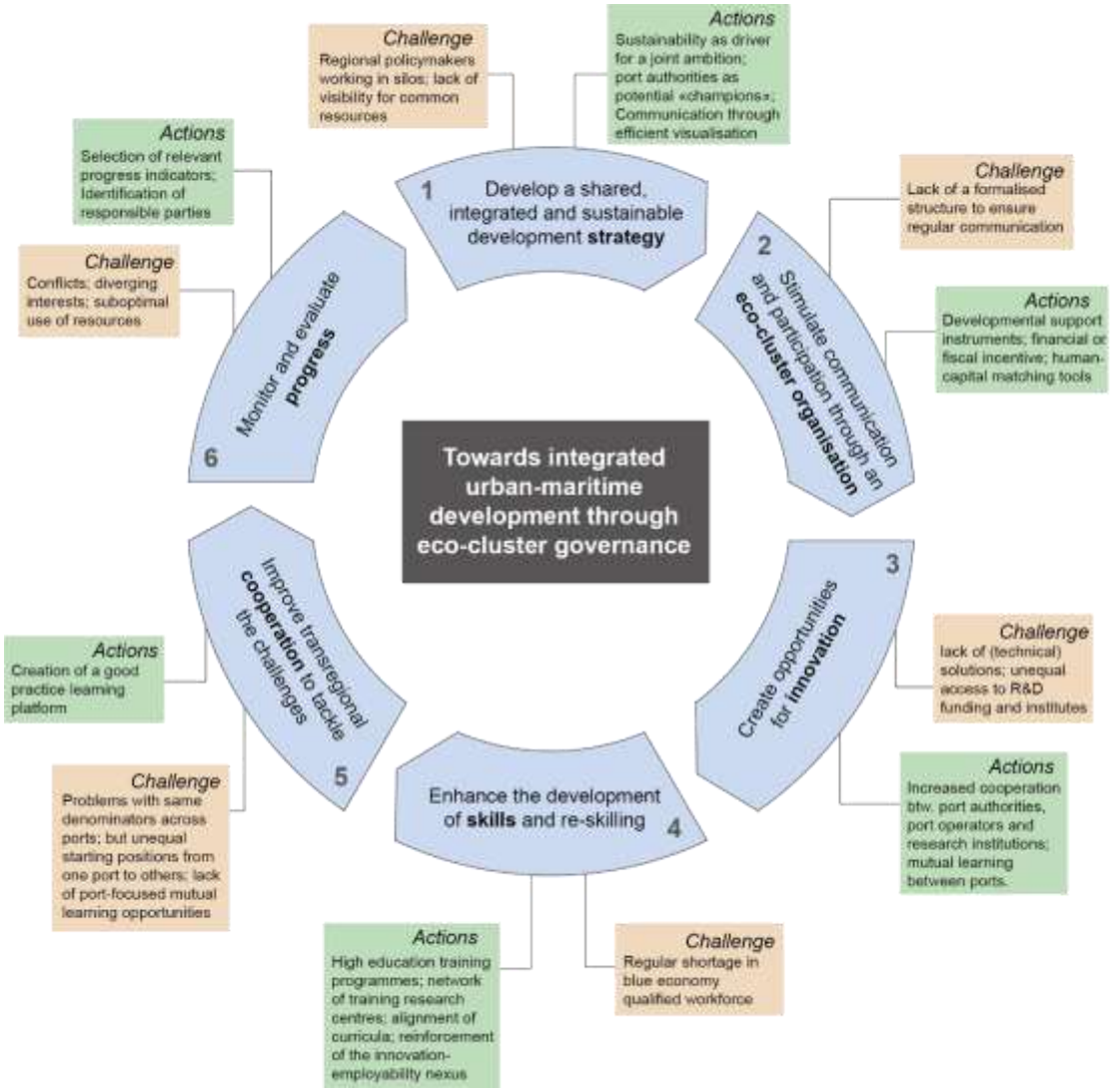


Figure 7–1 Recommendations for integrated development in urban-maritime regions in Europe

1) Develop a shared, integrated and sustainable development strategy

Ports and industries working in the maritime sector have great influence on the socio-economic development in many coastal regions. Nevertheless, policy making in these regions is often restricted to a structure of isolated silos. It does not follow an integrated perspective. Only little attention is given to the port as starting point for regional development. To unleash the full socio-economic potential of the port and the wider maritime sector, all relevant stakeholders (from public authorities and academia to private businesses and infrastructure operators) need to be brought together so to conjointly develop and commit to an integrated strategy. As a compass, such a strategy can provide direction for further implementation activities.

Most important topics for such a strategy are sustainability, digitalisation and hinterland connectivity. A shared understanding of long-term challenges and related objectives can contribute to aligning available resources with a clear focus and to the benefit of the entire region. Clear and strong leadership is another key component. One stakeholder needs to be willing to invest time and resources in coordinating all activities, communicating with all players and integrating across diverging and sometimes opposing perspectives. Port authorities are well positioned to be this 'champion'.

2) Stimulate communication and participation through eco-cluster organisation

Clear communication is paramount for effective and efficient strategy development and implementation. Often, however, no formal structure exists through which actors can communicate, cooperate and coordinate their activities. This makes it difficult to develop and implement a joint strategy. This challenge can be tackled through an eco-cluster organisation. Such an organisation can bring together port authorities, public authorities and relevant government actors, the private sector and businesses, academia and universities and facilitate the implementation process. It can also contribute to capacity building and knowledge sharing.

For an eco-cluster organisation to be successful, it is important that its benefits become visible, are made explicit and are clearly communicated to the different stakeholder groups. The eco-cluster organisation can provide support in various fields and through different activities such as financial incentives, information about funding instruments, internal events to bring actors together that face similar problems and public events that allow enterprises from the maritime sector to present themselves and inform the wider public and local labour force about the port, its activities, available job opportunities and related requirements.

3) Create opportunities for innovation

Innovation plays an important role in determining the cluster development potential of urban-maritime regions. Investments in innovation are an important precondition for increasing competitiveness and encouraging sustainability efforts. Relevant fields are, inter alia, digitalisation, greener fuels, data management and smart transport. However, not all ports have the advantage of close proximity to universities and research institutions. Large port operators often have the capacities and resources to invest in innovation, research and development.

Such investments and activities are often more difficult for smaller port operators. Hence, there is a need for more cooperation between port authorities, port operators and research institutions so to develop and exploit opportunities for innovation. Still, the scope and focus of related activities depend on, and should be adjusted to, the specific local context. One-size-fits-all solutions do not work.

Some starting points might help urban-maritime regions in their efforts. A liaison officer that regularly exchanges with players and enterprises working in the maritime sector as well as the scientific community could be of added value. Smaller operators and urban-maritime regions with little own resources should join forces with other smaller operators and urban-maritime regions who face similar challenges. This can help them in creating the critical mass necessary for meaningful activities. In addition, also cooperation between larger and smaller port authorities and port operators could be a way forward as it allows smaller players to benefit from the capacities and experience of larger ones.

4) Enhance the development of skills and re-skilling

Sustainable maritime transport is an essential source of economic activity. At the same time, the education of new workers and the updating of skills of existing workers is key for shaping future economy possibilities. Yet, many enterprises experience difficulties in finding the right employees. Many of which expect these difficulties to continue in the near future and the skills gap between education offer and labour market to widen. Topics of particular relevance are new technologies, engineering, scientific monitoring, marine environment and adaptation of knowledge in the field of sustainability. New curricula, platforms for knowledge sharing and mutual learning are needed to close the gap.

Specific actions in this regard refer to targeted education and training programmes such as vocational education and training (VET) and higher education centres but also summer schools, research mobility and exchange programmes, professional traineeships, workshops and conferences. Particular emphasis should also be put on how to make best use of new digital technologies for such programmes, e.g. through augmented reality. Networks across different stakeholder groups could be set up to develop and implement such programmes and activities or develop own training courses. Eco-cluster organisations could take over this role and function as intermediary for capacity building. A better integration between education and training programmes and existing policy strategies - for example, smart specialisation strategies, could also contribute to a more focused educational environment.

5) Improve transregional cooperation to tackle the challenges

Many challenges urban-maritime regions are facing, can be traced back to common denominators. However, the starting position of ports and urban-maritime regions differ significantly. In addition, many regions are not involved in platforms that allow them to benefit from good practices and transfer and adjust these practices to the own local context. At the same time, the European Union expects ports and maritime regions to make significant

contributions to the objectives defined for the EU Green Deal.[4] A transregional system of cooperation could support maritime actors to address the aforementioned issues. Sharing experience about common problems would allow for mutual learning and synergies. Maritime regions with less favourable preconditions could benefit from more advanced regions and catch up by adopting solutions developed in other parts of Europe. Altogether, this would strengthen the position of ports and maritime regions with regard to the EU Green Deal and would allow all players to benefit from related EU funding instruments such as the Connecting Europe Facility.

Both ports and cities are involved in European platforms, e.g. ESPO and FEPORT for ports and POLIS and EUROCITIES for cities. Before a new organisation is established, urban-maritime regions should explore with the abovementioned organisations whether specific platform could be set up within one of the organisations. If this is not possible, a new platform could be established. In this case, urban-maritime regions should explore whether the European Commission can provide support for such an initiative as it shows strong linkages with key EU policies such as the Green Deal and TEN-T. To start with, the four regions covered in this atlas should further explore different options.

6) Monitor and evaluate progress

Strategy delivery can be hampered by various factors, inter alia, because of conflicts arising from diverging interests and priorities of different stakeholders, disruptions due to external developments, and changes in local, regional and national priorities. This in turn can have negative impacts on available resources and the level of motivation and commitment. A monitoring plan is necessary to ensure that progress is made within the intended resources and timeline. However, it should also allow for flexibility and adjustments.

At an early stage, it is important to define progress indicators with regard to concrete activities, their output, the effect on the addressees and the impact on wider regional development. A lead stakeholder and a clear timeline are other important features. Transparency, a sound evidence basis and regular inputs from other stakeholders involved in the implementation process or affected by it, can further increase the added value. At the same time, it is important to design a process that does not create unjustified burden and additional costs. Overlap with other obligations regarding data collection should be minimised. A well designed and efficient monitoring framework can enable communication and cooperation between various stakeholders and, thus, contribute to the functioning of the eco-cluster.

[4] COM(2019) 640 final

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