

SUPAIR
SUSTAINABLE PORTS
IN THE ADRIATIC-IONIAN REGION

Transnational strategy for low-carbon transport systems in the Adriatic-Ionian basin

AUTHOR/INSTITUTION: L. Sdoukopoulos, A. Tromaras, M. Boile – CERTH/HIT

WPT2

Last update: 11/05/2020

Work package: T2 – Accruing knowledge and sharing results: capacity building and mutual learning

Deliverable title: T2.4.2 - Transnational strategy for low-carbon transport systems in the Adriatic-Ionian basin

Expected date: Dec-19

Deliverable description: The Transnational strategy for low-carbon transport systems in the Adriatic-Ionian basin accompanies the Memorandum of Understanding (MoU) which has been devised for formally establishing the ‘Network of ADRIION Sustainable and Low-Carbon Ports’. The strategy’s long-term goal is to increase capacity and expertise for efficiently designing and implementing sustainable, low-carbon transport systems’ action plans within port areas.

Partner responsible for the deliverable: CERTH - HIT

Document Author(s): Sdoukopoulos Lefteris, Tromaras Alkiviadis, Boile Maria

Dissemination level: PU - Public

Status: Final

Version: 0.5

Date: 11/05/2020

<i>Version</i>	<i>Date</i>	<i>Author</i>	<i>Organisation</i>	<i>Comment</i>
0.1	01.11.2019	Lefteris Sdoukopoulos, Alkiviadis Tromaras, Maria Boile	CERTH	Initial draft
0.1	20.12.2019	Lefteris Sdoukopoulos, Alkiviadis Tromaras, Maria Boile	CERTH	Processing of comments received from the SUPAIR Mutual Learning Workshop – Final draft
0.2	06.03.2020	Silvia Zampese, Fabio Tomasi	AREA	Review
0.3	03.04.2020	Lefteris Sdoukopoulos	CERTH	Update based on review comments – near final draft
0.4	06.05.2020	Silvia Zampese, Fabio Tomasi	AREA	Review
0.5	11.05.2020	Lefteris Sdoukopoulos		Update based on review comments – final version

The content of this document reflects only the author's view and the Programme Authorities are not liable for any use that can be made of the information in it included

Table of Contents

1. Introduction.....	4
2. Transnational strategy for low-carbon transport systems in the Adriatic – Ionian basin.....	6
2.1 The challenge	6
2.2 Vision, mission and objectives	7
2.3 Guiding principles.....	8
3. Alignment with relevant policy frameworks and regulations	9
3.1 International policies	10
3.2 European policies.....	10
3.3 Regional policies.....	12
3.4 National policies.....	13
4. Strategic initiatives to be exploited	18
5. Recommendations.....	19
References.....	21

Table of Figures

Figure 1 – The steps followed by the ports for developing their low-carbon action plans.....	5
Figure 2 – The intervention areas addressed by the 7 low-carbon action plans of the SUPAIR ports.....	5
Figure 3 – Top 10 environmental priorities of European ports over the last 15 years (ESPO, 2019)	6
Figure 4 – Pillars of guiding principles supporting Network members in the roll out of the Strategy.....	8
Figure 5 – The key elements of the European Green Deal.....	11

1. Introduction

The [Interreg V-B Adriatic-Ionian programme \(ADRION\)](#) is a European transnational programme that invests in regional innovation systems, cultural and natural heritage, environmental resilience, sustainable transport and mobility as well as capacity building. By bringing together 8 Partner States (i.e. Albania, Bosnia and Herzegovina, Croatia, Greece, Italy, Montenegro, Serbia and Slovenia), ADRION aim is to act as a policy driver and governance innovator, fostering European integration among Partner States, benefiting from their rich natural, cultural and human resources, as well as enhancing socio-economic and territorial cohesion in the Adriatic -Ionian region. To this end, the Programme's investments are structured around four key priority axes:

- *Innovative and smart region*: promoting business investments in R&I; developing links and synergies between enterprises, research and development centres and the higher education sector; promoting investments specifically in product and service development, technology transfer, social innovation, eco-innovation and public service applications; demanding stimulation, networking, clusters and open innovation through smart specialisation,
- *Sustainable region*: conserving, protecting, promoting and developing natural and cultural heritage; protecting and restoring biodiversity and soil; promoting ecosystem services (including Natura 2000) and green infrastructure,
- *Connected region*: developing and improving environment-friendly and low-carbon transport systems, including inland waterways and maritime transport, ports, multimodal links and airport infrastructure in order to promote sustainable regional and local mobility,
- *Supporting the governance of the EU Strategy for the Adriatic and Ionian Region (EUSAIR)*: enhancing institutional capacity of public authorities and stakeholders and efficient public administration by developing and coordinating macro-regional and sea-basin strategies.

Addressing the 'Connected region' priority of ADRION and focusing, more specifically, on the role of ports for moving towards more sustainable and low-carbon transport systems in the region, the '[SUPAIR – Sustainable Ports in the Adriatic-Ionian Region](#)' project aimed to (a) enhance the capacity of the 7 port authorities participating in the project to plan and implement sustainable, low-carbon, multi-modal transport solutions following an integrated, territory-based approach and (b) reduce the environmental impact of shipping and port operations through various environmentally-friendly, hard and soft solutions embedded into port action plans contributing towards a greener, safer and more efficient transport system.

Considering the [results](#) of focus group sessions that were conducted at each port at the start of the project, bringing together all relevant stakeholders of the respective port communities, a commonly accepted step-by-step [methodological approach](#) was devised (Figure 1) for supporting ports into developing their low-carbon action plans. The latter address different areas of intervention (Figure 2), covering a wide range of solutions that can be implemented for improving port environmental performance and mitigating associated impacts. During the process of developing those plans, the SUPAIR ports had the opportunity to visit two best-practice, sustainable ports in Europe (i.e. the ports of Barcelona and Gothenburg), which were selected following a carefully structured [methodology](#) and considering a set of properly defined criteria. Valuable insights and targeted information were gained from these visits, better informing in that way the action plans with regard to implementation risks and issues that may require a greater attention to be placed by port authorities.

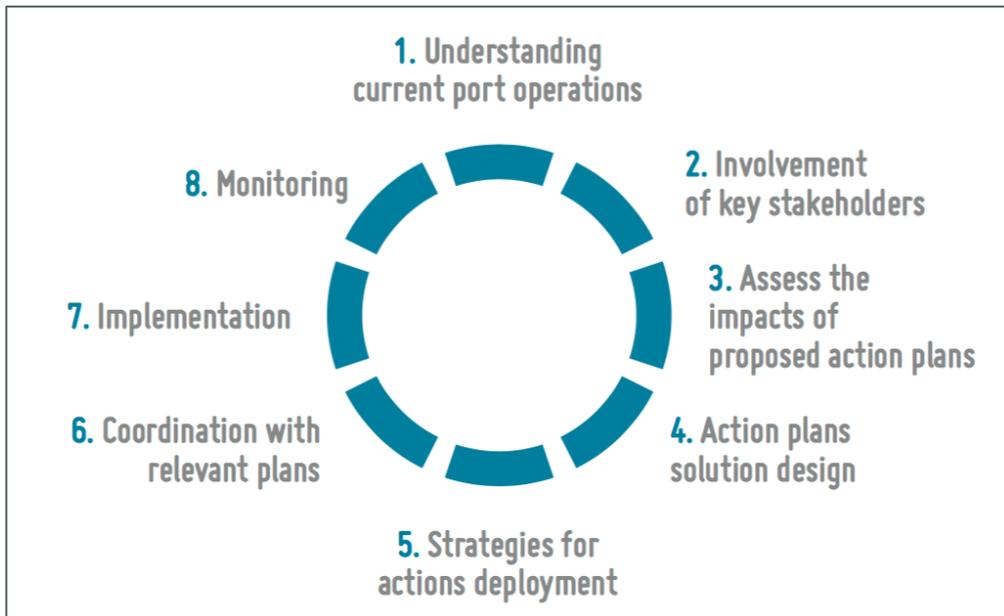


Figure 1 – The steps followed by the ports for developing their low-carbon action plans

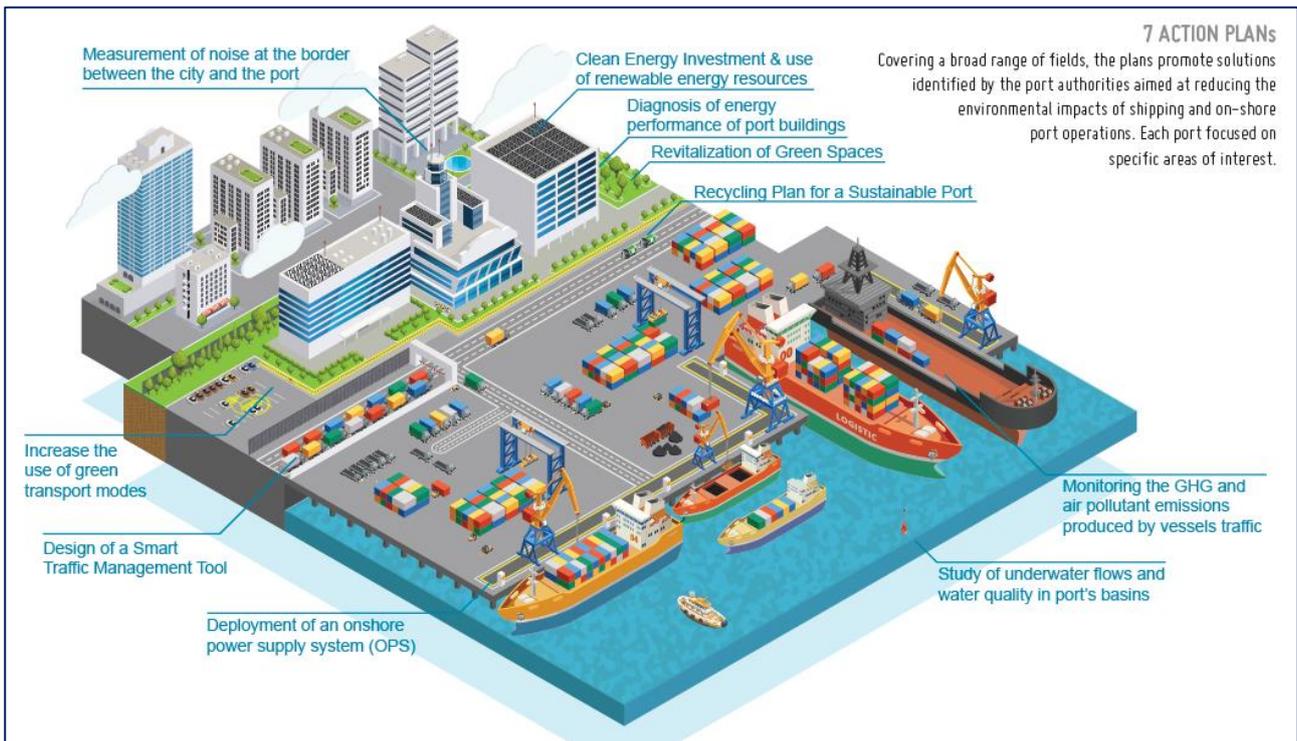


Figure 2 – The intervention areas addressed by the 7 low-carbon action plans of the SUPAIR ports

For sustaining the cooperation established between ADRION ports within the framework of the SUPAIR project and extending it to other ports in the Adriatic-Ionian region, thus supporting the implementation and transferability of the solutions investigated at each port, a ‘*Network of ADRION Sustainable and Low-Carbon Ports*’ was formally established. The latter serves as a key outcome of the project and follows the preparation and signature of a Memorandum of Understanding (MoU) by the SUPAIR partners and other actors interested to join the Network. The MoU aims to ensure the successful operation of the Network beyond the lifetime of the project, providing the necessary rules and procedures for its effective continuation.

The present document sets the ‘**Transnational Strategy for low-carbon transport systems in the Adriatic-Ionian basin**’ which accompanies the MoU and will support the aforementioned Network by illustrating the

long-term goal of designing and implementing sustainable low-carbon action plans within ports, setting in that way a detailed path for moving towards carbon-neutral port operations. To this end, the rest of the document is structured as follows: the main challenges to be addressed are being summarized first, providing the basis for setting the strategy’s vision, objectives and priorities; the alignment of the latter with existing policies at European but also regional and national level is being described next; a methodology and a work plan for progressing towards meeting the targets that have been set is provided last building upon the final outcomes of the SUPAIR project and highlighting key lessons learnt within its course.

2. Transnational strategy for low-carbon transport systems in the Adriatic – Ionian basin

2.1 The challenge

With several European ports, especially within the Mediterranean region, being in very close proximity to urban settlements, the environmental impact of both shipping and port operations to the surrounding urban community needs to be carefully monitored and mitigated, so that any potential effects on public health can be minimized.

Ports in Europe have been undertaking tremendous and continuous efforts towards enhancing their environmental performance with significant progress already achieved, but with a long way being still ahead. Figure 3 that follows summarizes the environmental priorities of European ports over the last 15 years, with air quality and energy consumption ranking at the top for the last four consecutive years.

2004	2009	2013	2016	2017	2018	2019
Garbage / Port waste	Noise	Air quality				
Dredging operations	Air quality	Garbage / Port waste	Energy consumption	Energy consumption	Energy consumption	Energy consumption
Dredging disposal	Garbage / Port waste	Energy consumption	Noise	Noise	Noise	Climate change
Dust	Dredging operations	Noise	Relationship with the port community	Water quality	Relationship with the port community	Noise
Noise	Dredging disposal	Ship waste	Garbage / Port waste	Dredging operations	Ship waste	Relationship with the port community
Air quality	Relationship with the port community	Relationship with the port community	Ship waste	Garbage / Port waste	Port development (land)	Ship waste
Hazardous cargo	Energy consumption	Dredging operations	Port development (land)	Port development (land)	Climate change	Garbage / Port waste
Bunkering	Dust	Dust	Water quality	Relationship with the port community	Water quality	Port development (land)
Port development (land)	Port development (water)	Port development (land)	Dust	Ship waste	Dredging operations	Dredging operations
Ship discharge (bilge)	Port development (land)	Water quality	Dredging operations	Climate change	Garbage / Port waste	Water quality

Figure 3 – Top 10 environmental priorities of European ports over the last 15 years (ESPO, 2019)

The EcoPorts network of the European Sea Ports Organization (ESPO) has substantially facilitated the intensification of relevant efforts by raising awareness, increasing best practice visibility and providing European ports with appropriate tools (i.e. Self-Diagnosis Method and Port Environmental Review System) that can support them into better managing environmental impacts and identifying appropriate actions to

be taken for reducing them. Although approximately 72% of European ports already have an environmental policy in place, and 69% of them have established dedicated departments staffed with environmental specialists, only 53% prove to have adopted an environmental management system that allows for a more efficient monitoring and consequently the improvement of current environmental performance (PwC & Panteia, 2013).

With substantial investments being undertaken in Mediterranean ports, including the ones located in the Adriatic – Ionian region, and with larger freight volumes being currently attracted and required to be handled, efficient environmental planning is an important prerequisite so that ports can grow in a sustainable manner and effectively contribute towards the further ‘greening’ of modern supply chains that they are an integral part of. This is the main challenge that this Strategy aims to address and to this end, its overall vision and mission is being set below. The latter comprises of a number of specific objectives to be achieved while certain guiding principles aiming to effectively steer the efforts of the SUPAIR network towards the key priorities that have been set are being also put forward.

2.2 Vision, mission and objectives

Taking into consideration the aforementioned challenge that European ports jointly face, but also paying specific attention on regional characteristics and conditions, as well as on opportunities that ADRIION ports can commonly exploit, the Strategy’s vision can be effectively summarized into the following statement:

Advance towards carbon-neutral and zero-emission port operations, supporting the development of sustainable transport systems in the Adriatic – Ionian region, as well as the further greening of modern supply chains, contributing in that way towards successfully mitigating climate change impacts and further boosting economic and social development in the region.

For going down this pathway, a number of specific objectives are set below delineating more clearly the intermediate goals to be achieved:

- Monitor operational performance of ADRIION ports (e.g. through the use of properly defined KPIs) and identify areas / opportunities for improvement,
- Monitor investments (e.g. on port / terminal infrastructure, equipment, etc.) and business developments in the region, and assess their impact on port performance and competitiveness collectively (i.e. as a multi-port region) and/or at individual port-level,
- Set-up port environmental policies, as an integral part of the overall policy of ADRIION ports, taking also into account available planning instruments and policies at local, national and regional level, so that efforts of the extended port communities can be better coordinated and expected benefits can be maximized,
- Assess current environmental and energy performance (e.g. through audit schemes) and set-up proper management systems, following global standards, for monitoring environmental impacts thus better inform in that way, environmental planning,
- Following an integrated, territory-based approach, further strengthen the capacity of ADRIION ports to efficiently plan, implement and monitor sustainable, low-carbon, multi-modal transport solutions (both hard and soft) for reducing the environmental impact of shipping and port operations,
- Foster increased collaboration / cooperation between ADRIION ports, facilitating knowledge and experience sharing as well as the creation of synergies for advancing progress towards addressing this common challenge of environmental sustainability and decarbonization.

- Foster increased collaboration / cooperation between ADRION ports and other stakeholders of the transport chain (e.g. shipping companies, road transport operators, rail transport operators, freight forwarders, etc.) so that greening efforts are efficiently propagated, generating benefits for all actors involved.

2.3 Guiding principles

As mentioned above, the Strategy aims to act as a robust pillar to the *Network of ADRION Sustainable and Low-Carbon Ports*, which is expected to be enlarged over the next few years, including additional ADRION ports and other port-related stakeholders as members, so that a critical mass is gathered and the added value of Network activities is further enhanced. To this end, a number of guiding principles aiming to support Network members in the roll out of the Strategy are being outlined below, structured around three main pillars (Figure 4).

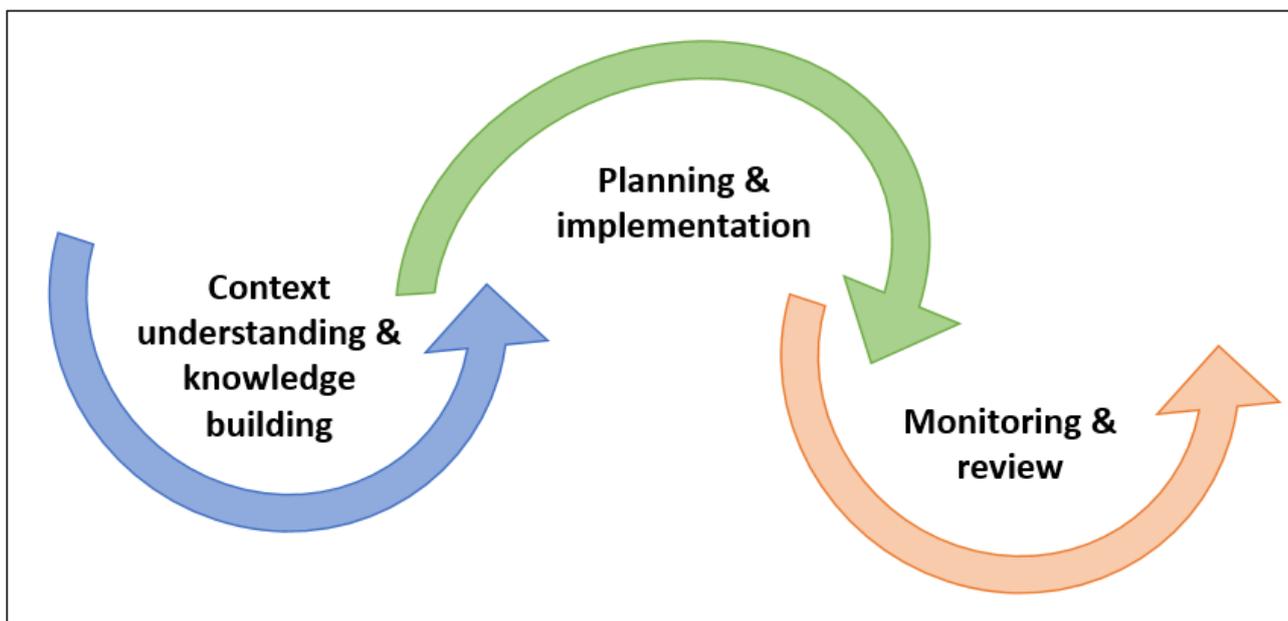


Figure 4 – Pillars of guiding principles supporting Network members in the roll out of the Strategy

Context understanding and knowledge building

The first step for the roll out of the Strategy is to have a good understanding of the reasons that have driven its development. Environmental impacts are increasing and becoming more severe, with tremendous effects on quality of life. Climate change is a reality and the relevant implications in everyday life and work are evident. All sectors of the economy should comprehend their respective share (existing and projected) and set-up proper policy frameworks for moving towards sustainable future.

Transportation is one of the sectors with the largest impact on the environment, accounting in 2017 for 27% of total greenhouse gas emissions (GHG) in EU-28. Despite a decline between 2008 and 2013, mostly attributed to a downturn in demand as a result of the global financial crisis, emissions from transport prove to have increased by 28% compared to 1990 levels. Road transport is the heaviest emitter, with maritime transport accounting in 2017 for 13.3% of total transport emissions (EEA, 2019).

To this end, both shipping and ports have an important role to play in this global strive for a cleaner planet for all. Port authorities and port-related stakeholders, that are the main target group of the SUPAIR project, should be well aware of their respective positioning within the aforementioned context, adopting new development approaches where sustainability lies as a key priority equally treated among others. Modern

supply chains are currently transiting into 'green' ones meeting consumers' requirements who are gradually providing a greater value to green-labelled products. Such a global effort is expected to reduce the impacts of climate change, which from an economic perspective will require heavy investments in the future so that the current infrastructure can efficiently adhere to new environmental conditions (e.g. rising sea level).

Planning and implementation

Once this overall context, the positioning of the sector as a whole as well as the role of each stakeholder and the relevant implications are better understood, not only by senior personnel but also by medium- and low-skilled workers, appropriate actions plans should be set so that all existing environmental impacts are mitigated to the best possible extent. This process should follow a step-by-step approach as highlighted in Figure 1 that can assist in answering the following questions: **WHAT** are the main environmental impacts that need to be addressed? **WHICH** are the main sources of pollution? **WHO** is involved in the relevant processes? **WHAT** solutions can be adopted (e.g. technological, operational, etc.)? **HOW** can other initiatives / actions / actors assist towards such a goal so that the combined impact is maximized and not reduced due to contradictory implications?

As mentioned above, action plans should be perfectly aligned with existing policy frameworks and regulations at all different levels (i.e. international, European, regional, national, local and internal) highlighting their potential contribution to the relevant goals that have been set as well as other benefits that may be derived. With sustainability serving as a common goal, as stressed out above, best practice knowledge and experience sharing is of vital importance so that implementation risks can be avoided leading to reduced costs thus ensuring that the expected benefits are realized in a timely manner. Network formations can play a key role in that regard facilitating relevant information sharing and the creation of leader-follower duos. Furthermore, increased visibility of the action plans should be ensured, at all different implementation stages, so that all relevant stakeholders are fully aware of them and can follow their timeline, so that wide consensus can be reached.

Monitoring and review

Once implementation has been completed and the foreseen measures have become operational, a structured and detail monitoring plan should be put in place for effectively guiding the performance assessment process, pointing out misalignments from the expected goals and enabling the identification of corrective actions so that the expected benefits are successfully achieved at the planned time framework. Such a process is of crucial importance and should be as analytical as possible (e.g. exploiting a wide set of relevant Key Performance Indicators) while the relevant personnel should be competent enough to timely adopt proper solutions for addressing possible problems that may be encountered or boosting low performance. Any operational or other risks should have been identified beforehand and contingency measures should have been planned so that response time and the associated negative impact can be minimized. The review process can periodical or even real-time, according to the specificities of each case, and frequent improvement cycles should be planned and undertaken.

3. Alignment with relevant policy frameworks and regulations

The "Transnational Strategy for Low-Carbon Transport Systems in the Adriatic-Ionian basin" is well-aligned with all relevant policy frameworks, regulations and strategies that have been introduced at all different levels i.e. international, European, regional and national. The most important ones are being briefly outlined below. It should be noted at this point that national policies correspond to those countries that are being

represented within the SUPAIR Network by at least one representative. Therefore, since the process of enlarging the Network will be a continuous one, this report can be regarded as a living document that will be updated in due course.

3.1 International policies

With shipping emissions representing the main source of air pollution at port areas (70%), the following two new regulations of the International Maritime Organization (IMO) are of particular importance to the port sector as well:

- *MARPOL Convention – Annex VI (Prevention of air pollution from ships)*: As of the 1st of January 2020, a new, stricter global limit has been set for the sulphur content of ships' fuel oil. More specifically, the latter was reduced from the previous 3.5% m/m to 0.5% m/m, with significant environmental benefits expected to be realized
- *Initial IMO Strategy to reduce GHG emissions from ships*, which sets the pathway towards the decarbonisation of international shipping. More specifically, three specific targets are set within the strategy: (i) reduction of CO₂ emissions per transport work by at least 30% by 2040 pursuing efforts towards 70% by 2050, compared to 2008, (ii) reduction of total annual GHG emissions by at least 50% by 2050 compared to 2008, and (iii) strengthening of the energy efficiency requirements for new ships, within the context of the Energy Efficiency Design Index (EEDI) and for existing ships within the context of the Ship Energy Efficiency Management Plan (SEEMP).

3.2 European policies

The European Commission has also set a number of European policies focusing on sustainability issues addressing different sectors or emphasizing particularly on the port sector.

The *European Green Deal* is the more recent one (December 2019). It is a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern resource-efficient and competitive economy where there are no net emissions of GHGs in 2050 and where economic growth is decoupled from resource use (EC, 2019). The Green Deal is an integral part of the Commission's strategy to implement the United Nation's 2030 Agenda and the Sustainable Development Goals¹. In the relevant communication, an initial roadmap of key policies and measures needed to achieve the Green Deal are presented, structured around its key elements as these are depicted in Figure 5 below.

¹ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

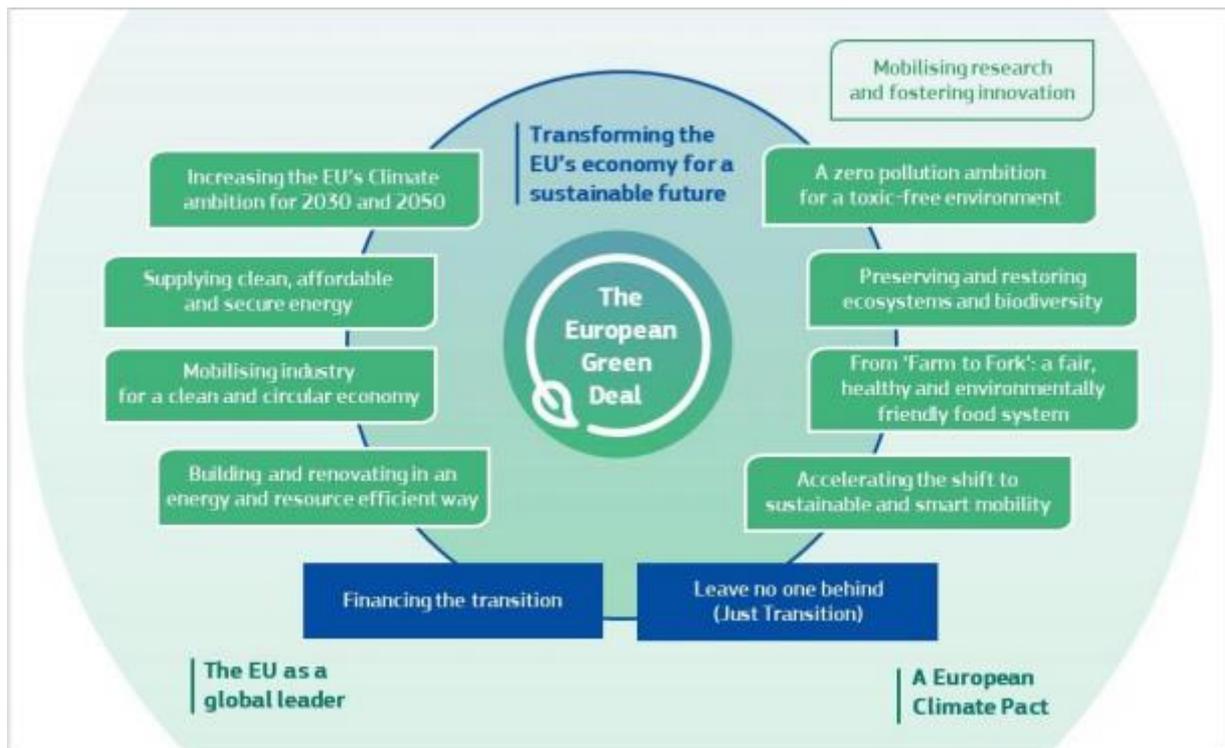


Figure 5 – The key elements of the European Green Deal

The European Commission has also set, through its strategy “*A clean planet for all*”, a clear vision of how to achieve a climate neutral economy by 2050, looking at all key sectors and exploring pathways for the transition. This vision covers nearly all EU policies and is in line with the Paris Agreement objective to keep the global temperature increase to well below 2° C and pursue efforts to keep it under 1.5° C. This vision also formed the basis for the “Long-term low greenhouse emission development strategy of the EU and its Member States²” that the EU submitted to the United Nations Framework Convention on Climate Change in March 2020. In order to clearly set out the conditions for an effective and fair transition, to provide predictability for investors and ensure that the transition is irreversible, the European Commission also proposed on March 4, 2020 the first “*European Climate Law*³”. This aims to enshrine the 2050 climate neutrality objective in legislation. The European Climate Law is expected to ensure that all EU policies contribute to the climate neutrality objective and that all sectors play part.

Focusing more on the shipping and port sector, and in line with the IMO regulations mentioned above, the European Commission has also issued two key relevant policies: the *Sulphur Directive* (Directive 1999/32/EC and its amendments) and the *Monitoring, Reporting and Verification (MRV) Regulation* (Regulation 2015/757 and Commission Delegated Regulation 2016/2071). The first establishes limits on the maximum sulphur content of marine fuels, providing some additional fuel-specific requirements for ships calling at EU ports. However, it does not include any provision for regulating shipping emissions of NOx and PM. The Directive has been also coupled with a ‘Sulphur Inspection Guidance’, issued by the European Maritime Safety Agency (EMSA) (latest version published on May 2018), which describes the sulphur inspection sequence distinguishing the following three phases i.e. pre-boarding, on-board and follow-up. With regard to GHG emissions, the EC set out in 2013 a strategy for progressively integrating maritime emissions into the EU policy for reducing domestic GHG emissions. The strategy consists of three consecutive steps: (a) monitoring,

² <https://unfccc.int/documents/210328>

³ https://ec.europa.eu/clima/policies/eu-climate-action/law_en

reporting and verification of CO₂ emissions from vessels over 5.000 GT using ports of the European Economic Area (EEA), (b) GHG reduction targets for the maritime transport sector and (c) further measures, including market-based ones, in the medium and long term. Starting from the 1st of January 2018, shipping companies are required to monitor their ships' CO₂ emissions, fuel consumption and other relevant parameters, gathering the annual data into an emissions report, submitted to an accredited MRV shipping verifier. Furthermore, as of April 2019, shipping companies having performed EEA related maritime transport in the previous reporting year, shall submit a verified emissions report to the EC through a new module introduced in the Port State Control Inspection Database – THETIS called THETIS MRV. The latter will issue a Document of Compliance which ships, having performed activities in the precedent reporting period and visiting EEA ports, will be required to carry on board as from June 2019. This obligation may be subject to inspections by Member States' authorities.

At the port level per se, the *Port Services Regulation* consists of the first port specific regulation of the EU (European Parliament, 2017). It establishes a framework for the provision of port services and the use of port infrastructures aiming at improving financial transparency and charges in ports. Its content also extends to issues of environmental sustainability as it encourages port authorities to establish a minimum set of requirements for the provision of port services in order to ensure and promote high environmental performance, energy efficiency and carbon efficiency of transport operations both inside the port area and from the waterway access to the port. Furthermore, it allows to differentiate port infrastructures charges depending, among others, also on environmental criteria, thus obliges port authorities to offer environmental consultation to port users and other relevant stakeholders.

3.3 Regional policies

At a lower level, relevant regional policies have also been introduced considering also business-related trends and new forms of port competition, with several ports within the European port network cooperating with each other for attracting freight flows from other multi-port regions within the European context.

The *EU Strategy for the Adriatic and Ionian Region* (EUSAIR) covers the region addressed by the SUPAIR project and thus its relevant targets and priorities are fully aligned with this Transnational Strategy for low-carbon transport systems in the Adriatic-Ionian basin. More specifically, EUSAIR is a macro-regional strategy covering both EU and non-EU countries⁴, with the aim to promote economic and social prosperity in the region considering four strategic pillars, i.e. (i) Blue growth, (ii) Connecting the region, (iii) Environmental quality and (iv) Sustainable tourism (European Commission, 2014).

The most relevant to maritime transport is Pillar 2, which aims at improving connectivity within the region as well as the rest of Europe in terms of transport and energy networks. As noted within the introductory section, the SUPAIR project, and thus this Transnational Strategy, falls within the framework of the 'Connecting the region' pillar where the topics of the latter on 'maritime transport' and 'intermodal connections to the hinterland' highlight the development of short sea shipping as well as rail transport and inland waterways as a sustainable alternative to road transport that proves to be dominating freight transport and distribution from ports to major European markets. In addition to maritime safety and security, investment in innovation, modernisation of infrastructure and the reduction of procedural and bureaucratic constrains in port operations, it is highlighted that any extension of the current infrastructure and any transport activities should be accompanied by sustainability transport plans, which need to be in accordance with the Air Quality Directive 2008/50/EC. EUSAIR also highlights existing inefficiencies and gaps in current maritime-related systems (i.e. ADRIREP, VTMS) which need to be carefully addressed, while promotes the

⁴ Among the countries included in this macro-region are Croatia, Greece, Italy, Slovenia, Albania, Bosnia and Herzegovina, Montenegro and Serbia.

development of the South East Mediterranean Motorway of the Sea Master Plan with the aim to further improve existing maritime links and infrastructure or establish new viable links for the transportation of freight and goods. The strategy presents also its objectives for energy networks, according to which the development of LNG infrastructure in ports can facilitate the development of an efficient bunkering network attracting global demand.

3.4 National policies

Transport and port policies at national level, as well as the research and innovation strategies for smart specialisation (the so-called RIS3) that have been developed over the past few years are also of particular relevance to this Transnational Strategy, since they roll-out specific objectives and guide developments at each country. However, the latter need to present a certain level of coordination so that expected benefits are combined and maximized. Business networks can play a role in the formation / consultation of such policies providing expert input and guidance.

For the countries represented in the SUPAIR Network by at least one member, the key national policies are being briefly outlined below.



Greece

The Greek Ministry of Shipping and Insular Policy is in the process of *updating the previous National Port Strategy (2013-2018)*, which will now form an integral part of the *National Logistics Strategy*, going in line with the latest business and market-related developments. The new strategy, and the related policy, are focusing on the upgrade of Greek ports into major hubs, driving in that way national and regional economic growth. Large-scale investments in Greece's two largest ports (i.e. Piraeus and Thessaloniki) have already been made and are still ongoing and planned, while bids for private investments in 10 other large Greek ports are being scheduled in the near future. Besides economic and business developments, emphasis is also provided on environmental sustainability, with relevant controls covering (i) the safe loading/unloading of goods, (ii) appropriate management of ship waste, (iii) vessel speed control within the port, (iv) accidents minimization and risk reduction of oil spills, (v) reduction of air emissions and use of low sulphur fuel oil, (vi) protection of recreational activities within and around ports, (vii) land management of container handling zones, (viii) port expansion effects on local fauna, (ix) dredging activities and management of relevant waste and (x) rise of sea level in the Mediterranean region. Within the context of the above, enhancing the ports' inter-modality and interconnectivity for reaching the central European market in a sustainable way through hinterland corridors in the Balkans is also considered as a major priority and a precondition for national and regional development.

Greece has also developed a RIS3 national strategy as well as 13 more specific strategies addressing each one of its regions. Maritime transport and especially ports hold a key role in these strategies, being efficiently integrated in the transport and logistics sector. The national strategy stresses out the role of maritime transport in the country for connecting inland with islands regions and ensuring in that way social cohesion. It also identifies key issues driving the development of sustainable ports such as the use of smart port infrastructure and IT systems (e.g. Port Community Systems, energy monitoring systems, air emissions measuring stations, etc.). Two regional strategies i.e. that of Attica and Central Macedonia, where Greece's two largest ports (i.e. Piraeus and Thessaloniki respectively) are located, also highlight relevant areas for intervention and development. More specifically, in the Attica region, the strategy highlights the existing weaknesses of the regional maritime cluster which mainly relate to (i) its low level of competitiveness, (ii) the lack of port infrastructure, (iii) lack of shipbuilding zones, (iv) unsuitable or insufficient legislative

framework and (v) lack of available maritime support services. For addressing these weaknesses, concrete solutions are being provided (Logotech, 2015). These mainly relate to (a) the upgrade of the Port of Piraeus into a gate for tourism, improving accessibility to and from the city, (b) the redevelopment of the overall area and the sea zone of the Port of Piraeus, (c) the development of additional tourist ports in the region and the establishment of interactions with business centers located in the cities of Perama and Drapetsona, and (d) the provision of services for accommodating yachts and mega-yachts (Logotech, 2015).

In the RIS3 strategy of Central Macedonia, the role of the port of Thessaloniki is being stressed out, since the latter is identified as a major gateway for the country's imports and exports being connected, via rail, to central European markets. The strategy's relevant priorities relate mainly to improvements in infrastructure and multimodality, exploiting relevant knowledge from other sectors and focusing on enhancing the use of alternative fuels and renewable energy sources (Region of Central Macedonia, 2015).



Italy

Port legislation in Italy was reformed in 2016 with the No. 169 legislative degree entitled "*Reorganization, rationalization and simplification of the regulations concerning the Port Authorities*"⁵. In particular, Article 5 introduced Article 4 bis of Law 84 of 28 January 1994 which, for the identified 15 System Authorities (that became 16 on December 2018⁶ adding the Port Authority of the Strait of Messina with jurisdiction on the ports of Messina, Milazzo, Reggio Calabria and Villa San Giovanni) provides that the relevant planning must respect energy and environmental sustainability criteria. To this end, the Italian Port System Authorities ("AdSP") promoted the drafting of the Planning Document (DEASP), following a dedicated set of guidelines.

More specifically, on December 2018, the Italian Ministry of Environment and for the Protection of Land and Sea published the "*Guidelines for the drafting of Energy-Environmental Planning Documents of Port Systems – DEASP (the "Guidelines")*"⁷. The Guidelines regulate the Planning Document (DEASP) structure, the method for measuring CO₂ emissions of the port system (providing also examples of interventions for their reduction), and the method to carry out a cost-benefit analysis ("CBA")⁸. The proposed structure of DEASP includes the following: (i) premises, containing the main legal basis of references, examples of best practices and a holistic description of the underpinning vision on sustainability, (ii) general framework, addressing morphological characteristics, institutional nature and planning, etc., (iii) state-of-the-art description, containing the description of the CO₂ emission status, (iv) standardized form for annual updates, containing the description of potential interventions or measures to monitor the performance of interventions on an annual basis specifying data to be used for evaluating the reduction of CO₂ emissions, (v) technical components, containing key concepts related to interventions (i.e. works, plants, infrastructures) and measures (i.e. state of implemented solutions and achieved results through rules, priorities, incentives, etc.), (vi) feasibility evaluation framework, containing the CBA based on national relevant rules (D.Lgs 228/2011⁹) and the European framework of reference (CBA Model DG-REGIO, 2014), and (vii) graphical elaboration, containing graphical tools to support monitoring of the addressed measures and interventions.

⁵ <https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2016-08-04;169>

⁶ www.gazzettaufficiale.it/eli/id/2018/10/23/18G00151/sg

⁷ https://www.minambiente.it/sites/default/files/archivio/notizie/CLE/lg_deasppfinale.pdf

⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32015R0207&from=IT>

⁹ Legislative Decree n. 228, 29 dicembre 2011, "Attuazione dell'articolo 30, comma 9, lettere a), b), c) e d) della legge 31 dicembre 2009, n. 196, in materia di valutazione degli investimenti relativi ad opere pubbliche", <https://www.gazzettaufficiale.it/eli/id/2017/01/13/17G00005/sg>

Through the DEASP, the AdSP will define “strategic directions for the implementation of specific measures”, with the aim to improve energy efficiency and promote the use of renewable energies in the port area. More specifically, these directions relate to (a) interventions (i.e.: plants, facilities, structures and works), and measures (i.e.: introduction of emissions standards in the authorizations issued to operators, granting of benefits, application of incentives schemes etc.) to be enacted, (b) coordination strategies between interventions and environmental measures with the planning of infrastructural interventions in the port system, and (c) adequate energy and environmental measures monitoring interventions to understand their efficiency.

The AdSP community as well as the other players of the system falling within the port network context, as defined by the Port Master Plan, will be involved in the preparation of the DEASP. This includes terminal operators and commercial and industrial stakeholders as well as vessels engaged in mooring operations among the sources of energy consumption and of CO₂ emissions data collection. In this regard, it is expected that the AdSP will adopt an inclusive approach to work with the “system” stakeholders mentioned above (first of all, terminal operators), asking them to provide specific information relating to facilities existing in their sites, as well as data on developed power capacity (kW) and on fuel consumption by their own operational means. In light of the data collected, the AdSP, within the determination of emissions reduction targets, may then begin liaising with operators in order to evaluate the possibility to implement interventions / investments aimed at achieving the above-mentioned environmental benefit targets. According to the Guidelines, intervention proposals, depending on the category of interventions, are all subject to the application of the CBA, which must take into account both social and environmental aspects.



Montenegro

Montenegro’s newest *Transport Development Strategy 2019-2035*¹⁰ was finalised and adopted in June 2019. The Strategy provides an overview of the current status of the transport sector in the country including also the most important plans that have been devised for the future. Considering that having an effective and efficient transport system in place is an important prerequisite for the economic prosperity of Montenegro, existing problems, bottlenecks and/or limitations, lack of funding for ensuring adequate infrastructure maintenance, and an outdated railway system, are all having a negative impact on the country’s socio-economic development. To this end, Montenegro is currently planning major overhauls of its road and rail networks, and a further valorisation of its maritime system.

Within the aforementioned strategy, it is highlighted that the port of Bar serves as the only intermodal station between rail and maritime transport, and as a starting point for the Bar-Belgrade railway. However, railway connecting segments between the port piers and the railway network are insufficient. Furthermore, intermodal infrastructure is insufficient. More specifically, the capacity of railway lines is not fully exploited, and road transport undertakes the majority of containerized freight flows. Considering that inter-modality has not been addressed by the current strategies in Montenegro, there is a need to perform an analytical relevant study on inter-modality, examining the current state of affairs in the country and proposing activities which can lead to the development of a fully-fledged intermodal transport system. On the basis of such a study, steps could be taken towards intermodal infrastructure development. More specifically, a study of this type would analyse all advantages and disadvantages of intermodal transport in contrast to unimodal transport. In essence, the study would enable to highlight the significance of the intermodal system, its main principles and technologies needed, as well as the advantages and disadvantages of specific transport links.

¹⁰ <http://www.msp.gov.me/en/library/strategije>

As a result, and considering the present economic and transport conditions, specific directions and development perspectives can be provided. Intermodal transport development will alleviate road transport congestion, improve environmental congestion and decrease overall costs.

With regard to the port system in Montenegro, a number of projects have been planned within the framework of the Transport Development Strategy. These relate to:

- Improving connectivity in the port of Bar (i.e. improve rail connections and expand piers and the passenger terminal)
- Revitalize and/or upgrade transport infrastructure in maritime transport (i.e. increase transshipment of general cargo and containers by securing the status of a transshipment port, expand capacity for the transshipment and storage of dry bulk cargo on the northern slope of Volujica hill, increase transshipment of liquid and bulk cargo)
- Establish and exploit Intelligent Transport Systems – ITS (e.g. VTMISS)

With regard to the above, the Strategy has also set specific performance indicators to be monitored setting a 2018 baseline and two target values for 2027 and 2035. More specifically, for the aforementioned three projects, the following indicators have been set respectively:

- (i) Increase capacity, and (ii) operational income of the port of Bar
- (i) Volume of transshipment of general cargo and containers in the port of Adria, (ii) volume of transshipment of bulk cargo in the Port of Bar, and (iii) volume of transshipment of liquid cargo in the Port of Bar.
- Coverage level of ITS systems in the maritime network (VTMISS)



Slovenia

No specific regulation in Slovenia addresses port sustainability, but all major interventions in the port areas need to be accompanied with actions for monitoring and mitigating the resulting environmental impacts. More specifically, all port action plans need to be in line with the Environmental Impact Assessment Regulations which include:

- The Environmental Protection Act¹¹
- Regulation on the types of environmental intervention for which an environmental impact assessment is to be carried out¹²
- Regulation on the content of the report on the effects of the intended intervention on the environment and the method of its preparation¹³
- Rules on the assessment of the acceptability of the effects of the implementation of plans and interventions in nature on protected areas¹⁴

Of course the Slovenian law is also aligned with all relevant EU Directives addressing climate change impacts, environmental protection, energy efficiency, etc.

¹¹ <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1545>

¹² <http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6527>

¹³ <http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV8124>

¹⁴ <http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV5539>



Albania

On the policy side and with regard to the transport sector in Albania, the most recent developments can be summarized to the following:

- *Albania Transport Sectoral Strategy 2016-2020*¹⁵
- *Albanian National Transport Plan (ANTP 3)*, its 2nd review was recently completed
- *Transport Community Treaty*: the signing of the Transport Community Treaty from WB6 Prime Ministers in High Level Summit of Trieste on the 12th of July 2017 represents the most significant achievement in the regional cooperation in the transport sector during the last 10 years (ratified by law No.8/2018, 26.02.2018)

The overall objective of the National Transport Strategy and the Action Plan is to further develop the country's transportation system and improve interconnectivity, interoperability and integration with the European transport system. It is fully aligned with the National Strategy for Development and Integration 2015-2020 and other cross-cutting strategies as well as the main concepts of the European Transport Policy.

With regard to maritime transport, two strategic priorities are set:

- (a) Develop efficient and responsive maritime and port systems, including the following actions:
 - Ratify and endorse IMO regulations and EC rules
 - Establish a roadmap to approximate and accompany IMO and EC regulations
 - Support VTMISS implementation
- (b) Support sustained growth for maritime and port markets, including the following actions:
 - Rehabilitate and modernize port infrastructure and services
 - Support and promote nautical tourism
 - Develop and promote maritime labour markets

With regard to the aforementioned actions, the following developments have been undertaken: (i) The regulation on the implementation of the ISM Code in the Republic of Albania has been approved, (ii) The roadmap to approximate EC regulations has been drafted in compliance with the Annex of the Transport Community Treaty, (iii) Several projects are ongoing for the rehabilitation of the infrastructure and superstructure of the ports in order to increase the volume of cargo and the number of passengers.



Croatia

The Republic of Croatia has set its main strategic objectives with regard to maritime transport in its *Strategy of Maritime Development and Integrated Maritime Policy (2014-2020)*¹⁶. The strategy encourages integration and innovation in Croatian ports aiming at supporting sustainable growth and enhancing the competitiveness of the maritime economy, thus ensuring safety and environmental sustainability. These key objectives extend to shipping and maritime transport services, port infrastructure and services, nautical tourism, as well as to the education and labor and living conditions of seafarers. With regard to the aforementioned sector, particular emphasis is being provided on: enhancing the competitiveness of maritime transport and nautical tourism at both national and international level, improving the quality of services and level of security provided to passengers but also with regard to freight transport, encouraging port specialization, increasing

¹⁵ Decision of Council of Ministers No. 811 of 16.11.2016 "On the approval of the Transport Sector Strategy and its Action Plan 2016-2020"

¹⁶ <http://www.csamarenosturum.hr/userfiles/files/Nacion%20zakon%20engl/MDIMP SRC.pdf>

self-sustainability and the efficiency of port systems and constructing new or modernizing existing port infrastructure. These objectives are also mentioned in the long-term transport strategy of Croatia (*Transport Development Strategy of the Republic of Croatia (2017 – 2030)*¹⁷), which also focus on the integration of ports into local transport systems considering both passengers and freight.

In addition, the *Croatian Smart Specialization Strategy 2016-2020*¹⁸ includes maritime transport and ports into its thematic priority of transport and mobility, encouraging especially research, development and innovation in added-value manufacturing and environmentally friendly solutions (especially in shipbuilding) as well as the creation of maritime clusters.

The State's maritime policies, strategies and legislation is also aligned with international and regional regulations, with the most recent of them being the *2019 Amendment to Croatian Maritime Code establishing modern regulatory framework for implementation of high standards of environmental protection* and the promotion of the development of green ports¹⁹.

4. Strategic initiatives to be exploited

A number of relevant strategic initiatives exist at international, European and regional level, that the SUPAIR Network should be aware of and should look into developing synergies with since several network members are also part of them. These are being briefly outlined below and are acknowledged by this Strategy considering the significant contribution they are making in facilitating knowledge and experience sharing, fostering the creation of partnerships, showcasing best practices while also offering, in some cases, specific tools that the ports can use for better managing and monitoring their environmental and energy performance.

World Port Sustainability Program

The World Port Sustainability Program²⁰ is a joint initiative of The American Association of Ports and Harbors (AAPA), the European Sea Ports Organisation (ESPO), The Worldwide Network of Port Cities (AIVP), the World Association for Waterborne Transport Infrastructure (PIANC) and the International Association of Ports and Harbors (IAPH) and aims to promote the collaboration between the main actors of the port industry and business, governmental and societal stakeholders for supporting sustainability in the port regions. The program implements the UN Sustainable Development Goals²¹ in five main areas of interest namely the (i) Resilient infrastructure, (ii) Climate and energy, (iii) Community outreach and port-city dialogue, (iv) Safety and security and (v) Governance. The main objective of the World Port Sustainability Program is to contribute to the sustainable development of ports and port communities through the endorsement of best practices and the cooperation between the international port-related organizations (World Port Sustainability Program, 2020).

EcoPorts Network

¹⁷ https://www.kormany.hu/download/9/9f/11000/00_HR_kozlekedesfejlesztesi_strategia_EN.pdf

¹⁸ https://s3platform.jrc.ec.europa.eu/documents/20182/222782/strategy_EN.pdf/e0e7a3d7-a3b9-4240-a651-a3f6bfaaf10e

¹⁹ <https://www.lexology.com/library/detail.aspx?g=51aeefec-2770-409c-a773-21c76ddfa265>

²⁰ <https://sustainableworldports.org>

²¹ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

The EcoPorts²² initiative was established in 1997 by several European ports and has been fully integrated into the European Sea Ports Organization (ESPO) since 2011. It is the main environmental initiative of the European port sector which aims to support environmental protection through the promotion of cooperation and knowledge sharing between ports. The EcoPorts Network consists of 105 ports of different activities and sizes from 23 European countries that have assessed their environmental performance in relation to the performance of both the sector and international standards according to the European Sea Ports Organization's (ESPO) Ecoport Self Diagnosis Method (SDM). In addition, 26 of these ports are certified by the Lloyd's Register certification body for the organization of their environmental management system in accordance with the Port Environmental Review System (PERS) (Ecoports, 2020).

MEDports Association

The MEDports Association²³ is an initiative with 22 member ports, which represent about 70% of the total traffic passing through the Mediterranean. The Association aims to improve the efficiency and the competitiveness of Mediterranean ports by promoting their interests and the establishment of new maritime trade-links between them. The activities of the Association are determined from the six technical committees who are dealing with key issues related to the seas and ports like the relations with International Institutions, marketing statistics and analysis, employment, training and maritime expertise, *sustainability*, safety and security and smart ports (MEDports, 2020).

5. Recommendations

Considering the thematic clustering that has been undertaken in the ADRION programme, bringing together ADRION projects addressing complementary aspects and issues, it would be of great added value if this Transnational Strategy of SUPAIR is not regarded as totally independent but considered within a broader context where the different visions set by the strategies of the different ADRION projects contribute together and in a combined manner into supporting the region's further growth and prosperity, thus enhancing its trade attractiveness within global supply chains.

The SUPAIR project forms part of the Thematic Cluster on "Integrated multimodal sustainable water and land transport", along with the following projects:

- *ADRIPASS – Integrating multimodal connections in the Adriatic-Ionian region*²⁴, which aims to improve maritime hinterland connections by (a) analysing physical and non-physical bottlenecks in the regions TEN-T corridors and (b) testing specific ICT solutions for streamlining freight transport in ADRION ports
- *ISTEN – Integrated and sustainable transport in efficient network*²⁵, which aims at qualifying ADRION ports as strategic nodes and hubs in the region by setting up strategies for improving hinterland intermodal connections pushing in particular rail freight flows and last mile connections to TEN-T Corridors
- *NEWBRAIN – Nodes enhancing waterway bridging Adriatic – Ionian network*²⁶, which addresses infrastructural gaps and technological, procedural and organization bottlenecks impacting the

²² <https://www.ecoport.com>

²³ <https://medports.org>

²⁴ <https://adripass.adrioninterreg.eu>

²⁵ <https://isten.adrioninterreg.eu>

²⁶ <https://newbrain.adrioninterreg.eu>

smoothness of the regional transport system, and aims to stimulate the coordinated development of physical and non-physical infrastructure and enhance the capacity to launch relevant feasible investments

- *SUPER-LNG – Sustainability performance of LNG-based maritime mobility*²⁷, which aims to increase the level of safety, environmental quality and sustainability of LNG maritime transportation in the Adriatic Sea.
- *MultiAPPRO - Multidisciplinary approach and solutions to development of intermodal transport in the region*²⁸, which aims to support intermodal transport development by (a) analysing bottlenecks at national and regional level and providing appropriate solutions, (b) providing port quality measure indicators for assuring high quality of services, and (c) creating a model for measuring the effect of each new investment in a simple and logical way.

²⁷ <https://superlng.adrioninterreg.eu>

²⁸ <https://multiappro.adrioninterreg.eu>

References

- Adler, D., Wargan, P., and Prakash, S., (2019), *The Green New Deal for Europe. A blueprint for Europe's just transition. Draft report for public consultation*, <https://report.gndforeurope.com/cms/wp-content/uploads/2019/09/GNDE-A-Blueprint-for-Europes-Just-Transition.pdf>
- European Commission, (2012), *Guide to Research and Innovation Strategies for Smart Specialisations (RIS 3)*, <https://s3platform.jrc.ec.europa.eu/documents/20182/84453/RIS3+Guide.pdf/fceb8c58-73a9-4863-8107-752aef77e7b4>
- European Commission, (2014), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions concerning the European Union Strategy for the Adriatic and Ionian Region*, SWD(2014) 190 final, https://www.adriatic-ionian.eu/wp-content/uploads/2018/02/actionplan_190_en.pdf
- European Commission, (2018), *Communication from the Commission: A Clean Planet for all. A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy*, COM(2018) 773 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0773>
- European Commission, (2019), *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee Of The Regions concerning the European Green Deal*, COM(2019) 640 final, https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf
- European Environmental Agency, (2019), *Greenhouse gas emissions from transport in Europe*, <https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases/transport-emissions-of-greenhouse-gases-12>
- European Parliament, (2017), *Regulation (EU) 2017/352 of the European Parliament and of the Council of 15 February 2017 establishing a framework for the provision of port services and common rules on the financial transparency of ports*, OJ L 57, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R0352>
- European Sea Ports Organization, (2019), *ESPO Environmental Report 2019 – EcoPortsInSights 2019*, <https://www.espo.be/media/Environmental%20Report-2019%20FINAL.pdf>
- Logotech Ltd, (2015), *Strategy for Smart Specialisation for the Region of Attica*, <https://www.espa.gr/el/Pages/staticRIS3.aspx>
- Logotech Lts, (n.d.), *Strategy for Smart Specialisation for the Region of Epirus*, <https://www.espa.gr/el/Pages/staticRIS3.aspx>
- Ministry of shipping and Aegean, (2012), *National Port Strategy*, <https://docplayer.gr/607887-Ethniki-stratigiki-limenon-2013-2018-ypoyrgeio-naytilias-aigaioy.html>
- Official Government Gazette, (2002), *Measures and limits of port infrastructure for receiving ship generated waste or load generated waste*, Joint Ministerial Decision -3418/07/2002 (ΦΕΚ 712 Β'/11-06-2002), paper number 712, http://www.elinyae.gr/el/lib_file_upload/b712_2002.1127295074932.pdf

Official Government Gazette, (2009), Measures and limits of port infrastructure for receiving ship generated waste or load generated waste, KYA 8111.1/41/2009/25-02-2009 (ΦΕΚ Β' 412), <https://www.e-nomothesia.gr/kat-naytilia-nausiploia/ya-8111-1-41-2009.html>

Official Government Gazette, (2015), Approval of Smart Specialisation Strategy (2014-2020), paper number 1862, 27th August 2015, <https://www.espa.gr/el/pages/staticRIS3.aspx>

PriceWaterhouseCooper and Panteia, (2013), *Study Aimed at Supporting an Impact Assessment on: Measures to Enhance the Efficiency and Quality of Port Services in the EU*. Directorate-General for Mobility and Transport, European Commission, https://ec.europa.eu/transport/modes/maritime/studies/maritime_en

Region of Central Macedonia, (March, 2015), *Strategy for Smart Specialisation (RIS3) in the Region of Central Macedonia*, https://www.espa.gr/elibrary/RIS3_%20CE%9A%CE%B5%CE%BD%CF%84%CF%81%CE%B9%CE%BA%CE%AE%20%CE%9C%CE%B1%CE%BA%CE%B5%CE%B4%CE%BF%CE%BD%CE%AF%CE%B1_%2020150315.pdf