ECOWAVES

SWOT Analysis of available port regulations

PP3 - IGOUMENITSA PORT AUTHORITY S.A (GR)

February 2022

Project acronym:	ECOWAVES
Project name:	Enhancing Cooperation in Waste management from VESsels in ADRION ports
Project code:	1129

Document Information

Document ID name:	ECOWAVES_D. T1.4.1_ SWOT Analysis of available port regulations_20220208
Document title:	SWOT Analysis of available port regulations
Type:	Joint Report
Date of Delivery:	08 02 2022
Work package:	WP T1
Work package leader:	PP3 – IGOUMENITSA PORT AUTHORITY S.A. (GR)
Dissemination level:	Public

Document History

Versions	Date	Changes	Type of change	Delivered by
Version 1.0	10/2021	Initial Document	-	Igoumenitsa Port Authority SA – Living Prospects Ltd
Version 1.1	08/02/2022	Updated	PP2 Contribution	Igoumenitsa Port Authority SA – Living Prospects Ltd

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1. Introduction

This deliverable is elaborated in the context of the Work Package T1 - *Port Environmental Framework* / Activity T1.4 – *Transfer of knowledge for waste management planning in port area.*

The activity collects data on waste management in port areas by technical experts: site inspections of ADRION ports, surveys about the general state of the port waterways, capacity building with port authorities will be proper means to have an overall vision. All data will be collected to edit transnational policies which will assist ADRION programme countries in planning and providing adequate port waste management reception facilities. It will encourage them to develop appropriate methods of disposing of ships' wastes and waste generated by port users**. LP, PP2, PP3, PP4, PP5, PP6, PP8 and PP9 will carry out SWOT analysis of their current port regulation and action plan on waste management**; PP6 is responsible for the organization of a round table, so that results of previously performed analysis are discussed and shared to transfer collected knowledge on waste planning and management in ports and foster environmental status.

The deliverable *T1.4.1 – SWOT Analysis of available port regulations* **aims to point out Strengths, Weaknesses, Opportunities and Threats of port regulations and action plans for waste management** that are necessary to develop innovative results in the management of waste in ports and their surrounding areas. **Technical supervising and the collection of all data prompted by surveys and site inspections** will produce an overview of the situation: it will be evident how far the ports situation is in line with the current action plan for waste management.

This report, consists of the following main sections:

- Presentation of the current port regulations,
- Presentation of the current action plan on waste management,
- Key Actors,
- SWOT Analysis,
- Suggestions/ Conclusions,

while a brief overview of the examined facilities/ areas is hereby presented, per project partner, to facilitate information flow.

1.1 Italy – Port Network Authority of the Ionian Sea (Port of Taranto)

The Port facilities aimed at collection available in the port of Taranto are mainly made up of some nautical means, collecting waste directly aboard, and of two fixed ecological areas, where used oils, filters and exhausted lead batteries are collected.

The Taranto Port is equipped with different collection system functional to waste type.

For waste treatment there are two plants, one for the treatment with autoclaving for the sterilization treatment of residues and food waste produced by ships/vessels from extra EU countries, and one (outside but near the port) for bilge water management.

VARIOUS WASTE

The port reception system/facility currently consists of:

- n. 3 motorboats for inland navigation, equipped with caissons/bins for the separate collection of solid and/or liquid waste packed in bags or drums and various equipment for transshipment by sea;
- n. 1 barge with collection tank of 30 m3 capacity and equipped with transfer pump, hoses and various equipment for the transshipment of liquid waste in bulk by sea;
- n. 2 self-compactors for the collection by land from ships of special waste similar to unsorted municipal waste and transport to a landfill plant;
- n. 2 vehicles equipped with simple rammer for the collection by land of unsorted municipal solid waste from ships and transport to a landfill plant;
- n. 1 tarpaulin vehicle suitable for ADR regulations for the collection of hazardous waste from ships by land and transport to authorized disposal/recovery plants;
- n. 1 vacuum truck equipped with specific authorization for draining cesspools and transport with a tank with a maximum capacity of 10 m3;
- an autoclaving system for the sterilization treatment of residues and food waste produced by ships from extra EU countries, in compliance with the orders of the Ministry of Health of 21st April 1999 and 10th May 1973.

AUTOCLAVING PLANT

It should be noted the presence, in the port area, of an autoclaving plant for the sterilization treatment of residues and food waste produced by ships from non-EU countries, owned by the company Nigromare S.r.l..

The aforementioned plant was built in an area, identified and equipped for this purpose within the port area of Taranto where the sterilization of food waste is carried out before their final disposal.

The plant consists of a metal structure shed with dimensions of 10 m x 16 m and h=5 m, the creation of internal partitions in bearing masonry of 30 cm bricks, to operate the necessary compartments. The factory has a gross area of 160 m2 and is surrounded by a large paved and fenced area. Inside, in addition to the work area and the related plant, three areas have been created, respectively intended for services (bathrooms and changing rooms), for the auxiliary steam treatment equipment to the autoclaving chamber and for the temporary storage of treated waste.

The plant is equipped with adequate technologies and is built and implemented with suitable operating procedures to prevent risks for the population and environmental pollution. It is a system with technology developed for an effective bacterial neutralization of residues and food waste, generated on ships from non-EU countries, and is also equipped with all systems to prevent any risk of emission and diffusion in the environment of dangerous substances polluting and infectious.

The autoclaving plant (pump) consists of a prefabricated modular structure in stainless steel, with overall dimensions of 3x2,1 m and a height from the ground of 3 m. The module is divided

into two areas respectively used for:

- horizontal sterilization chamber (autoclave), with floor loading, with a useful volume of 3.5 m^3;
- rooms equipped for housing machines, service equipment and instrumentation for the operation and control of the plant.

The described plant is ISO 14001 certified and is in possession of EMAS registration.

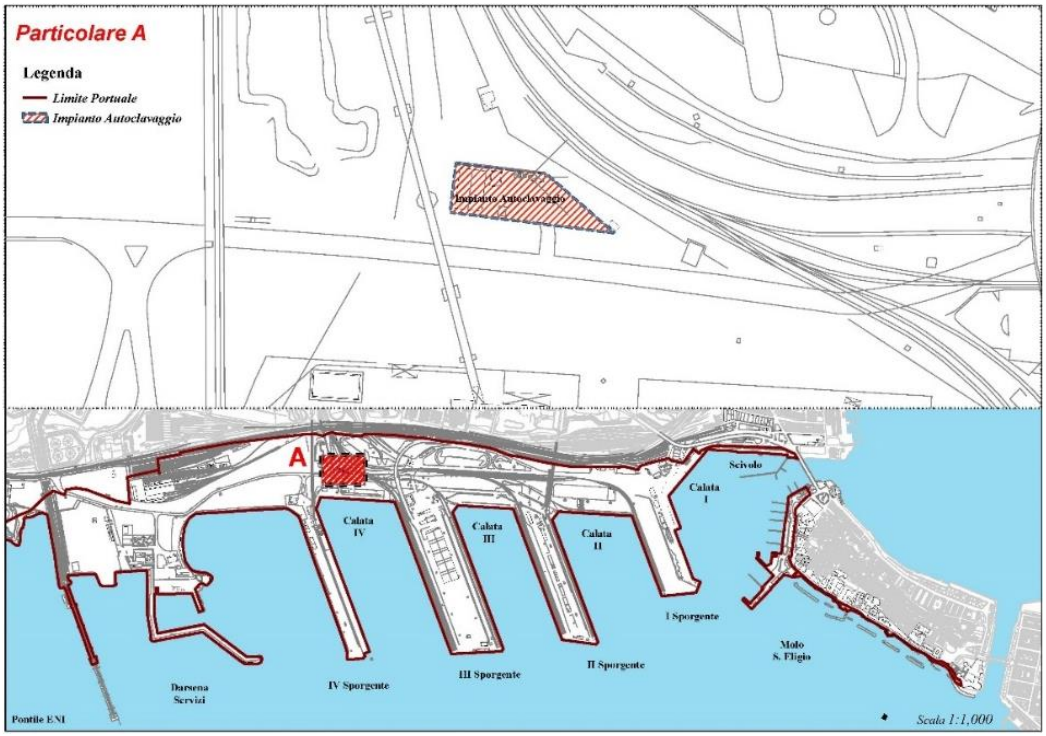

Figure 1 - Location of autoclaving plant

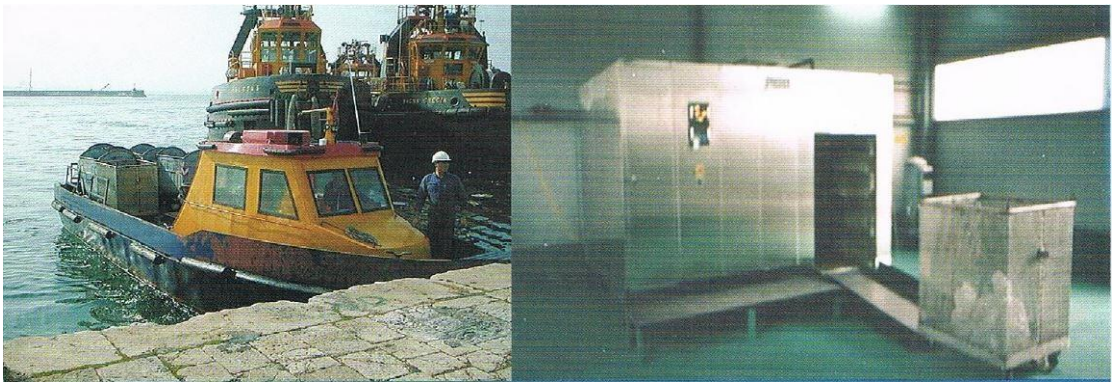

Figure 2 - Detail of waste collection and autoclave plant

SLOP (WASHING WATERS)

The systems and collection means for bilge water management, existing in the port of Taranto, are as follows:

a. n. 2 barges equipped for the collection by sea of liquid waste with a storage capacity of at least 120 m3 and equipped with its own suction system, consisting of a pump with a flow rate of at least 40 m3/h and flexible pipes suitable for high temperatures and pressures;

b. n. 1 ADR tank for the transfer of waste from the landing to the storage/recovery plant;

c. plant/plants for the recovery or disposal of liquid and muddy waste usually collected in the port of Taranto in the period of interest which are reported:

   - 130403* bilge oils;
   - 130502* General muds by the separation process between water and oil;
   - 160708* Oil content waste.

It should be noted that the plant used is not located within the port area; currently, the treatment plant of the Hidrochemical Service S.r.l. is used, located less than a kilometer from the Port of Taranto.

Figure 3 - Liquid waste recovery and disposal plant

With reference to the washing waters (slop), it was deemed necessary to identify a dedicated area in the port where the barges can unload the waste in fixed or mobile storage tanks for subsequent transport to the final destination. For this purpose, the Port Authority of the Ionian Sea is currently analyzing the available sites, among which, in particular, the suitability of the area located behind the IV dock to be equipped for the aforementioned activities is being assessed.

CLEANING WASTE PRODUCED IN COMMON AREAS

As for the cleaning waste produced in the common areas, the waste is collected in the appropriate differentiated bins as follows:

- n. 50 road bins with a capacity of 1100 l for unsorted waste;
- n. 25 bells / bins for paper – carton collection with a capacity of 1100 l;
- n. 10 bells / bins for glass collection with a capacity of 1100 l;
- n. 15 bells / bins for plastic collection with a capacity of 1100 l;

- n. 10 bells / bins for the metal collection with a capacity of 1100 l;
- n. 10 bells / bins for the metal/can collection with a capacity of 240 l;
- n. 10 bells / bins for glass collection with a capacity of 240 l.

We will proceed to implement the bins present with n. 1 bin for the collection of wet waste.

It is absolutely forbidden to create temporary deposits of garbage and other clearing materials coming from sweeping operations. The foregoing in order to ensure a separate collection service such as to maximize the quantity and quality of the collected waste so that, in compliance with the regulations in force, it can be recovered.

Currently, the waste collected in the common areas is managed by the company Teorema S.p.A..

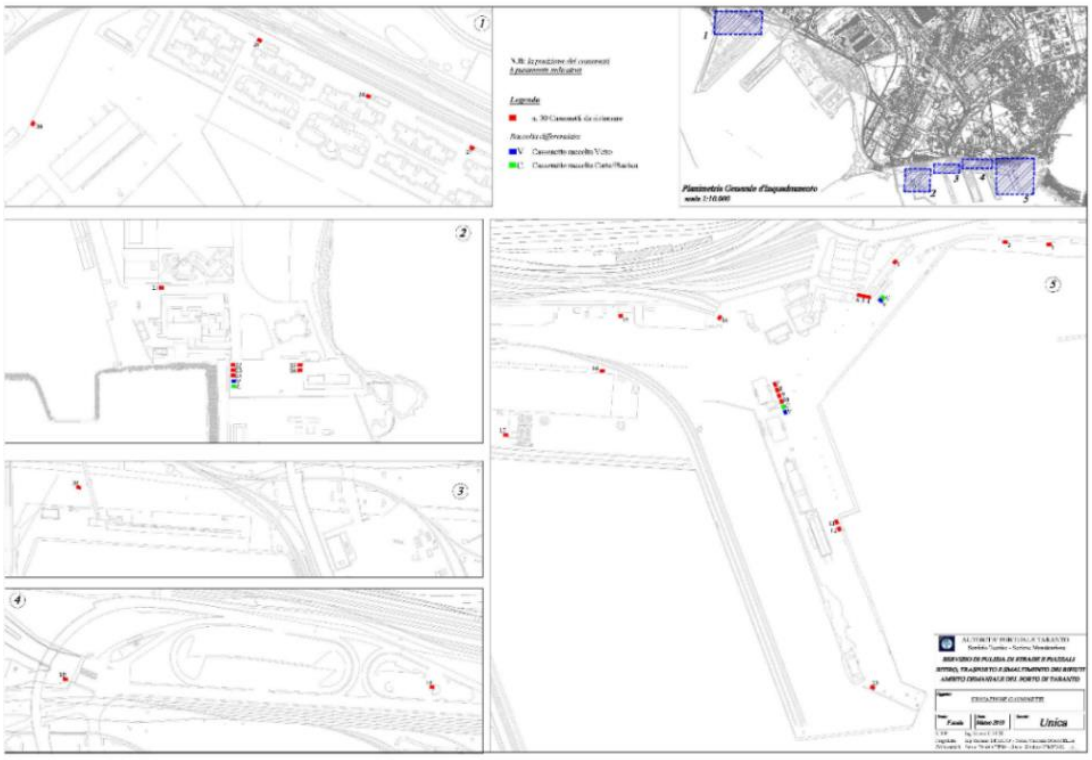

Figure 4 - Location of separate collection bins

PORT RECEPTION FACILITIES

As for the port reception facilities, the structure consists of a hexagonal metal cage, inside which the equipment and the appropriate containers are placed. In the port of Taranto, the collection service of used oils, unloaded from smaller units, from fishing and pleasure boats, filters and exhausted lead batteries is carried out by the Ecologica Sud company of Vito D'Angiulli.

Each facility consists of a hexagonal gazebo which houses three containers for the collection of used oil, oil filters and exhausted batteries respectively. The gazebo, green in color to mitigate its visual impact and better fit it into the surrounding landscape, is made of galvanized steel. The cover avoids the contamination of the collected waste with atmospheric agents. Furthermore, the base is made up of a grating placed on a steel base which acts as a

containment basin in the event of accidental oil spills.

The structures of the port reception facilities guarantee, also based on the provisions of the environmental management system of the Authority:

- adequate resistance requirements in relation to the chemical - physical properties of the waste;
- closing system, accessories and devices suitable for carrying out filling, pouring and emptying operations in closed conditions;
- maintenance in perfect efficiency of the machines and pipe fittings used for loading and unloading the liquid waste contained in the tanks in order to avoid dispersion into the environment;
- a safe residual volume equal to 10% of the fixed or mobile container or tank, equipped with an anti-overflow device or overflow pipes and level indicators and alarms;
- the same must be placed on a paved surface, the tanks must be equipped with containment of a capacity equal to the tank itself, equipped with an adequate emptying system;
- watertight containers, equipped with suitable collection systems for liquids, for waste that can give rise to leakage of liquids;
- grouping of the containers by homogeneous types of waste, arranged in such a way as to allow easy inspection (manhole), the verification of any leaks and the rapid removal of any damaged containers.

The environmental management system also provides that:

- Waste must be collected by homogeneous categories in specific areas of the plant, in compliance with the relevant technical standards and, for hazardous waste, in compliance with the technical standards governing the storage of hazardous substances contained therein.
- The deposited waste must not contain PCBs and similar in quantities exceeding 25 ppm [mg/kg] (NB: if you produce oils containing PCBs in concentrations above 25 ppm and you intend to deposit them, a specific regional/provincial authorization is required).
- Waste must be collected in such a way as to avoid the danger of dispersion, spreading and percolation on or into the soil.
- All places dedicated to the storage of hazardous waste must be equipped with signs indicating the type and possible danger.
- Liquid waste must be collected in suitable watertight containers (tubs, drums, cisterns, etc.), placed on paved, covered areas and preferably equipped with a containment curb.
- Drums and tanks containing waste must not be stacked for more than 3 floors and their storage must be ordered, providing for appropriate inspection corridors.

- Any hazardous waste produced must be collected separately, in sealed containers positioned indoors and on a paved area.
- The quantities in deposit must be removed with the frequency specified below:
  - non-hazardous waste, at least quarterly or when it reaches a total of 20 m^3;
  - hazardous waste, at least quarterly or upon reaching a total of 10 m3;
  - or at least once a year if the total annual waste production does not exceed 20 m3 for non-hazardous waste and 10 m3 for hazardous waste.
- Tanks containing liquid waste:
  - they must bear an identification code;
  - they must have systems for capturing any vents, which must be sent to specific abatement systems;
  - they can contain a maximum quantity equal to 90% of the tank capacity;
  - they must be equipped with level indicators;
  - if equipped with overflow pipes, the drain must be conveyed to a special containment basin.

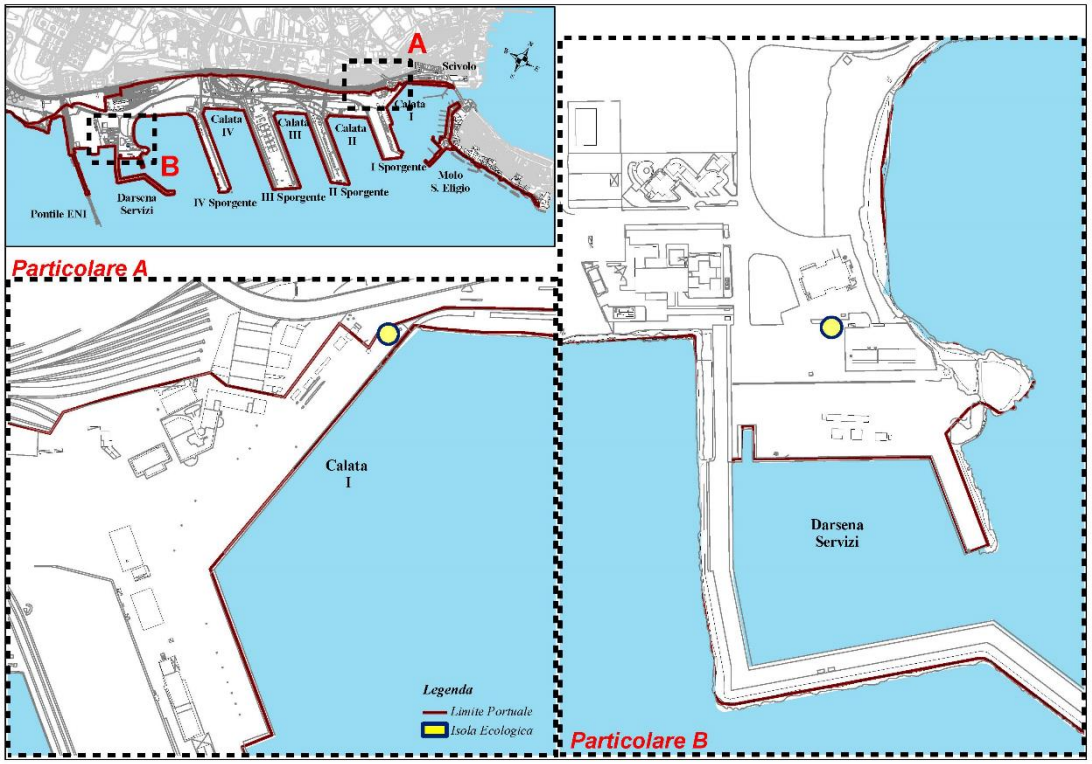

Figure 5 - Location of port reception facilities in the Port of Taranto

Figure 6 - Port reception facilities within the port area of Taranto

This paper gives a brief description of the documents governing the activities and services carried out within the port area, in particular:

- **"Regulation for the performance of port operations and services in the port of Taranto"** which defines the type of port operations and services, the maximum number of authorizations established for the reference year and the procedures for the presentation and issue of authorizations.
- **"Waste collection and management plan of the Port of Taranto"** which regulates the management of all the different types of waste produced in the port area, not only with reference to waste produced by ships but also to waste that is produced and managed throughout the territorial district of competence. The most recent update of this Plan was approved with D.G.R. of the Puglia Region n. 1203 of July 31, 2020.
- **The "Regulation for the regulation of the waste collection service from ships in the port of Taranto"** approved by order no. 12/2020 of 05/06/2020 by the Port System Authority of the Ionian Sea and which applies to all ships arriving in the port of Taranto, at anchor or at anchor, which must deliver waste. Military warships and auxiliary ships or other ships owned or operated by the State, if used for non-commercial government services, are excluded from the scope of this Regulation.
- **The "Ordinance on ecological islands"** adopted with ordinance no. 08/2009 by the Port System Authority of the Ionian Sea and establishes the methods of management and collection services for waste oils, filters and spent lead batteries, produced by smaller units, fishing and pleasure boats.

Chapter 4 of this document contains the main key actors and competent authorities involved

in port waste management and a brief description of each, indicating the relevant activities carried out.

Chapter 5 is of significant interest, which examines, through the SWOT analysis tool, the programming tools used by the Ionian Sea Port System Authority with regards to waste management in the port area, identifying its strengths and weaknesses, opportunities and threats.

Means used for SWOT analysis are:

- ✓ Analysis of the technical documentation relating to the plants (present and programmed);
- ✓ Interviews with service dealers;
- ✓ Meetings with the Operational and Security Directorate of the Security, Surveillance and Control Section of the Ionian Sea Port System Authority;

1.2 Italy – Central Adriatic Port Authority (Port of Ancona)

The port facilities in the port of Ancona aimed at collecting waste are mainly made upof some nautical and various land vehicles, which respectively collect the wastedirectly on ships and on land, and two fixed ecological areas, where the oils are collected. used, spent filters and lead-acid batteries and other recoverable waste (paper, plastic and glass).

For the treatment of waste within the boundaries of the port of Ancona there is an autoclaving system for the sterilization treatment of residues and food waste produced by ships/boats from non-EU countries. The remaining types of waste are managed in plants outside the port perimeter.

With regard to these aspects, it should be noted that the Central Adriatic Ports Authority has foreseen, in the drafting of the Port System Regulatory Plan, thepresence of spaces in the port area to be dedicated to the installation of systems for the treatment of water ballast and bilge water, which today are managed, if the need arises, in extra-port areas.

Currently the plan provides for a site, in concession to the current concessionaire, in the South Pier area, in which a suitable area is identified for the temporary storage (Article 4 paragraph 4 of Legislative Decree 182/2003) of waste delivered by ships, awaiting subsequent transport for recovery/disposal. The area in question also hostsa sterilization plant authorized by the Province of Ancona (authorization no. 47/2018 of 2/08/2018 category D9 "Plant for the sterilization of waste consisting of food scraps, used for the supply of crew and passengers of naval means of transport from non-EU countries "with a maximum negotiable quantity of 9 tons / day (authorizationexpiry 13/10/2028).

Figure 7 - South pier area. Area under concession for the temporary storage of waste delivered by ships

The plant consists of a shed with a metal structure of adequate size. The factory is surrounded by a large paved and fenced area. Inside, in addition to the work areaand the related system, the office and service areas (bathrooms and changing rooms)have been created.

The plant is equipped with adequate technologies and is built and implemented with suitable operating procedures to prevent risks for the population and environmental pollution. It is a system with technology developed for effective bacterial neutralization of residues and food waste, generated on ships from non-EU countries,and is also equipped with all systems designed to prevent any risk of emission and diffusion into the environment of dangerous substances. polluting and infectious.

The autoclaving system consists of a prefabricated modular structure in stainlesssteel. The module is also equipped with a sterilization chamber (autoclave), with floor loading as well as the necessary instrumentation for the operation and control of the system, as shown in the following figure.

Figure 8 - Sterilization plant

In the aforementioned South Pier area, identified by the Central Adriatic Ports Authority, there is also an area intended for the temporary parking of the roll-off containers used for the collection of waste and for the parking and handling of vehicles used for the collection and transport of said waste.

Figure 9 - Temporary parking area for containers for recoverable waste

The concessionaire also has two other areas for the separate collection of hazardous and non-hazardous waste from the port of Ancona, authorized pursuant to art. 208 ofLegislative Decree 152/2006.

In detail, the following are identified:

- N.1 fenced and manned port reception facilities located in the “ex Morini slipway” area authorized by the Province of Ancona with Authorization n. 16/2018 of 10/04/2018 intended for the reserve (R13) and preliminary storage(D15) of hazardous and non-hazardous waste with a maximum storage capacity of 25 tons (authorization expires 10/4/2028).
- N.1 port reception facilities “ex Tubimar area” authorized as reserve center (R13) with provincial authorization n. 17/2010 of 14/10/2010 and intended forthe storage of special non-hazardous waste from ships and production activities in the port of Ancona, with a maximum storage capacity of 130 tons (authorization expires 10/3/2030).

The concessionaire also has a concession for the mooring of nautical vehicles usedfor the collection of waste from ships parked in the Port of Ancona and/or roadstead, and/or oil terminals.

Figure 10 - Mooring area for nautical means of collecting waste from parked ships

Below is the plan of the Port of Ancona with an indication of the location of the facilities described above.

Figure 11 - Location of waste management facilities in the Port of Ancona

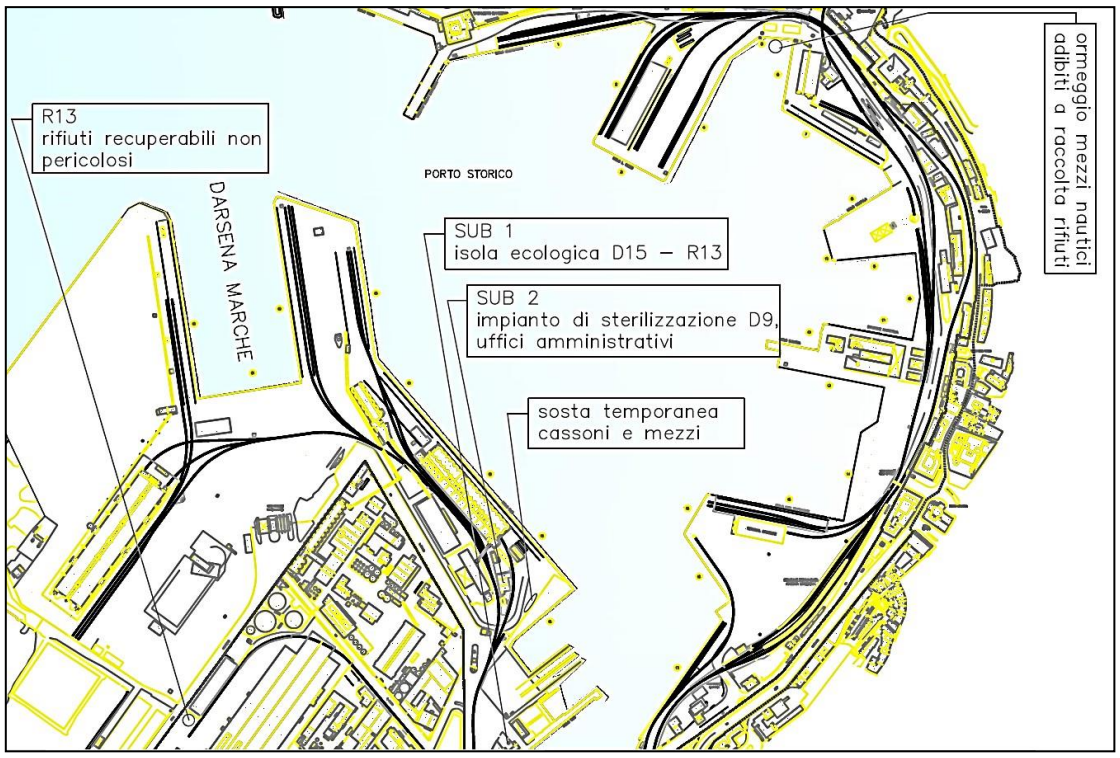

Figure 12 - Location of waste management facilities in the Port of Ancona. Detail.

The qualitative-quantitative analysis of the last four years by tonnage and typerelated to the quantity and type of waste and cargo residues withdrawn from the ships, have allowed the AdSP MAC to verify that the current port reception facilities allow an effective service and efficient in relation to the production of waste produced.

For the collection of waste produced in the port area, the ATI concessionary of the service makes use of land and water vehicles. Among the latter, the dealer uses the nautical means called PELIKAN "2" used for:

- Removal of the floating and semi-submerged macro pollution through ascreening system placed in the bow of the vessel;
- The recovery of floating liquid waste (for example oils) through the suction of water inside a hydrocarbon separator for the complete separation of the polluting film from the sucked water mass;
- Support for fire rescue through the seawater circulation system and the cannon mounted in the aft area of the vehicle;
- The spraying of chemical dispersants authorized by the Ministry of the Environment. For this purpose, the vehicle is equipped with a double system, one on the right side and one on the left side of the vehicle.

Photovoltaic panels (for a maximum total power of 800 W) are also installed on the roof of the PELIKAN "2" to recharge the batteries with the engine off and, in operation, to power the auxiliary electrical services and the air conditioning of thecabin.

Figure 13 - Nautical vessel Pelikan "2"

Figure 14 - Nautical vessel Pelikan "2". Details.

The vehicle is also equipped with:

- n. 2 rollers of 100m each, one of “light” floating booms made of PVC/Nitrile, covered in woven polyester, with a highly visible red color, resistant to oilsand sunlight, easy to position, light and simple to handle;

Figure 15 - “light” floating booms

- 1 floating unit "Minimax 10 skimmer" consisting of 6 disk brushes each of which, rotating in the direction of the water, forces the oil below the sea level and then inside the brush. The unit has a recovery capacity of 10 tons / hour;

Figure 16 - Minimax 10 skimmer

- n. 1 “Rock Cleaner” unit, designed for the cleaning and recovery of oilsdeposited at docks, cliffs, ports, terminals, boat ports, where large units have difficulty operating. It makes it possible to collect oil from water in confined spaces (between rocks, from concrete, from asphalt). It can also be used for cleaning chemical product spills;

Figure 17 - “Rock Cleaner” unit

- "Oil-Only Wipes" system consisting of an absorbent wipe that floats on water. The aforementioned wipe has been formulated to control and clean any leaks of hydrocarbons and derivatives, poured into fresh and salt water and is composed of a modified mixture of water-repellent polypropylene with an absorption capacity of 1.36 liters.

Figure 18 - “Oil-Only Wipes” system

- “Oil-Only Booms” system made up of absorbent cylinders for immediateemergency. Easy to assemble as they are equipped with carabiners, theycreate a barrier that prevents the spread of the hydrocarbon stain.

Figure 19 - “Oil-Only Booms” system

1.3 Greece – Igoumenitsa Port Authority

The port of Igoumenitsa consists of the Old Port, the Inland Port (Corfu Ferry) and the New Port. The Old Port is the natural port in Igoumenitsa bay where F / G ships and tugs arrive. The Car Passenger Ferries arrive at the Inland Port, which run itineraries to and from Corfu, Lefkimmi and Paxos. The New Port of Igoumenitsa, is used by ships which operate mainly international routes (to and from Italy), domestic ships, as well as cruise ships. The New Port has a total number of 12 docks, while the total length of the platforms is 781 m (at each jetty) and the docks' depth is 10.5 m. Also, it can simultaneously service on up to 7 ships. Following the completion of the 2nd Phase of the construction project of the New Port, a Cruise Terminal has been additionally constructed which will host the Cruise Ships that will approach the port of Igoumenitsa. Within the area of the New Port the Passenger Terminal Building, the new offices of O.L.IG. SA, the port body, and the Customs are housed. Within the New Port there are also the following services:

- Facilities for receiving waste and ship residues;
- Water supply and electricity of ships;
- Fire station;
- Sanitary and veterinary station.

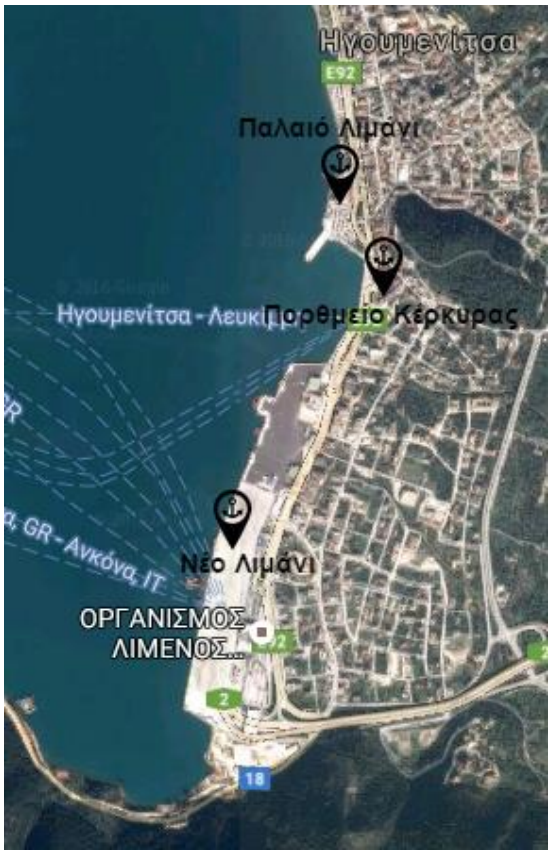

Figure 20 - Port of Igoumenitsa

The present report is focused on the **elaboration of a SWOT analysis to point out which are the Strengths, Weaknesses, Opportunities and Threats identified** with regards to the **Port Regulations and Action Plan for Waste Management in the Port of Igoumenitsa**, following the findings of reports already implemented under the WP T1, and the findings from the means used for the elaboration of this report.

In this framework, a series of actions have taken place aiming to lead to the present SWOT Analysis, that include **Desk Research, Technical Reports, Input by Igoumenitsa Port Authority documents, personnel and experts, and prior T1 works findings.**

The SWOT tool is being analyzed in detail in chapter 5 and could be exploited by the competent authorities to suggest specific measures, co-operate, and implement strategies towards the improvement of documents and of Igoumenitsa port overall.

1.4 Croatia – Zadar County Rural Development Agency (Port of Zadar)

Port of Zadar Authority is founded by the Ordinance of the Croatian Government in 1998 with jurisdiction on three port docks:

1. ***Passenger City Port Zadar*** is situated in the heart of the city and has 11 berths with maximum depth of 7,4 meters with the purpose of local and tourist traffic. It is used for passenger ships on international and domestic lines, smaller tourist vessels and fishing vessels.
2. ***New Port of Gazenica, Zadar***
    - *New passenger, cruise, ferry and Ro-Ro terminals in Gazenica.* The new port has 12 berths for domestic and international traffic (ferries connecting Zadar with the islands, international vessels and cruise ships).
    - *New Fishing Port Gazenica* which currently consists of one shore that stretches in the direction northwest - southeast in the length of 210 m. It is currently used to accommodate fishing boats and to load and unload fish and fishing equipment.
    - *Commercial Cargo Port in Gazenica* is in the industrial and commercial area extending from Bregdetti Bay - Arbanasi to the small town of Bibinje in the vicinity of the passenger port. It is used for domestic and international cargo ships but can also be used for fishing vessels
3. ***Fishing Port Vela Lamjana-Kali*** which is situated in the Vela Lamjana Bay on the island of Ugljan. It is used for loading and unloading of fishing boats.

Subject to the pilot activity of the project ECOWAVES is the New Port of Gazenica as a modern port partially opened in 2015 for all traffic with a temporary terminal building in order to disburden, relocate and provide additional capacities for ferry and cruise ships 3,5 km south from the city centre.

The image below shows the location of the New Port of Gazenica in relation to the city centre.

Figure 21 - Location of the New Port of Gazenica

Purpose of berths in Gazenica under the jurisdiction of the Port of Zadar Authority is:

- Berths, 1, 2, 3, 4, 5, 6 and 7 are used for passenger ships on regular domestic lines.
- Berths 8, 9, 10, 11, 12 are used for passenger ships in on international lines, where berths 8 and 9 are used for liner international shipping.
- Loading and unloading of fishing boats located on the northern part of the port area (length 210m)
- Gas station – passenger port Gazenica for refueling of vehicles and vessels.

Location of listed berths is indicated in the Image below.

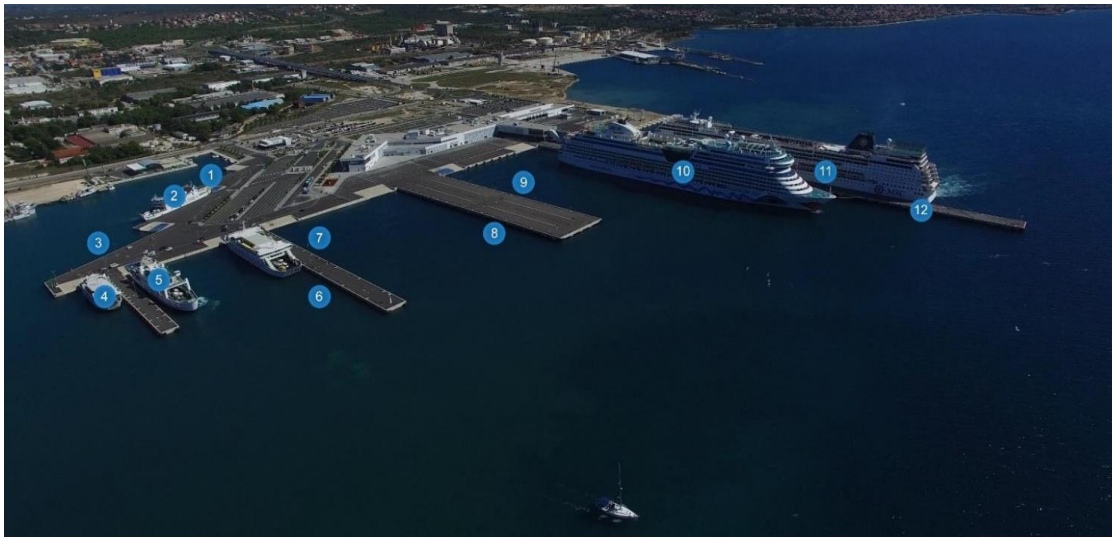

Figure 22 - Berths in the New Port of Gazenica
Source: Port of Zadar Authority

In 2019, Zadar was ranked as a third cruising destination in the Republic of Croatia after Dubrovnik and Split and it was chosen as the world's best port at the Seatrade Cruise Awards 2019 with a tendency to increase the traffic in the following years prior to the breakout of the COVID-19 pandemic. Nevertheless, since the pandemic struck the entire cruising industry,

projections are that Zadar will continue to grow as a cruising destination when the health situation allows and conditions for the international travels are met and fulfilled.

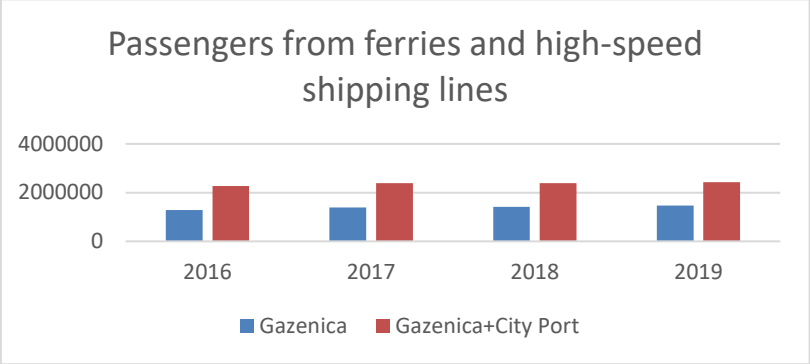

Figure 23 - Passengers in the New Port of Gazenica in comparison to the total number of passengers (excluding cruisers)
Source: Port of Zadar Authority

It can be concluded that the total number of passengers is in constant increase since 2016. In 2019, 64% of all passenger traffic from ferries and high-speed ships (excluding cruisers) goes to the New Port of Gazenica together with 100% of all vehicle traffic (Table below) which highlights the significance of the New Port of Gazenica in terms of passenger and RO-RO traffic.

Table 1 - Total number of vehicles in the New Port of Gazenica from 2016 to 2019

New Port Gazenica	Vehicles
2016	403.114
2017	437.437
2018	465.335
2019	491.953

Source: Author based on the Port of Zadar Authority data

Total number of calls in Passenger Port of Gazenica (Ferry and Cruise) is between 7.400 and 7.600 calls, depending on year.

Figure 24 - Ferry

Waste collection in the area managed by the Zadar Port Authority is handled by specialized companies that have received a concession from the Port Authority to perform this activity.

Concessionaires have different types of environmental protection equipment and means of transport for waste collection. Waste can be collected by land by specialized trucks and tank trucks of various capacities and purposes.

Figure 25 - Waste Collection Truck

In the area of the Port Authority it is possible to dispose of various quantities and types of waste from ships such as: municipal waste, various types of oily bilge water, motor oils, oily adsorbents, emulsions, waste paints and varnishes, as well as various types of other hazardous waste.

Waste from ships in the area of the Zadar Port Authority must be treated in such a way that avoid:

a. danger to human health;
b. danger to flora and fauna;
c. pollution of water, sea, soil and air above the prescribed limit values;
d. uncontrolled disposal and incineration;
e. explosion or fire;
f. noise and unpleasant odours;
g. emergence and reproduction of harmful animal and plant organisms, and development of pathogenic microorganisms;
h. disturbance of public order and peace.

Figure 26 – Waste collection

The objectives of ship waste management are:

- selective collection and separation of waste for secondary recovery;
- controlled waste disposal;
- prevention of irresponsible waste management;
- education on waste management;
- avoiding unnecessary delays for the ship when picking up waste.

1.5 Slovenia - RDA North Primorska d.o.o. (Port of Koper)

The basic infrastructure in the Port of Koper (Slovenia), further analyzed in the T1.2.2 Report, are hereby summarized.

The pivotal infrastructure in waste treatment in the Port of Koper is the Waste Management Center, which was built in 1997. Its location is shown in the Image below.

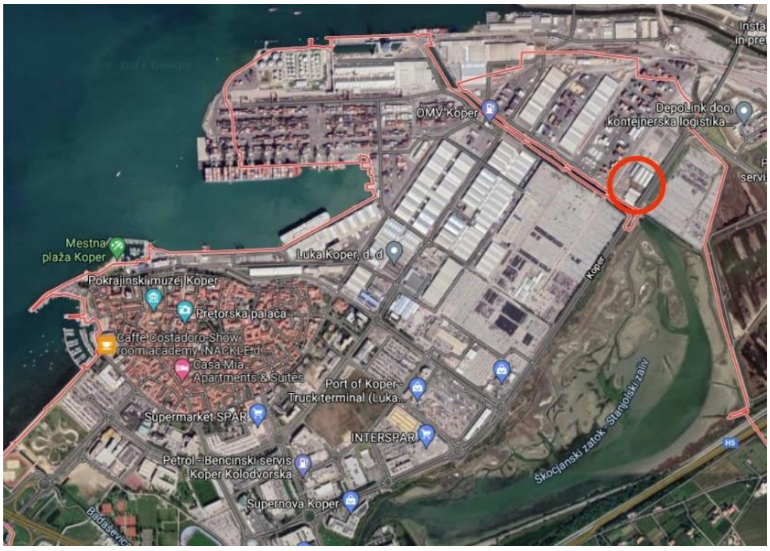

Figure 27 - Aerial photo of Port of Koper with the location of the Waste Management Center (red circle).

Fire protection modernization has begun in the center, which covers an area of 12,700 m^2, and construction will be completed in 2021.

The Center also includes an organic waste processing composting facility (Image 14), which is used to produce compost. Of the three categories of compost, the Port of Koper produced the highest quality compost and the second best. In 2020, there was no waste for processing by Luka Koper d. d. However, in 2021, due to the lack of customers who could use it, the composting plant will be closed, and the authorized company will be assigned to process organic waste.

Figure 28 - The organic waste halls in the Waste Management Center of the Port of Koper.

The Waste Management Center has a facility for the pre-storage of hazardous wastes (**Errore. L'origine riferimento non è stata trovata.** 15), e.g. paint residues, varnishes, old medicines from ships, batteries, oiled cloths, ship's ash, absorbents, etc., generated in the port area or taken over from ships. They are handed over to authorized organizations.

Figure 29 - The pre-storage of hazardous waste in the Port of Koper (courtesy from Anon.(2021).

The subsidiary Luka Koper INPO collects *marine oils at the bilge facility* and releases them to authorised organisations. The facility is in the process of obtaining a construction permit to increase its collection capacity.

As part of the bilge, there is also an *incinerator* listed on Environmental Permit Amendment No. 35440-50/2019-10 dated October 21, 2020. Measurements were taken on the incinerator that heats reservoirs where marine oils are stored.

Luka Koper d. d. also stores *the scrap metal, plastic waste and rolling mills* and has an environmental permit for transhipment or temporary storage of scrap metal, plastic waste (**Errore. L'origine riferimento non è stata trovata.** 16) and rolling mills. For the company, goods or waste represent cargo like any other that passes through the port, with the company acting only as one of the links in the transport and logistics chain. The metal scrap handled is classified as non-hazardous waste. The handling of ferrous scrap resumed in 2020, but not that of other waste.

Figure 30 - Storage of lumber from pallets (a), scrap metal (b), plastic (c) and (d), the latter storing plastic straps from freight containers, and mattresses from ships it the port of Koper.

The Port of Koper also occasionally handles cattle and the slurry is treated in accordance with EU Decision 2014/955 (EGW 02 01 06: Animal faeces, urine and manure (including spoiled straw), waste water, collected separately and treated off-site) (**Errore. L'origine riferimento non è stata trovata.**).

Figure 31 - The storage halls for manure in the Waste Management Center of the Port of Koper.

The Port of Koper operates with ten cisterns; eight of them have a volume of 20 m^3 and together have a capacity of 186 m^3 for temporary storage of liquid sludge. All of them are located in the tank park area called "kalužnica", which is located at the seaward end of Pier 1 of the port. The liquid sludge is transported from the ship by a special cistern truck owned by

the subsidiary INPO. When the capacity of the "kalužnica" is almost full, the liquid sludge is transported away from the port area by cistern trucks (to incinerators in Austria).

At present, the administrative building, the workwear storage building and two nearby buildings outside the port area, namely the ambulance building and the restaurant, are heated using the combustible waste. Monitoring of emissions of pollutants and greenhouse gasses is carried out regularly and strictly and is described in detail in Anon. (2021).

SITE INSPECTIONS, TECHNICAL REPORTS

The 2019 REMPEC report (REMPEC, 2019) describes the waste management plans in the Port of Koper, as one of six targeted pilot projects in accordance with the Cooperation Agreement between UNEP and IMELS (Italian Ministry of Environment, Land and Sea Protection) and the corresponding mandate - REMPEC leads efforts that contribute to the improvement of Marine Litter Management and specifically focus on the management of marine litter generated by ships.

On 22 May 2019, the REMPEC delegation visited Luka Koper. The purpose of the visit was to advise the Port on implementing better management of marine litter in ports and marinas to improve implementation of Marine Litter Regional Plan (written on page 3 of the 2019 REMPEC report). The consultancy visit was funded from the resources available under the Memorandum of Understanding between the United Nations Environment Program (UNEP) and the Italian Ministry for Environment, Land and Sea (IMELS).

In the report of the Port of Koper (Anon., 2021) we find three groups of waste produced in the port:

a. Ship waste left behind by ships moored in the port of Koper (e.g. sewage, oily water, kitchen waste, packaging waste, medicines, ashes, mixed municipal waste);

b. Waste from port activities (e.g. cargo residues, wood, packaging and metal waste, mixed municipal waste);

c. Other waste in the port area (waste generated by users of the economic zone).

During the operation of the port, different types of waste are collected separately, recycled and recovered or transferred to authorized organizations. Luka Koper provides the mandatory national non-profit service of solid and liquid waste collection from vessels in the port area. The activities related to this service are carried out in the Waste Management Center.

In the last report of Luka Koper (Anon., 2021), one can also find the table of inspections, which we will briefly reproduce here, in the Table below.

Table 2 - Inspections in the Port of Koper in the year 2020

Inspectorate	Start date, notification of the process	Subject matter	Findings
Inspectorate of the Republic of Slovenia for the	5 Feb 2020 (self-declaration)	Review of the adequacy of measures during the accident and the adequacy of measures	The inspection service examined the scene and requested a report on

Inspectorate	Start date, notification of the process	Subject matter	Findings
Environment and Spatial Planning		after the accident that occurred on 31 January 2020 in Basin III.	the management of the generated waste. The request was met by Luka Koper on 25 February 2020.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	26 Feb 2020 Supervision on the elimination of irregularities performed on 16 Jun 2020 and 24 Jun 2020.	Fire protection control in the general cargo profit centre. Minutes No 0611-620/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	27 Feb 2020 Supervision on the elimination of irregularities performed on 16 Jun 2020 and 24 Jun 2020.	Supervision on the elimination of irregularities in the field of fire protection in the general cargo profit centre at the reefer terminal. Minutes No 0611-622/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	28 Feb 2020 Supervision on the elimination of irregularities performed on 16 Jun 2020.	Fire safety monitoring in the general cargo profit centre at the livestock terminal. Minutes No 0611-621/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	28 Feb 2020 Supervision on the elimination of irregularities performed on 16 Jun 2020.	Fire safety monitoring in the general cargo profit centre at the timber terminal. Minutes No 0611-623/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	4 Mar 2020	Fire protection supervision in the car and RO-RO Terminal profit centre. Minutes No 0611-624/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	5 Mar 2020	Fire protection control in the Container terminal profit centre. Minutes No 0611-625/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	6 Mar 2020 Supervision on the elimination of irregularities performed on 15 Jun 2020.	Fire protection supervision in the Bulk and liquid cargo Terminal profit centre at the liquid cargo terminal. Minutes No 0611-626/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	11 Mar 2020	Fire protection supervision in the Bulk and liquid cargo Terminal profit centre at the bulk cargoes terminal. Minutes No 0611-630/2020-1 were issued	Irregularities were identified and eliminated within the deadline.

Inspectorate	Start date, notification of the process	Subject matter	Findings
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	13 Mar 2020	Fire protection supervision in the Bulk and liquid cargo Terminal profit centre. Minutes No 0611-632/2020-1 were issued	No irregularities were found.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	13 Mar 2020 15 Jun 2020 regarding the elimination of the recorded irregularities	Fire protection supervision in the Bulk and liquid cargo Terminal profit centre at the dry bulk terminal. Minutes No 0611-631/2020-1 were issued	Irregularities were identified and eliminated within the deadline.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	8 Jun 2020	Routine inspection of protection against natural and other disasters. Minutes No 0611-1154/2020-1	No violations were found.
Infrastructure Inspectorate of the Republic of Slovenia	9 Jul 2020 25 Sep 2020 regarding the elimination of the recorded irregularities	Supervision of personnel competence for the management of energy devices Minutes No. 06152-344/2020-4 were issued	Irregularities were identified and eliminated within the deadline.
Infrastructure Inspectorate of the Republic of Slovenia	9 Jul 2020	Supervision of personnel competence for the management of energy devices Minutes No. 06152-371/2020-1 were issued	No inconsistencies were found.
Chemicals Office of the Republic of Slovenia	8 Jul 2020	Inspection of the implementation of provisions of the Rules on technical and organisational measures for the storage of hazardous chemicals (Official Gazette of the Republic of Slovenia, No. 23/2018). Minutes No 06101-36/2020/1	No violations were found.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	16 Jun 2020	Fire safety monitoring in the general cargo profit centre at the livestock terminal, Minutes No 0611-634/2020-1	A warning was issued with the deadline for elimination on 16 Jun 2021
Inspectorate of the Republic of Slovenia for the Environment and Spatial Planning	6 Jul 2020	Inspection of a facility with a high risk of accidents - Seveso Minutes No 06182-867/2020-2	The inspection did not reveal any irregularities or other violations of regulations.
Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters	22 Sep 2020 15 Oct 2020 and 30 Dec 2020 regarding the elimination of the recorded irregularities	Supervision of duty holder Luka Koper INPO d. o. o., execution of fire protection measures, namely authorisation for implementation of fire protection measures, fire risk assessment, fire order, evacuation plan, fire plan,	Inconsistencies were identified, on the basis of which the Inspector issued a decision with the deadline of 14 Sep 2021 and 14 Sep 2022.

Inspectorate	Start date, notification of the process	Subject matter	Findings
		training. Minutes No 0611-2068/2020-2 were issued	
Inspectorate of the Republic of Slovenia for the Environment and Spatial Planning	16 Jul 2020	Supervision of compliance with the provisions for transhipment of metal waste in accordance with the issued environmental permit No. 35444-2/2016-3. Minutes No 06182-140/2020-5	No irregularities were reported.
Inspectorate of the Republic of Slovenia for the Environment and Spatial Planning	4 Nov 2020 (self-declaration)	Notification to the Environmental Inspector about the waste found during soil consolidation for the construction of a new entrance to the port, the external truck terminal at the entrance…	Based on the assessment of the found waste, it was determined as non-hazardous waste. The tires and waste foil were properly handed over to authorised collectors, and the excavated soil was used at the construction site.
Infrastructure Inspectorate of the Republic of Slovenia	26 Nov 2020	Supervision of pressure vessels owned by Istrabenz plini d. o. o. located in the port, located at Luka Koper car service, at the liquid cargo terminal, at the dry bulk terminal, located at the Vehicle processing hall. Minutes No 06152-605/2020-3, No 06152-606/2020-2, No 06152-602/2020-3, No 06152-603/2020-2, No 06152-604/2020-2 were issued, respectively.	A warning was issued to Istrabenz plini d. o. o. with the deadline for elimination on 31 Dec 2020.

1.6 Serbia - Eco Zone Ada Huja

Due to Covid-19 pandemic situation, visiting all ports and interviewing the representatives and employees was not possible. The Partner visited Port of Belgrade and obtained information in unofficial conversation about progress in waste management after the adoption of the Waste Management Plan in 2018, as well about current practices.

The port authority (Port Government Agency) has submitted Waste Management Plan drafted in 2018, which consists of all chapters prescribed by Law on Waste Management, as well as other useful information (presentation and internal reports). In addition, Feasibility study for the construction of a terminal for waste materials from vessels in the area of Belgrade from 2016, obtained from City of Belgrade representatives was used in this Report.

In the following images, the location of Port of Belgrade, as well as photos taken during visit are presented.

Figure 32 - Location of Port of Belgrade

Figure 33 - Photos taken during visting Port of Belgrade (1)

Figure 34 - Photos taken during visting Port of Belgrade (2)

Figure 35 - Photos taken during visting Port of Belgrade (3)

Access to the part of the port where cargo is being unloaded was not allowed for security reasons. Below are photos obtained from the Port Government Agency.

Figure 36 - Photos from the Port Government Agency (1)

Figure 37 - Photos from the Port Government Agency (2)

1.7 Albania – Port of Vlora

Marine litter comes from multiple sources. Among them, the main sea-based sources of marine litter are fishery and shipping activities causing a wide range of ecological, environmental and socio-economic impacts. In order to address the problem of ship-generated marine litter, there is a strong need for the introduction of marine litter management policies and systems that should cover issues from marine litter management onboard and reception of litter via reception facilities in ports and marinas to its final treatment. The main legal basis for the ship-generated marine litter is the International Convention for the Prevention of Pollution from Ships (MARPOL Convention), particularly its Annex V.

A present major problem for ports is arranging adequate reception facilities for ship-generated waste, as the lack of such facilities is a problem to many ship-owners. To preserve the environment in and around the ports it is necessary also to deal efficiently with the port-generated waste. Although international conventions on the retention of waste on board ships for subsequent discharge to shore reception facilities have been ratified by most seafaring nations, a considerable part of the ship-generated waste still goes into the sea. Much of the waste generated in ports will also be dumped in quantities that at least affect the local marine environment. The regulations governing the handling of port-generated waste are often national and/or local legislation, whereas the handling of ship-generated waste is governed by the MARPOL Convention in most parts of the world, including Albania that is part of this Convention.

The handling of waste consists of two main phases: collection and treatment. Waste has to be collected in every port and on board every ship, whereas generally only some wastes are treated and to a certain degree in ports and on-board ships.

This study considers the different kinds of waste generated by the ships, where and how it is generated, how it could be managed and treated in accidental cases. The different kinds of wastes are treated together to show how some ship-generated waste may be treated in port installations primarily constructed for the treatment of the port-generated waste, making integrated use of the available treatment facilities.

The environmental sector plays an important role in environmental issues and environmental protection in the territory of Port of Vlora. This sector works to guarantee a healthy and sufficiently ecological environment for current generations and those to come, based on the principle of sustainable development. Maritime and land protection is provided by coordinating work with port security), the fire defense station and the port captain. The successful marine incidents with oil spills, from the fall of fire in the territory of Vlora Port and various emergencies is achieved by managing these situations on the plan basis.

1.8 Montenegro - Ministry of Capital Investment (Ports of Bar & Kotor)

The Port of Bar is located on the western area of the city of Bar. Its ownership status is Landlord port (public ownership and contracted private operations regarding service

providing). The Port is a multipurpose port featuring quay length of 1,440 m with dedicated terminals for container ships, general cargo ships, RO RO and cruise ships, and covers the total area of 518.790 m^2 with nine berths and annual handling capacity of 750,000 TEU and 6.0 million tons of general cargoes.

The entire area of the port of Bar, with the exception of PIER V (Passenger Terminal), is located in the free zone regime. The free zone is mostly operated by Port of Adria (approx. 90% of the Zone).

However, the Free Zone status is acquired by concluding service contracts in the Free Zone with "Port of Bar" JSC, according to the Law on Free Zones and regulative for the Zone (The general rules of doing business in the Free Zone). The users of the Free Zone enjoy numerous benefits under the Law on free zones and other regulations. These include:

- All economy activities can be carried out in the Free zone (except for those jeopardizing environment, people's health, material goods and soil safety);
- Complete equality of investors from abroad is secured in terms of investment rights, acquisition of ownership of the built facilities and activities organization in them;
- The use of ground and facilities in the free zone is enabled on the basis of long-term lease as per fixed conditions;
- Customs, customs duties, and value added tax are not paid for the goods imported into the Zone, regardless of the type of imported goods and their purpose in the Zone;
- Goods imported in the zone can stay there indefinitely;
- The goods can be temporarily taken out from the Zone to the remaining part of the country or imported in the Zone from the remaining part of the Country to be processed, installed, tested, surveyed, repaired, commercially presented etc.;
- The goods dispatched to the remaining part of Montenegro area to be further traded are subject to payment of customs, customs duties and VAT at the moment of leaving the Zone, where the customs and customs duties are paid only for the foreign components in the goods;
- Zone user does not pay profit tax for legal entities;
- Investing the capital in the Zone area, transfer of profit and roles are free.

Figure 38 - Port of Bar and Port of Andria terminals

The total of the port area (130 ha) includes developed infrastructure. As mentioned in the type of port, the port of Bar involves two terminal operators: „Luka Bar "AD and „Port of Adria" AD Bar.

The "Luka Bar" AD has a terminal for cereals of the capacity of 30,000 tons and closed conveyor belt of 250 m, in parallel with the railway infrastructure intended for loading/unloading of cereals into/from the silos; terminal for dry bulk cargo with the operational shore of 554 m and depth of the relevant sea area of 14 m, equipped for transhipment and storage of various types of dry bulk cargo; terminal for liquid cargo; terminal for general cargo, roar cargo and containers with open and closed storages and freezers, passenger terminal with five berths for passenger ships and ferryboats.

The Port's operative quays are the following:

Quay Volucija

- length: 554,40 m;
- depth of the aquatorium: up to 14 m;
- sea level: + 3,00 m;
- type of construction: reinforced-concrete structure;
- laid down on pillars;
- permitted working load per unit area: 6 t/sqm;

Old quay

- length: 280 m,
- depth of the aquatorium: up to 6,20 m,
- sea level: +2,50 m,
- type of construction: concrete gravity wall.

New petroleum berth

- wheelbase between two wharfs: 66 m,

- depth of the aquatorium: 13,5 m,
- sea level: +2,50 m.

Berth 26 on Terminal II

- length: 239 m,
- depth of the aquatorium: 10,5 m,
- sea level: +3,00 m,
- type of construction: reinforced-concrete structure,
- laid down on pillars,
- permitted working load per unit area: 4 t/ sqm.

Southern quay of Terminal III

- length: 135 m,
- depth of the aquatorium: 8,10 m,
- sea level: +3,00 m,
- type of construction: reinforced-concrete structure,
- laid down on pillars,
- permitted working load per unit area: 4 t/sqm.

Operative quay of Terminal V

- length: 345 m,
- depth of the aquatorium: up to 6,5 m,
- type of construction: concrete gravity wall.

The port of Port of Adria" AD is located next to the „Luka Bar" AD. It has a container terminal with 330 m of operational shore and depth of 12 m, as well as a state-of-art container lift (40t) and open storage area of the capacity of 2500 TEU and 180 refrigerated containers. It also has two quays for general cargo equipped with port lifts and closed storage area of 7,6 ha and open storage are of 5.86 ha.

OPERATIONAL QUAY	BERTHS	DRAFT (m)	LENGTH (m)
Pier 1, south quay	1.1	11,5	165
Pier 1, south quay	1.2	11,5	165
Pier 1, north quay	1.3	11,0	165
Pier 1, north quay	1.4	11,0	165
Pier 2, south quay	2.1	11,0	155
Pier 2, south quay	2.2	11,0	155
Pier 2, west quay	2.3	10,5	190
Pier 2, north quay	2.4	11,0	140
Pier 2, north quay	2.5	10,5	140

Figure 39 - Port of Adria Area Diagram

Figure 40 - Port of Bar Satellite Picture

The data used for the compilation of the current SWOT analysis are results of the research activities implemented for both the current and the previous deliverables of the project (namely Del. T.1.2.1, Del. T.1.2.2 and T.1.3.2). For the collection of these data, the contractor has used a number of data collection methods, including **desktop research of official Port Authority and Port Operator material, digital research of available information on the port and its terms of operation, and contacts with the Port Authority and Port Operator's members for the collection of qualitative data.**

Following the findings of the activities and reports already implemented under WP T1, and the findings from the means used for the elaboration of this report, the SWOT Analysis hereby aims to point out which are the Strengths, Weaknesses, Opportunities and Threats identified with regards to the Port Regulations and Action Plan for Waste Management in the Port/Ports examined by each involved Partner. The SWOT tool, could be then exploited by the competent authorities to suggest specific measures, co-operate, and implement strategies towards the improvement of the examined ports and documents.

2. Presentation of Port Regulations

2.1 Italy – Port Network Authority of the Ionian Sea (Port of Taranto)

The Ionian Sea Port System Authority has approved and adopted, by order no. 09/21 of 22/03/2021, the Revision of the "**Regulation for the performance of port operations and services in the port of Taranto**", adopted pursuant to art. 16 of Law No. 84 of 28 January 1994 and subsequent amendments and additions and in compliance with the provisions of Ministerial Decrees No. 585 of 31 March 1995 and n. 132 of 6 February 2001.

This Regulation defines the typology of port operations and services, the maximum number of authorizations established for both categories for the reference year and the procedures for submitting and issuing the authorizations in question.

Authorizations shall be valid for one year for authorized undertakings, unless a longer period is required in relation to the operational programme appropriate to the period for which authorization is sought.

Port operation (such as loading, unloading, transshipment, storage, movement in general of goods and any other material carried out in the port area) are subjected at the following specific authorizations from the Authority:

- Authorization for third parties: authorization for third parties allows the authorized company to carry out port operations for anyone who has the right to do so,
- Authorization on own account: authorization on own account allows the authorized company, set up by the same port user, to carry out port operations relating to goods or materials directly related to the production activity of the companies themselves,
- Authorization in self-production: the authorization in self-production allows the maritime carrier or shipping company or charterer or, for them, their representative, to carry out port operations with their own resources and means, in accordance with the procedures set out in art. 8 of the Ministerial Decree no. 585/95.

The main port services[1] offered within the Port of Taranto to the ships that dock are listed below:

a. technical - nautical services in turn divided into:
    - boaters;
    - trailer;
    - piloting;
    - mooring;
b. and general interest services like:
    - bunkering;
    - waste collection;
    - port chemist;

[1] Specialist services that are complementary and ancillary to port operations

- water supply;
- fire prevention;
- anti-pollution.

In paragraph 2 of article 2 of the regulation n. 09/21, are identified the following port services, some carried out through duly authorized port operators:

1. Weighing;
2. Unmarking, counting and sorting of the goods;
3. Cleaning of goods and reconditioning of packages;
4. Attachment and detachment of hoses;
5. Surveillance and anti-theft surveillance;
6. Freight shuttle service;
7. Transfer of cars into the policy;
8. Hot charter of mechanical means;
9. Filling and emptying containers;
10. Porter service;
11. Complementary operations to the lashing / derizzaggio[2] activity.

Also, by Ordinance n° 12/2020 of 05/06/2020 the Ionian Sea Port System Authority approved the "**Regulation for the regulation of the service of collection of waste from ships in the port of Taranto**" which applies to all ships arriving in the port of Taranto, in the dock or at the bottom, which must confer waste. Military warships and auxiliaries or other vessels owned or operated by the State if used for non-commercial state services are excluded from the scope of this Regulation.

This Regulation refers to the main legislation in force in this field and in particular to:

a. Marpol 73/78 of 2nd November 1973 "International Convention for the Prevention of Marine Pollution Caused by Ships and the protocol for intervention on the high seas in the event of pollution caused by substances other than hydrocarbons, with annexes, adopted in London on 2nd November 1973 "ratified by law of 29th September 1980;

b. Law 28th January 1994, n. 84 "Reorganization of port legislation" and subsequent modifications and additions;

c. Interministerial Decree of 22nd May 2001 (Ministries of Health and Environment) containing "Measures relating to the management and destruction of food waste produced on board means of transport that make international journeys;

[2] Operation by which the movable loads embarked on a vessel are freed from the lashings.

d. Legislative Decree 24th June 2003, n. 182 "Implementation of Directive 2000/59/EC relating to port reception facilities for ship-generated waste and cargo residues" and subsequent modifications and additions;

e. Ministerial Decree 17th November 2005, n. 269 "Implementing regulation of articles 31 and 33 of legislative decree no. 22 of 5th February 1997 concerning the identification of hazardous waste from ships, which can be admitted to simplified procedures" and subsequent modifications and additions;

f. Legislative Decree 3rd April 2006, n. 152 "Environmental regulations" and subsequent amendments and additions;

g. Ministerial Decree dated 1st July 2009 of the Ministry of the Environment and the Protection of the Territory and the Sea, "Transposition of Directive 2007/71/EC, which amends Annex II of Directive 2000/59 of the European Parliament and of Council on port reception facilities for ship-generated waste and cargo residues";

h. Decree of the Ministry of the Environment and The Protection of the Territory and the Sea of 22 December 2016 "Transposition of Directive 2015/2087/EC amending Annex II to Directive 2000/59/EC of the European Parliament and of the Council on port reception facilities for ship-generated waste and cargo residues";

i. Circulars and dispatches issued by the Ministry of the Environment and the Protection of the Territory and the Sea – Marine Environmental Department of the Body of the Captaincies of Porto and in particular:

    - Waste collection and management plan of the port of Taranto drawn up by this Port System Authority pursuant to article 5 of Legislative Decree 182/03 approved by resolution of the Regional Council no. 1407 of 12/06/2015 concerning "Plan for the management of waste and cargo residues, produced by ships, in the port of Taranto, pursuant to article 5 of Legislative Decree 182 of 24 June 2003, n. 182 – Approval" available on the institutional website of the Institution. The most recent update of this Plan was approved with D.G.R. of the Puglia Region n. 1203 of July 31, 2020;
    - Regional Plan for The Management of Municipal Waste adopted by resolution of the Regional Council of 13 May 2013, n. 959 of the Puglia Region;
    - Safety and Maritime Services Regulation of the port of Taranto issued by Ordinance no. 70/2011 on 18/03/2011 issued by the local Maritime Authority and subsequent amendments and additions.

The aforementioned Regulation establishes the organization of waste management services that complies with the principles of accountability and cooperation of all the parties involved. It also establishes the need to ensure the rapid delivery of such waste and waste, avoiding unjustified delays while ensuring safety standards for the environment and human health that can be achieved through the application of the best available technologies.

The services that relate to waste management will take place every day, including holidays, and must be carried out mainly by nautical means in compliance with current local legislation on the subject. The masters of ships arriving in the port of Taranto – also for the purpose of planning services – fill out in all its part a form in accordance with Annex III referred to in Legislative Decree 182/03 and, also through the Maritime Agencies, forward it to similarities of what is provided for in art. 1-2 of Order No 234/2016 of the Port Authority on the "Port Management Information System – PMIS".

The Rules of Procedure define the procedures for implementing:

- Service for the collection, transport, treatment and disposal and/or recovery of waste (special waste, waste similar to municipal solids, black water, waste consisting of food products and their residues landed from ships from non-EU countries, coming from the activity of embarkation and disembarkation of goods, etc.) from board merchant ships parked in the port of Taranto;
- Service for the collection, transport, treatment, recovery and/or disposal of bilge water, washing water, sludge with a flash point of more than 60°c and ballast water and ship cargo residues.

The aim of this Regulation is to improve the availability and use of port waste collection facilities. Therefore, in the preparation of the service schedule, the concessionaire company must comply with the undernotations priority criteria for the drafting of the service order:

a. Notifications received;

b. Weather conditions;

c. Positions of ships in the dock or on the quayside.

On the basis of the information acquired and taking into account the priorities, the concessionaire company organizes the work plan of the day, which is communicated to the Maritime Agencies by 10.00 a.m. the previous day for services other than solid waste collection service which, being a mandatory daily service, is carried out for all ships. Any changes may be requested by 12.00 pm by the Agency concerned, in order to allow a possible remodulation of the organization of the service that will be recommunicated by 4.00 pm on the same day.

For specific unscheduled requests coming from the Authorities, the edge, the agencies in order to provide communications, the concessionaire is recognized a maximum time of 4 hours to prepare the service, prepare the vehicle and reach the mooring place (or bottom point) of the ship to be served. The 4 hours will be calculated from the moment the agent or ship command has been able to communicate to the concessionaire the exact time for the performance of the service.

The service of collection and transport of waste from on board ships, to which the Regulation refers, consists in particular of:

a. daily separate collection - including holidays - of municipal solid waste or similar waste from ships and relative transport, disposal and/or recovery at authorized centers;

b. supply of metal or plastic containers with lids, or suitable disposable plastic bags;

c. collection, transport of black and gray water (from toilets and washbasins) and related disposal at authorized centers;

d. collection, transport of waste consisting of food products and their residues landed from ships, national and foreign, coming from non-EU countries according to the procedures provided for by the Ministerial Decree of 22nd May 2001 and disposal at authorized centers;

e. collection, transport, recovery and/or disposal at authorized centers of waste associated with the load such as floorboards, shoring, coatings, packaging material, plywood, paper, cardboard etc. not produced by the ship in the strict sense and originating from the loading and unloading of goods;

f. collection of hazardous and non-hazardous special waste, including expired on-board pharmaceutical equipment and related transport, disposal and / or recovery at authorized centers.

The Regulation referred to above defines that:

- The collection of waste from tankers must be carried out exclusively using suitable plastic containers and with nautical vehicles equipped with spark arrestor nets to the exhaust pipes of the engines and effective fenders, as well as in compliance with the safety standards provided for by the regulations in force;
- The teams, using vessels equipped with separate containers, for separate collection and for undifferentiated waste, go for the collection of bags containing the waste. The operator, by stairway or rope ladder, boards the ship equipped with the work equipment and mandatory documents and presents himself to the Commander or his delegate to inform him of the collection of waste. After receiving the approval, the operator carries out an inspection in the area of the ship, dedicated to the storage of waste, to ascertain the type of waste, its differentiation and its packaging evaluating with the best possible precision the quantity by volume (cubic meters), Marpol category and the EWC code. On each container a preliminary radiometric control with meter will be carried out and in case of positive control the legal procedures will be activated. On each container received, for the purposes of traceability, will be affixed identification label with date, time ship name and EWC code /Marpol category.

  Waste whose nature/ERC code is uncertain should be sampled and characterized in the laboratory.

  Differentiated waste is taken and, where it is found in bulk when possible, laid in bags, and then transhipped into the differentiated containers present on the means of transport. For each conferral of waste made by the ship, the service operator issues

one or more "collection vouchers" in which he records for each type of waste the actual quantity taken and the relative differentiation or not of the same.

The module must always be stamped and countersigned by the ship command even in dematerialized mode.

By Ordinance No. 08/2009, the Ionian Sea Port System Authority adopted the so-called "**Ordinance on Ecological Islands**" which lays down the management procedures and services for the collection of waste oils, filters and spent lead batteries, produced by smaller units, fishing and recreational craft.

That order refers to the main legislation in force in this field and in particular to:

- Law No 84 of 28 January 1994 and subsequent amendments and additions of port legislation reordering;
- Decree of the President of the Republic of 23 August 1982, No 691, and subsequent amendments and additions with which it was established the “Mandatory Consortium of Waste Oils”
- Legislative Decree No 95 of 27 January 1992 and subsequent amendments and additions “Implementation of Directives EEC 75/439 and 87/101 on the disposal of waste oils" regulating the collection, reprocessing, reuse and disposal of waste oils, providing for their transfer to the aforementioned Consortium;
- Legislative Decree No 397 of 9 September 1988 and subsequent amendments and additions, converted with amendments by Law No 475 of 9 November 1988, with which the mandatory Consortium of Spent Lead Batteries and Lead Waste was established and the collection, disposal and recycling of this type of waste was regulated;
- Legislative Decree No 152 of 03 April 2006, "Environmental regulations" and subsequent amendments and additions and, in particular, Article 232 "Ship-generated waste and cargo residues", implementing Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues in Legislative Decree No 182/2000/59/EC on port reception facilities for ship-generated waste and cargo residues;
- Art. 4 of Legislative Decree No. 182 of 24 June 2003 regulating port reception facilities;
- Ordinance No 194/2008 of 02/09/2008 of the Captaincy of Port of Taranto approving and operating the "Provisional plan for the collection and management of waste produced by recreational and fishing units climbing the smaller ports and the ports falling within the Maritime District of the Port of Taranto;
- "Waste collection and management plan of the port of Taranto" approved by Resolution of the Regional Council n. 1407 of 12 June 2015 and in force since 28

November 2004 and subsequent updates. The most recent update of this Plan was approved with D.G.R. of the Puglia Region n. 1203 of July 31, 2020.

2.2 Italy – Central Adriatic Port Authority (Port of Ancona)

The Port of Ancona does not have port regulations for the collection and management of port waste. In fact, all the procedures and protocols adopted are reported in the Plan for the collection and management of waste from ships and cargo residues, adopted with Resolution of the Regional Council of the Marche Region no. 1513 of 29/10/2012, recently being updated to Revision no. 2 of 24 March 2021, soon to be approved.

2.3 Greece – Igoumenitsa Port Authority

The company under the corporate name "Igoumenitsa Port Authority S.A." (OLIG S.A.) has the right to exclusively use and operate the buildings, land, and facilities of the Igoumenitsa's port, located in northwestern Greece, in the administrative region of Epirus, by virtue of a Concession Agreement with the Hellenic Republic.

The ***regulation of internal organization and operation*** of Igoumenitsa Port Authority S.A (***Government Gazette 9550 03.08.2009 amended by the Government Gazette 793 22.08.2018)*** aims at institutionalization of the organizational structure of the Company, the description of the responsibilities of organizational units, the definition of organic staff jobs as well as the determination of the placement and evaluation of the Executives.

The contents of the Regulation are as follows:

- Article 1 - Subject of the Regulation
- Article 2 - Legal Form of Organization and Operation
- Article 3 - Mission, Role and Responsibilities
- Article 4 - Vision of OLIG S.A.
- Article 5 - Activities
- Article 6 - Services of General Financial Interest
- Article 7 - Equity
- Article 8 - Shares
- Article 9 - Management Bodies
- Article 10 - Supreme Standing Committees, Boards and Coordinating Bodies
- Article 11 - The Board of Directors
- Article 12 - Audit Committee
- Article 13 - General Manager
- Article 14 - Procedure for setting up Extraordinary Committees and Councils

- Article 15 - Classification of Services
- Article 16 - Basic structure of Services
- Article 17 - CEO
- Article 18 - Directorate of Administration, Finance & Procurement
- Article 19 - Port Services Directorate
- Article 20 - Development Directorate
- Article 21 - Projects Directorate
- Article 22 - Independent Services
- Article 23 - Transfer, Modification, Completion of Responsibilities. Creation of New Organizational Groups.
- Article 24 - Staff with Term
- Article 25 - Organic Staff Positions - Assignment of Specialties and Organic Positions
- Article 26 - Distribution - Description of Organic Positions by Service
- Article 27 - Procedure for Periodic Evaluation of Organic Positions
- Article 28 - Positioning of Executives
- Article 29 - Evaluation of Managers – Personnel
- Article 30 - Procedure for Amending the Regulation

According to the Regulation (article 3), OLIG S.A. is responsible for the:

- provision of all kinds of port services to users, the upgrade, maintenance, improvement, and development of the port;
- provision of mooring services for ships and the movement of passengers, vehicles, cargo;
- installation, organization, and operation of any kind of port infrastructure;
- undertaking and execution of programs, studies and projects related to the activities of the Port Authority financed by national, Community or other resources;
- undertaking of any activity related to the port projects, as well as any other commercial and business activities in addition to traditional port services (including tourism, culture, fishing, planning) and the organization of port services;
- upgrade of the provided services and infrastructures through technological and organizational modernization;
- care of the aesthetic and functional structure of the port;

- constructive cooperation with the users of the port and the local bodies and authorities;
- constructive cooperation and the undertaking of any activity related to them management and operation bodies of the country's ports;
- undertaking of the duties of "General Manager" of the Port Zone areas in the context of general planning and development of the country's port potential and the planning of national port policy on behalf of the State and society.

To achieve the above, OLIG S.A:

- may establish, by decision of its Board of Directors, subsidiaries and participate to other companies or enterprises that aim at space exploitation and development activities in the area of jurisdiction of the port or in other ports inside or outside the country which have a similar purpose,
- provides consulting services to natural or legal persons, states, or international agencies, especially in the field of transport,
- takes care of the professional training of its employees,
- creates an appropriate research infrastructure and elaborates a wide range of research and studies for issues related to the purposes of the Company,
- participates in activities aimed at promoting issues related to the purpose of the Company, either at European or national level.
- establishes or participates in venture capital companies.

As mentioned in article 9 of the Regulation, the **management bodies** of the company are the following:

- The **General Assembly** of the Company which is its supreme body and decides on each case of the Company,
- The **Board of Directors** is the highest governing body of the Company and forms the strategy and development policy of the Company, while supervising, controlling, and managing its property,
- The **CEO** is a member of the Board of Directors of the Company, who oversees all the services of the Company (except the Internal Service Audit which reports directly to the Board of Directors through the Audit Commission), directs its work, takes the necessary decisions within the framework of provisions governing the operation of the Company, the approved programs, and budgets and the Strategic and Operational Plan.

The article 10, defines the highest boards, committees or coordinating bodies of the Company, which in addition to the Board of Directors (although not institutionalized in its Articles of Association) are:

- The **Directorate Council,** which is a coordinating body of the Company and its mission is to coordinate and ensure the necessary coherence and operation of the Company.
- The **Audit Committee,** which is responsible for supervision of the work of the Internal Audit Service, the care for the effective conduct of the work of internal auditors through guaranteeing their right to be informed of any book, document, file, bank account and company portfolio and have access to any service of the company and the preservation of the independence of the Internal Audit Service and the smooth cooperation with the other operating units of the company.
- The **General Manager,** who is a specialized administrative officer who is appointed by a decision of Board of Directors of the Company by signing a fixed-term contract for up to three years duration (when it is outside the Company's staff) or with internal placement (when belongs to the Company's staff). His responsibilities are determined by a decision of Board of Directors.

The **basic structure of the Services of the Company Organization** of the Port of Igoumenitsa S.A (OLIG SA), according to article 16 of the Regulation, is as follows:

- **CEO** (Chief Executive Officer) is in charge of all Directorates and Independent Services of the Company (except for the Internal Audit Service which refers directly to Board of Directors of the Company through the Audit Committee).
- **Directorate of Administration, Finance & Procurement** consists of 3 departments (Department of Administration, Department of Finance & Department of Procurement).
- **Port Services Directorate consists of a) the Port Support Department and b) the Department of Exploitation of Premises and Facilities.**
- **Development Directorate** consists of a) the Marketing department and b) the Department of Studies, Research and European Programs.
- **Projects Directorate** consists of the Department of Projects, Technical Studies and Environmental Protection.
- **Independent Services**:
    - Internal Audit Service;
    - Legal Service;
    - Independent Department of Informatics and Telecommunications;
    - Independent Press and Information Department;
    - Independent Port Security Department;
    - Administrative Support Office;
    - Office of Organization & Quality Assurance.

With regards of Waste Management, among the Services of General Financial Interest (article 6), Igoumenitsa Port Authority SA, is responsible towards the Port users for a series of actions, including the responsibility for the protection of the terrestrial and marine environment and their observance provisions in force at the time. In this context, the undertaking of initiatives to comply with all standards for waste management, waste and prevention and repair of environmental damage in its area of responsibility in accordance with legislation.

Further, the Regulation, foresees the following (main) relevant activities per Directorate:

- **Port Services Directorate (article 19), Port Support Dept. duties:**
    - The coordination and operation of activities for the facilitation of reception of waste from ship and cargo residues; Monitoring of contracts with contractors; monitoring of OLIG SA rights and transfer of financial reports to the relevant Dept. for invoicing and payments.
    - Observation of environmental terms for the collection, processing, removal and final disposal of ship waste and residues.
    - Cooperation with the competent services and Port Services Directorate for unloading and storage of dangerous goods.
- **Projects Directorate (article 21), Projects, Technical Studies and Environmental Protection Dept. duties:**
    - Cooperation with the Port Services Directorate, for the control of environmental terms for the collection, processing, removal and final disposal of ship waste and residues.
    - Cooperation with the competent authorities and Port Services Directorate for unloading and storage of dangerous goods.

The responsibilities analysed in the Regulation of internal organization and operation of Igoumenitsa Port Authority S.A and assigned to each organizational unit may be transferred, in whole or in part, from one organizational unit to another, amended or supplemented, if the working conditions, the technological evolution or the legal provisions require it, only by decision of the Board of Directors of the Company.

The duration of OLIG S.A is set at fifty **(50) years** from the publication of the initial articles of association in the Government Gazette and may be extended or limited by a decision of the General Meeting of the Company.

2.4 Croatia – Zadar County Rural Development Agency (Port of Zadar)

Due to its size and importance, the Port of Zadar has been declared a port of special importance and (international) economic interest for Croatia. The Gaženica passenger port is managed by the Zadar Port Authority. According to the Ordinance on terms and conditions of use of the port, the port area is under the jurisdiction of the Zadar Port Authority, the area of

the sea RORO passenger port Gaženica is called the Ferry-passenger port Gaženica. Except for this area, the Zadar Port Authority also manages the following areas:

1. Zadar passenger Port
2. Cargo port Gaženica
3. Vela Lamjana fishing port
4. Anchorage.

Maritime passenger traffic takes place in the area of the Passenger Port of Zadar, which is located on the Peninsula and in the area of the sea RO-RO passenger port Gaženica, ie Ferry-passenger port Gaženica.

The basic legislative framework for the activities of the Zadar Port Authority is regulated by the provisions of the Maritime Property and Seaports Act and the Maritime Code.

Pursuant to Article 56, 56 and 58 of the Maritime Code (Official Gazette nos. 181/04, 76/07, 146/08, 61/11, 56/13, 26/15, 17/19), Article 3 Paragraph 1 Item 7 of the Decree on the conditions to be met by ports (Official Gazette 110/04), Article 62, paragraphs 1 and 2 of the Ordinance on the conditions and manner of maintaining order in ports and other parts of inland waters and territorial of the Republic of Croatia (OG 90/05, 10/08, 155/08, 127/10, 80/12, 56/13, 7/17), Articles 4 and 5 of Directive 2000/59 / EC, IMO guidelines MPEC.1 /Circ.834/Rev.1.1 from March 2018, and Article 19, paragraph 1, item 11 of the Statute of the Zadar Port Authority, the Management Board of the Zadar Port Authority adopts the Ship Waste Management Plan in the port area which it manages. The plan is updated every three years.

The Ship Waste Management Plan prescribes the acceptance and handling of ship accumulated waste and ship cargo residues in the area under the management of the Zadar Port Authority (hereinafter: ***the Port Authority area***);

The area of the Port Authority includes the land and sea part as stated in the Decision on the Establishment of the Zadar Port Authority (Official Gazette No. 19/97, 21/02, 154/03, 132/06, 127/07, 155/13, 83/15);

The Plan regulates:

- methods and procedures for the management of ship accumulated waste and ship cargo residues from ships entering the port area of the Port Authority,
- protection of the marine environment from the discharge or dumping of ship-generated waste,
- protection against pollution of the land area of the Zadar Port Authority;
- All natural and legal persons using the port are obliged to comply with and comply with the provisions of the Maritime Code of the Republic of Croatia (Official Gazette 181/04, 76/07, 146/08, 61/11, 56/13, 26/15 , 17/19), and the Ordinance on the order

and conditions of using the port in the port area under the jurisdiction of the Zadar Port Authority.

TYPES AND MANNER OF WASTE COLLECTION FROM SHIPS

The manner, amount of collection and transport of waste from ships that normally come to the Port Authority area depends on the category of waste, the required dynamics and the location of waste collection.

Of the permanent containers for waste collection in the port area under the jurisdiction of the Zadar Port Authority, there are containers for municipal waste in the City Port of Zadar or passenger Port Gaženica and a container for receiving waste oils, oiled cloths and oil filters in the fishing Port Gaženica

Other types of waste are collected by authorized concessionaires after prior notice.

Oily liquid and solid waste

Acceptance of oily waste from ships shall be carried out by authorized concessionaires with prior notice in accordance with Rule 38 of Annex I of the MARPOL Convention,

Ship's unloading pumps for oily waste must support a transshipment capacity of not less than 6 m3 / h,

When pumping oily waste liquids must be heated to a temperature of not less than 60 ° C,

Solid oily waste must be suitably packed in marked bags or in non-returnable containers,

Oiled wastewater is collected after the chemical-physical analysis in specialized tank trucks,

Fishing vessels in the area of loading/ unloading points for fishing boats in the Port of Gaženica, can dispose of small quantities of waste oils (up to 100 liters) in containers for receiving oil and marine municipal waste in containers for receiving municipal waste,

Smaller vessels, and yachts with up to 12 crew members, which dock in the city port can, only with prior notice, dispose of waste oils (up to 100 liters), while marine municipal waste can be disposed of in containers for receiving municipal waste.

Hazardous waste

Disposal of various types of hazardous waste, which is not listed in the Plan, is possible, with the prior consent of the Port Authority, and with the agreement of the selected Concessionaire. Hazardous waste is taken for treatment to authorized processors of this type of waste.

Faecal waters (Annex IV of the MARPOL Convention)

Faecal water is collected by tank trucks by an authorized concessionaire, after which the concessionaires take it to the central city treatment plant.

Ship waste

Plastics (Annex V of the MARPOL Convention - Category A)

Upon arrival of the ship, the acceptance of plastic from the ship by the authorized concessionaires must be performed separately and taken away in specialized plastic containers and taken away for recycling separately from other categories of waste.

Food residues (Annex V of the MARPOL Convention - Category B)

The ship must not dispose of such waste in municipal waste, but hand it over separately for disposal and harmless disposal to an authorized concessionaire.

Ship-generated municipal waste (Annex V of the MARPOL Convention - Category C)

Acceptance of municipal waste from the ship is performed by the authorized concessionaire with prior notice. This category of waste is transported by specialized metal containers (containers) with a volume of 7m3.

Edible oils (Annex V of the MARPOL Convention - Category D)

This category of waste is collected in the containers of the vehicle of the selected concessionaire and taken to the final treatment of waste.

Incinerator ash (Annex V of the MARPOL Convention - Category E)

This waste category is collected by ADR vehicles for final waste treatment.

Working waste (Annex V of the MARPOL Convention - Category F)

Working waste must be suitably packed in marked bags or in non-returnable containers, and acceptance by the concessionaire is done in specialized containers separately from other waste categories.

By-products of animal origin not for human consumption (Annex V of the MARPOL Convention - Category G).

Upon the arrival of the ship in international traffic, the concessionaire usually accepts animal by-products from the ship with specialized tanks. Waste is disposed of in containers with lids marked “for disposal only” and transported from the port to the collection point and stored within the registered facility. Subsequently, the incineration of the same waste is organized.

Fishing equipment (Annex V of the MARPOL Convention - Category H)

This category of waste is collected by concessionaire vehicles for final waste treatment.

Electronic waste (Annex V of the MARPOL Convention - Category I)

This category of waste is collected by concessionaire vehicles for final waste treatment.

Remains of cargo on ships (Annex V of the MARPOL Convention - categories J and K);

This category of waste is collected by specialized vehicles for final waste treatment.

Depending on the type and amount of waste, cargo residues are disposed of in a convenient manner by prior agreement with the selected Concessionaire. It is the consignee's responsibility to dispose of cargo residues from ships at his own expense.

The costs of accepting the remains of cargo from the ship shall be reimbursed by the user of the receiving devices.

Exceptionally, the ship may forward to the next port without delivery of cargo residues if it is evident from the submitted data that there is enough space on board to accommodate cargo residues on board to the port where the remaining cargo will be delivered to receiving facilities.

Exceptionally, the Master's Ooffice may order the ship from 5.10. of this Article to unload cargo residues before leaving the port if there is information that the port of destination does not have a suitable receiving device or the port of destination is unknown and there is a risk that the cargo remains could be thrown into the sea.

The Harbor Master's Office shall prohibit the departure of the ship if it does not act in accordance with the order referred to in paragraph 5.11. of this Article.

The waste categories listed in Item 5. of this Plan are collected in the vehicles of the authorized concessionaire only with prior notice by the shipping agent. The concessionaire is obliged to have a valid permit for the collection of a certain type of waste and is obliged to notify the Port Authority of any changes related to the permit.

APPLICATION FOR SHIPMENT OF SHIP WASTE

Requirements for reporting the delivery of ship-generated waste by ships, is used to better plan waste collection operations and avoid unnecessary delays for ships that provide services to authorized concessionaires.

Ship's agent (except for Croatian warships and public ships, fishing boat or sports and leisure vessels authorized to transport no more than 12 passengers) before arriving at the port of Zadar, is obliged to fully and accurately report to the Port Authority and the Port Authority all items of ship waste and cargo residues that are planned to be delivered at the port and to enter all basic data, in accordance with Directive 2000/59/ EC and the MARPOL Convention and the IMO Directive. Ship waste is reported via the CIMIS application system, i.e., via the "Ship Waste Report" form, in order to approve the acceptance of the ship in the port and plan waste acceptance operations and avoid delays of ships using port waste collection devices.

They are also obliged to submit:

- at least 48 hours before arrival for the area under the management of the Zadar Port Authority;
- after finding out at the port of departure, if the information is available less than 48 hours before arrival in the area under the management of the Port Authority;
- immediately before departure from the previous port, if the duration of the trip is less than 24 hours.

The notification form prescribed by the Plan is an integral part of it and is submitted to the competent institutions through the information system CIMIS - Croatian Integrated Maritime

Information System.

THE COURSE OF WASTE COLLECTION FROM SHIPS

The Master of the ship is obliged to send to his maritime agency the form "Report of Ship Waste".

The maritime agent is obliged to forward the request for the needs of waste collection to the selected Concessionaire upon the request received by the ship,

The maritime agent of the ship and the selected Concessionaire agree on the time and manner of taking over the ship's waste or cargo residues,

The Maritime Agency is obliged to inform the Port Authority about the planned work, the name of the Concessionaire who will perform it and the estimated time in which the planned work will be performed;

The Concessionaire may take oily water samples to determine the chemical-physical constituents of the oiled waste;

After the completion of the work, the Concessionaire is obliged to issue a Waste Delivery Receipt (Appendix 7, Form 07/18) to the Master of the ship, and the ship is obliged to forward a copy of it to the shipping agent.

A copy of the signed and stamped Waste Delivery Receipt shall be submitted by the maritime agent to the competent authorities via the CIMIS system.

All waste from ships must be collected separately in accordance with the Annexes to MARPOL 73/78 of the Convention and the waste categories of MARPOL 73/78 of the Convention.

NOTES FOR INADEQUATE SERVICES

Upon receipt of the remark on the inadequacy of port facilities for receiving waste from ships, the person responsible for the implementation of this Plan will take the necessary corrective actions to eliminate the inadequate service and obtain the satisfaction of service users. Inadequacy of port reception devices for ship waste with a description of the reasons for the problem, can also be reported to the competent Harbor Master's Office.

DATA COLLECTION AND SUBMISSION REQUIREMENTS

Concessionaires are obliged to submit in writing to the Zadar Port Authority:

Quarterly monthly reports on the total amount and type of waste collected in the area of the Port Authority, 30 days after the end of the quarter.

Annual report on the total amount and type of waste disposed of in the area of the Port Authority, submitted within 30 days after the end of the calendar year.

The reports shall be submitted to the competent department of the Port Authority, in charge of the Implementation of this Plan.

COST COLLECTION SYSTEM

The cost collection system is determined through the maximum amount determined on the day of signing the concession agreement with the Concessionaire.

TEMPORARY WASTE DISPOSAL LOCATIONS

Locations of temporary disposal of waste from port activities are listed in the internal regulations of port concessionaires.

In the port area under the jurisdiction of the Zadar Port Authority, about 120 tons and about 60 m3 of ship waste are disposed of annually.

PERSON RESPONSIBLE FOR IMPLEMENTING THE PLAN

The Department for Operations and Security and Technical Affairs and Maintenance of the Zadar Port Authority is in charge of the implementation of this Plan.

2.5 Slovenia - RDA North Primorska d.o.o. (Port of Koper)

The document of the **Port Regulations** applicable to the Freight Port of Koper was issued in March 2020 (Anon., 2020) and is available on the Port's website. The document includes 58 articles and in the first six of them, there are introductory provisions where one can find (Article 1): The areas for which internal rules for safe and uninterrupted port operation takes place, which are:

- arrival of ships and vessels;
- berthing of ships and vessels;
- anchoring of ships and vessels;
- shifting and warping of ships and vessels;
- repair work on ships, vessels and other vehicles in the port area;
- activities performed by third parties in the Freight Port of Koper area;
- handling accidents;
- environmental protection;
- waste handling;
- dangerous goods and hazardous substances;
- supply of ships and other means of transport;
- use of fuel in the port;
- noise;
- occupational health and safety, fire safety;
- port protection and safety; entry, movement and stay in the port;
- traffic in the port area;

- prohibited activities;
- exceptional occurrences;
- removal of a person from the port and withdrawal of entry permit;
- supervision and implementation of these Regulations.

Article 2 defines that the water area of the Freight Port of Koper consists of the port aquatorium, which includes the shipping channels, port basins and quays for mooring ships and watercraft, as well as some areas extending into the land of the cargo port:

- the entire length of the Rižana River, which runs through the port area;
- the outflow channel of the Škocjanski zatok wetland.

It is expressly stated that the area Freight Port of Koper is under customs control. Articles Anon. (2020) are summarized in the Table below.

Table 3 - Summary of articles in the document Port Regulations for the Port of Koper (Anon., 2020).

Article(s)	Covered topic
1–2	areas for which internal rules for safe and uninterrupted port operation
3–6	to whom these regulations shall apply, processing personal data
7–10	arrival, anchoring and berthing of ships and other related activities performed during the implementation of cargo handling services
11–12	rules for the repair work on ships and other vehicles in the port area
13	activities performed by third parties in the Port of Koper
14	handling of accidents
15–23	environmental protection
24	supply of ships and other means of transport
25	use of fuel in the Port of Koper
26	noise
27–28	occupational health and safety and fire safety
29–31	port protection and safety
32–34	entry into the port and movement within it
35–37	Other activities related to the entry, movement and stay in the freight Port of Koper
38–51	Traffic in the Port of Koper area
52	entry prohibited conduct in the freight Port of Koper
53	Removal of a person from a freight Port of Koper
54	withdrawal of entry permit (i.e. access pass)
55–58	final provisions

A focus is now placed on the articles within Environmental Protection, specifically Articles 16–20, which are summarized in subsection 6.1 Waste Handling. They state the following:

Article 16

All persons in the Freight Port of Koper must treat waste in such a way as to protect the environment and human health and to prevent or reduce the harmful effects of waste generation and handling.

Article 17

Any person who by carrying out activities in the Freight Port of Koper generates waste, shall notify the Concession Holder and arrange for its collection and disposal.

No waste may be incinerated onboard when the ship is moored in the port.

Any waste leaving the port must have an accompanying record sheet prepared in line with the applicable law.

Waste management shall proceed in line with the applicable law, these Regulations and internal rules of the Concession Holder.

As hazardous waste shall be treated any substance or object classified as such in accordance with the applicable law.

Article 18

Persons who perform activities in the Freight Port of Koper area must conclude an agreement with the Concession Holder regarding their obligations relating to waste collection and disposal. Any such agreement shall be concluded in line with the provisions of the applicable law, these Regulations, and the internal rules of the Concession Holder. Without the conclusion of such an agreement, the Concession Holder shall not permit the performance of activities in the Freight Port of Koper area.

Owners and tenants of premises in the Freight Port of Koper are obliged to keep appropriate containers for separate waste collection and waste disposal, to adhere to legal acts and to keep the record sheets on their behalf. They can collect hazardous waste exclusively on their premises in a way as to prevent environmental impact and based on the consent of the Concession Holder.

It is not allowed to store and recycle waste in the Freight Port of Koper without the permission of the Concession Holder. In the case of construction, maintenance and similar works, the performer of works is obliged to provide for separate waste collection and to arrange for its removal from the Freight Port of Koper in accordance with the legislation in force. All performers of construction work must provide that construction waste is removed from the Freight Port of Koper no later than on the date of work termination which shall be notified to the Concession Holder. When leaving the Freight Port of Koper area, the haulers who are engaged in the transport of construction waste are required to display each time at the gate the appropriate authorization for waste removal, together with a waste record sheet. In case the performer of work fails to provide for the removal of construction waste on work termination, the Concession Holder shall do so at performer's expense.

Waste generators in the Freight Port of Koper area must report annually, on their own behalf, the quantities and types of waste to the Concession Holder and other entities to whom they are obliged to report in line with the applicable legislation.

Haulers involved in waste transport must have a valid waste transportation permit issued by the competent environmental authorities. In the case of hazardous waste transport, vehicles must also comply with the requirements laid down by the applicable law.

Article 19

Ship-owners or agents shall notify the Concession Holder about the required ship-generated waste disposal 24 hours prior to ships' arrival, by specifying the type and quantity of waste to be accepted by port reception facilities. Ship-generated waste shall be collected at least twice a day. All other matters related to the reception of ship-generated waste shall proceed in line with these Regulations, the applicable law and internal rules of the Concession Holder.

Article 20

The supervision of handling, transport and acceptance of waste shall be carried out by the Concession Holder. If inappropriate waste handling poses a serious threat to human life, health or material assets, the Concession Holder shall immediately take steps to prevent the person who represents threat from continuing to operate, to remove any such person from the port in accordance with the provisions of these Regulations and take the necessary measures to prevent danger at the expense of the person. The sphere of waste handling is regulated in greater detail in the Concession Holder's internal acts.

Articles 21–23 describe rules for handling dangerous goods and hazardous substances and are not repeated here.

2.6 Serbia - Eco Zone Ada Huja

The existing legislative framework of the Republic of Serbia in the field of exclusively water transport consists of three laws, as follows:

- Law on Navigation and Ports on Inland Waters ("Official Gazette of RS- 73/2010, 121/2012, 18/2015, 96/2015 - other law, 92/2016, 104/2016 - other law, 113/2017, 41/2018, 95/2018, 37/2019 and 9/2020);
- Law on State Affiliation and Registration of Vessels ("Official Gazette of RS - International Agreements", No. 10/2013, 18/2015, 83/2018);
- Law on Maritime Navigation ("Official Gazette of RS - International Agreements", No. 87/2011, 104/2013, 18/2015, 113/2017 - other law and 83/2018).

The Law on Navigation and Ports on Inland Waters has started the reform of the inland water transport sector, as well as the procedure of harmonization of domestic legislation with EU regulations in this area. This law transposed eight EU directives, regulations and communications into domestic legislation, and took into account resolutions, agreements, decisions and recommendations issued by the Danube Commission, the United Nations

Economic Commission for Europe (UNECE) and the Sava Commission. The Law on Navigation and Ports on Inland Waters regulates the matter related to navigation safety, namely: waterways and their technical maintenance, navigation, vessels and their ability to navigate, crew, port authorities, and the application of new technologies that affect the leveling navigation safety such as River Information Services (RIS) and Ship Traffic Management Services (VTS). The Law harmonizes domestic legislation with the provisions of the EU Regulation on conditions under which non-resident carriers may transport goods and passengers by inland waterways of member states, with the transitional and final provisions of the Law postponing the application of the provisions of this Regulation until full membership E U. In addition to these issues, the institutional set-up of the inland water transport sector has been regulated. The law prescribes the competencies of the Directorate for Waterways, as a body within the Ministry of Construction, Transport and Infrastructure, which is responsible for technical maintenance of international and interstate waterways, while the former Federal Public Institution Yugoslav Inland Navigation Register "Jugoregistar" is defined as the Directorate for determining the seaworthiness of ships, also in the legal status of the bodies within this ministry. This law started the process of reforming the port sector of the Republic of Serbia. The legal status of ports and ports in the Republic of Serbia is regulated in accordance with the modern approach to port management, which is generally accepted and defined in the world today in the "Communication on European Port Policy" from 2007. The law is based on the fundamental principle that ports and harbors are goods of general interest and that as such their port areas and land are in public ownership. This leads to a distinction between public law, ie strategic and administrative management of ports performed by the Port Management Agency, and management of commercial port activity which is left to port operators (private sector) as entities that are carriers of economic activities in the port. The law stipulates that the port area is determined by the Government on the proposal of the Port Management Agency, which created the assumption that through the potential expansion of port areas, the port system of the Republic of Serbia will be opened to other interested port operators. In this way, the solution of the problem of the current intra-port monopoly, which is one of the basic characteristics of the national port system, will begin. Within the port, the difference between the port infrastructure (operational shores, quay walls, roads, railways, etc.), which is in public ownership, and the port superstructure (cranes, cranes, berths for passengers, administrative buildings, etc.) is clearly defined. which may be privately owned.

Based on the Law on Navigation and Ports on Inland Waters, 20 bylaws were adopted, the most important of which are the Decree on Conditions for Navigation and Navigation Rules, Ordinance on Titles, Conditions for Acquisition of Titles and Authorizations of Merchant Navy Crew Members, Ordinance on Conditions, Manner and the procedure for issuing and replacing, the content and form of the shipping book and boarding license, persons and bodies responsible for entering and certifying data, as well as the content, form and manner of keeping the register of issued shipping books and boarding licenses, Ordinance on health conditions crew members of ships and other vessels, as well as the conditions and manner of performing health surveillance, Rulebook on conditions that must be met by persons

operating a boat, floating body or floating object, program and manner of taking the professional exam, as well as forms, content, issuance and duration of management license, etc. Work on the adoption of the remaining 20 bylaws is pending.

2.7 Albania – Port of Vlora

The Republic of Albania adheres to the Convention "On the Protection of the Marine Environment and the Coastal Zone of the Mediterranean Sea, as well as 6 accompanying protocols":

- Protocol to prevent and avoid pollution of the Mediterranean Sea by ships and aircraft debris or by incineration at sea.
- Protocol on cooperation in combating pollution of the Mediterranean Sea by oil and other harmful substances in emergencies.
- Protocol for the protection of the Mediterranean Sea from pollution of land-based activities.
- Protocol for specific protected areas and for biological diversity.
- Protocol for the protection of the Mediterranean Sea from pollution caused by the exploitation of the continental shelf and the seabed.
- Protocol for the prevention of pollution of the Mediterranean Sea from transboundary and dangerous transportation.

Table 4 - Description of the MARPOL convention and what year each Annex entered into force.

	Year	Regulation	Description
Annex I	1983	Regulations for the Prevention of Pollution by Oil	Covers prevention of pollution by oil from operational measures as well as from accidental discharges. 1992 amendments made it mandatory for new oil tankers to have double hulls and brought in a phase-in schedule for existing tankers to fit double hulls, which was subsequently revised in 2001 and 2003.
Annex II	1983	Regulations for the Control of Pollution by Noxious Substances in Bulk	Details the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk. No discharge of residues containing noxious substances is permitted within 12 miles of the nearest land
Annex III	1992	Prevention of Pollution by Harmful Substances Carried by Sea in Package Form	Contains general requirements for the issuing of detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications
Annex IV	2003	Prevention of Pollution by Sewage from Ships	Contains requirements to control pollution of the sea by sewage; the discharge of sewage into the sea is prohibited, except when the ship has in operation an approved sewage treatment plant or when the ship is discharging comminuted and

	Year	Regulation	Description
			disinfected sewage using an approved system at a distance of more than three nautical miles from the nearest land; sewage which is not comminuted or disinfected has to be discharged at a distance of more than 12 nautical miles from the nearest land.
Annex V	1988	Prevention of Pollution by Garbage from Ships	Deals with different types of garbage and specifies the distances from land and the manner in which they may be disposed of; the most important feature of the Annex is the complete ban imposed on the disposal into the sea of all forms of plastics.
Annex VI	2005	Prevention of Air Pollution from Ships	Sets limits on sulfur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances. A chapter adopted in 2011 covers mandatory technical and operational energy efficiency measures aimed at reducing greenhouse gas emissions from ships.

As in all ports in Albania, Port of Vlora continuously controls all ships for the implementation of this Convention and the provision of all the information on the waste they generate.

Environmental protection is a core value of the Port of Vlore and is a very serious responsibility. The Environmental Management Sector has several duties:

- As a port having environmental services (since 2004), the first action of Port is to implement an extensive environmental policy with a rigorous appraisal procedure for all new projects. Further, to identify any potential risk to the natural environment, the Port conducted a full environmental audit of all marine facilities;
- It is working with other stakeholders to share information and coordinate environmental projects and plans;
- The participation of all of these stakeholders begins with initial planning. They identify environmental problems in the preliminary designs and begin timely investigative programs to gather environmental data. They also help to design procedures and features into the development plan to mitigate environmental impacts that might result from the construction and/or operation of new facilities;
- The Port Environmental Sector hav the port's a role in internal environmental review process and plays an important role in guiding the development proposal through external environmental reviews. In addition, it provides information and interprets complex technical issues for concerned members of the public and affected areas.

Since 2016, the port is certified according to iso 14001: 2004 and 9001: 2008 standards. according to the iso 14001 certification requirements, the port authority during its activity conducts the following:

- Integrates environmental issues in the company's decision-making;

- Constantly educates our report employees and contractors and encourages them to work environmentally friendly;
- Train, educate and information our employees and private entities that conduct their activity at the port, about environmental issues related to their work;
- When developing port projects, it requires contractors to reduce waste through re-use and recycling as well as using recyclable materials in the project with innovative and environmentally friendly ideas.
- Cooperates with the executive director for minimizing unnecessary use of hazardous materials and products and takes all necessary steps to protect the health and the environment if such materials are used or stored in the port area;
- Drafts and refreshes the anti-oil pollutant pollution plan in accordance with local legislation and whenever it is refreshed.

2.8 Montenegro - Ministry of Capital Investment (Ports of Bar & Kotor)

The terms of operation for the Port of Bar (as well as the rest of the country's ports) are described in the Montenegrin National Legislation, mainly by the Law on Ports (Official Gazette of Montenegro 51/2008, 40/2011 – other law, 27/2013 and 18/2019) regulating the legal status, division of ports, management, fees, concessions, order, inspections, and any other issues of importance for the Montenegrin Ports.

According to the categories identified in the Law:

- Ports of national importance are managed by the administration body responsible for ports (Maritime Safety and Port Management Administration);
- Ports of local importance are managed by a legal entity managing coastal zone in line with this law and the law regulating coastal zone management (Montenegrin Public company for coastal zone management).

The rights for development projects regarding infrastructure and supra-structure in Montenegrin Ports are acquired through concession agreements, under the auspices of relevant legislation.

The port related elements of that can fall under this concession regime include:

- the use of the port or a part of the port;
- port infrastructure and supra-structure;
- provision of port services and performing other activities in the port related to such services in economic, transport or technological terms.

Construction, reconstruction and maintenance of port infrastructure and supra-structure according to the BOT system (build-operate-transfer), including also other forms of this system, can also fall under concession framework. The concession period can extend up to 30

years when involving infra and supra structure and 10 years in the case of services. The adoption of the Law on Ports in 2008 (Official Gazette of Montenegro 51/2008) established the competence of a legal entity managing the coastal zone to manage ports of local importance. It also defined the procedure for granting concessions for the ports of local importance, which is to be initiated by the Legal Entity (in this case the Public Company for Coastal Zone Management of Montenegro). The object of concession is the use of the port or a part of the port, port infrastructure and supra-structure, provision of port services and performing other activities in the port that are related to such services in an economic, transport or technological respect.

Furthermore, it is important to mention that the Law on Ports prescribes obligation in providing fulfilment of provisions defined in international and national documents related to: prevention of environmental pollution from ships, protection of the marine environment and costal area and civil liability for damage caused by pollution. Same article prohibits discharge and dispose of solid and liquid waste, oil and oil water and cargo residues from the vessels, as well as other substances that pollute environment in the ports, except in places where there are facilities, equipment and devices for receiving and handling these materials.

Finally, it is noted that the Law on Ports also classifies the ports based on the type of maritime transport and based on their purpose. Government Decision on classification of ports according to the types of maritime transport[3] does the following classification:

- Ports for international maritime transport: Bar, Budva, Kotor, Port of Kumbor – Portonovi, Tivat (Pier I and Pier II) and Zelenika;
- Ports for internal maritime transport: Bar, Budva, Kotor, Port of Kumbor –Portonovi, Luštica Bay, Tivat (Pier I and Pier II), Bonići – Tivat and Zelenika.

Decision on classification of ports based on their purpose[4] classifies the ports into following categories:

- Commercial ports: Commercial port of Bar and Commercial port of Kotor,
- Nautical tourism ports – marinas: Port of Budva, Luštica Bay, Port of Tivat – Porto Montenegro, port of nautical tourism –marina Bar and Port of Kumbor –Portonovi and
- Shipyard ports: Shipyard port Bijela and Shipyard port Bonići – Tivat.

[3] Decision on classification of ports by type of maritime transport (Official Gazette of Montenegro 070/17 of 27 October 2017, 050/18 of 20 July 2018, 046/19 of 07 August 2019)

[4] Decision on classification of ports by purpose (Official Gazette of Montenegro 070/17 of 27 October 2017, 050/18 of 20 July 2018, 046/19 of 7 August 2019)

3. Presentation of the Action Plan on waste management

3.1 Italy – Port Network Authority of the Ionian Sea (Port of Taranto)

The Port System Authority of the Ionian Sea, in compliance with the provisions of art. 5 of Legislative Decree 182/03 has drawn up the "**Waste Collection and Management Plan of the Port of Taranto**" approved by Resolution of the Regional Council n. 1407 of 12 June 2015 and in force since 28 November 2004 and subsequent updates. The most recent update of this Plan was approved with D.G.R. of the Puglia Region n. 1203 of July 31, 2020.

This Plan is updated and approved in accordance with the regional waste planning, in compliance with the aforementioned legislation, at least every three years or in any case in the presence of significant operational changes in the management of the port.

The Authority, with the Waste Collection and Management Plan of the Port of Taranto, is interested in regulating the management of all the different types of waste produced in the port area, not only with regard to waste produced by ships but also with those that are produced and managed throughout the territorial district of competence. Therefore, the plan deals, in its entirety, with the management and treatment of the different types of waste produced and collected in the port area.

Ship waste, which can be classified into special hazardous and non-hazardous waste, which can be delivered and disposed of by accommodation facilities, is distinguished into the following types:

- produced by the ship;
- load residues which consist of any material contained in the holds or tanks of the load and which has remained there at the end of the unloading and cleaning operations.

In turn, the waste produced by the ship is divided into:

- special waste similar to urban waste (kitchen type, other than load residues);
- waste water;
- bilge water;
- associated with the load.

Similarly, cargo waste is classified as:

- slop (washing water);
- ballast waters when they come into contact with cargo;
- surpluses.

Responsibility for the management of waste collected in common use areas and therefore, to be considered "products" in those areas, lies with the Port System Authority of the Ionian Sea.

This waste is divided into two types as it is distinguishable between those found by cleaning the common areas and those collected in the "ecological islands".

Regarding waste from the cleaning service of the common areas, it must be further specified that it comes from ground areas and water mirrors. In fact, in the Port of Taranto there is a service for the prevention and protection of pollution and rapid intervention for the reclamation of water mirrors and port areas by hydrocarbons granted by the local Captaincy of Porto to the Ecotaras S.p.A. Company.

The "Ecological Islands" project, on the other hand, was born from the need to provide users of boating, private and professional, fishing and/or recreational, functional structures for the collection of waste such as spent lead batteries and waste oils.

For both ship-generated waste and cargo residues and waste produced in common areas, the Plan reports the assessment of the type and quantity of waste produced, a detailed description of collection procedures and analysis of the presence of collection facilities in the port area.

The Waste Collection and Management Plan of the Port of Taranto also includes the collection procedures (means and equipment) and management of the different types of waste, identifying the various treatment plants, describing their type and capacity.

Other information that can be found in the Analysis Plan is:

- Cost analysis;
- Tariff system;
- Reports;
- Consultations;
- Regulations;
- Responsibility;
- Initiatives;
- Equipment and processes;
- Plants use;
- Disposal;
- the preliminary environmental report for subjection to the Strategic Environmental Assessment (VAS), in turn composed of the analysis in this regard:
    - bulk, miscellaneous goods, passengers and containers in the Port of Taranto;
        - the geographical classification and location of the port of Taranto;
        - the territorial classification of the port of Taranto;
        - the Site of National Interest (SIN);

- contents and objectives of the Plan with the assessment of the impacts on the various environmental matrices (air, landscape, water, soil and subsoil, noise, marine environment, vegetation, fauna and ecosystems).

3.2 Italy – Central Adriatic Port Authority (Port of Ancona)

The plan for the collection and management of waste produced by ships and cargo residues, prepared by the AdSP MAC and approved by the Regional Council Resolution of the Marche Region no. 1513 of 29 October 2012, is recently being updated to Revision no. 2 of 24 March 2021, soon to be approved.

The aforementioned plan:

- was drawn up in compliance with art. 5, paragraph 1, of Legislative Decree no. 24 June 2003 n. 182, "Implementation of Directive 2000/59/EC relating to port reception facilities for waste produced by ships and cargo residues" and took into account the guidelines prepared by the subcommittee for ESPO waste management programs (European Sea Ports Organization);
- it proposes to plan the collection of waste produced by ships that call or stop in the port of Ancona, at the roadstead and/or oil terminals (including the mono-buoy, island and jetty), and to identify the treatment to which to submit them in compliance with Legislative Decree 152/2006 and subsequent amendments;
- it will be updated every three years and, in any case in the presence of significant changes in the management of the Port;
- is drawn up taking into account the size of the airport and the type of units that land there.

This plan includes:

a) the assessment of the needs of port reception facilities in relation to the needs of the ships that normally land in the port, providing a complete service to the ships (which includes the entire management cycle of urban, special, hazardous and non-hazardous waste both solids and liquids and which includes collection, sterilization where required, transport, treatment, recovery or disposal, in order to discourage the use of landfills at sea) as well as the implementation of separate waste collection, in accordance with the objectives set out in the Plan regional waste management, providing for the insertion of a penalty for ships that do not carry it and corresponding to the amount of the tariff for waste delivered in an undifferentiated way;

b) the organization of a service that meets the criteria of ease of access, efficiency and cost-effectiveness, through the assignment (following a public tender procedure) to a single concession holder with proven specific experience in the sector and equipped with the necessary human resources and materials and in accordance with the provisions of art. 4 of the EU Regulation no. 2017/352;

c) a description of the type and capacity of the port reception facilities;

d) the indication of the port area reserved for the location of the existing collection plants or of any new plants envisaged by the plan, as well as the indication of the areas suitable for waste management;

e) a detailed description of the procedures for the collection of ship-generated waste and cargo residues;
f) the rough estimate of the costs of the port facilities for the collection of waste produced by ships and cargo residues, including those relating to their treatment and disposal, for the purpose of preparing the tender;
g) the description of the system for determining the tariffs;
h) the procedures for reporting any inadequacies detected in the port reception facilities, as well as the preparation of adequate control tools for monitoring compliance with quality standards;
i) the procedures relating to permanent consultations with port users, with the manager of the reception facilities, with the operators of loading and unloading terminals and coastal depots and with other interested parties, such as for example. trade associations;
j) the type and quantity of waste produced by ships and cargo residues received and managed, as well as the implementation of a reduction in waste production, maximization of material recovery, minimization of the dangerous quantity of waste destined for final disposal and improvement the performance of existing plants in accordance with the principles of the regional plan;
k) the summary of the relevant legislation and the formalities for the provision;
l) the indication of one or more persons responsible for the implementation of the plan;
m) initiatives aimed at promoting information to port users in order to reduce the risks of pollution of the seas due to waste being discharged into the sea and to encourage correct forms of collection and transport;
n) a description, if applicable, of the equipment and pre-treatment processes carried out in the port;
o) the description of the methods of recording the actual use of the port reception facilities;
p) a description of the procedures for recording the quantities of ship-generated waste and cargo residues delivered;
q) a description of the methods of treatment and/or disposal of ship-generated waste and cargo residues.

3.3 Greece – Igoumenitsa Port Authority

Igoumenitsa Port Authority (IPA) has an approved **ship waste collection and management plan** that was approved by the Region of Epirus in 2008.

This plan **aims at the compliance of the ports of Igoumenitsa**, Plataria, Sagiada and Sivota, under the responsibility of the Port of Igoumenitsa S.A. **with the directive 2000/59 / EC of the European Parliament and of the Council of 27 November 2000 Communities' on port ship-receiving facilities and cargo residues published in the Official Journal of European Communities (L 332/81 / 28-12-2000) "as amended by Commission Directive 2007/71 / EC**

of 13 December 2007 of the European Communities and JM 8111.1 / 41/09 (Government Gazette 412 NW).

A revised and updated version of the previous plan was submitted for approval under Article 5(4) of the Main Ministerial Decision 8111.1/41/09 (Government Gazette 412 B) in May 2017.

The plan applies to all types of ships, including fishing vessels and recreational ships, irrespective of their country of origin, which enter or operate in the port area. Warships, auxiliary vessels, or other vessels belonging to the State, operated by the State, and currently used exclusively for governmental, non-commercial services, are exempted. The Plan was drawn up based on Greek and European legislation, as well as the revised IMO Directives (MEPC 67/11 – 11/08/2014) and EMSA (Technical recommendations on the implementation of Directive 2000/59/EC Ver.1 Nov. 2016) on ship waste reception facilities.

The **requirements for ship waste collection and management plans,** in accordance with Article 5 and Annex I to THE MAIN MINISTERIAL DECISION 8111.1/41/09 (Government Gazette 412 B), **are fulfilled by this Plan**.

The plans cover all types of ship and cargo residues derived from ships normally entering the port area and are drawn up according to the size of the port and the types of ships entering / docking in it.

The plans should include the following elements:

- an assessment of the need for port reception facilities, based on the needs of ships normally entering the port,
- a description of the type and capacity of the port reception facilities,
- a detailed description of the procedures for receiving, collecting, (intermediate storage, separation/processing and final legal disposal of waste produced on board ships and cargo residues),
- a description of the fee charging system,
- procedures for the notification of alleged deficiencies in port reception facilities,
- procedures for continuous consultation with port users, waste contractors, transshipment station operators and other interested parties, and
- the type and quantities of waste produced on board ships and cargo residues received and transported.

In addition, the plans should include the following:

- a summary of the relevant legislation and formal delivery procedures,
- details of the person or persons responsible for the implementation of the plan,
- a description of any processing equipment and procedures at the port,

- a description of the methods of recording the actual use of port reception facilities,
- a description of the methods of recording the quantities of waste produced on board ships and cargo residues, and
- a description of how waste produced on board ships and cargo residues is disposed of.

More specifically, the contents of the waste collection and waste management Plan of Igoumenitsa's port are **in line with the above elements and are as follows:**

- Chapter 1: A brief introduction including general information, definitions and requirements for waste collection and management plans in ports.
- Chapter 2: Information about the ports for which OLIG S.A is responsible (including Igoumenitsa's port) where reference was made to historical and topological data of the areas, the legal form, mission, vision, activities, role, and responsibilities of the OLIG S.A, basic structure of its services, as well to statistic data of passenger and vehicle traffic.
- Chapter 3: An extended analysis of the legal framework of ship waste reception facilities was made, presenting among others the international and Greek legal framework as well as the European legislation.
- Chapter 4: Types and quantities of waste that produced on ships. This chapter presents both the individual types of waste generated by ships (petroleum waste, hazardous and harmful substances, ozone depleting substances, sewerage, and trash) as well as detailed methodologies for the quantitative assessment of waste and trash ejected by the ships.
- Chapter 5: Assessment of the need for port reception facilities based on port traffic data. Considering the type of ships arriving/ docking in the port of Igoumenitsa, the needs of waste reception facilities are limited to Petroleum waste according to Annex I of the BoD. MARPOL 73/78, Waste according to Annex V of the BoD. MARPOL 73/78, Sewage according to Annex IV of the BoD. MARPOL 73/78.
- Chapter 6: Description of the type and capacity of the waste reception facilities of the ports for which OLIG S.A is responsible (including Igoumenitsa's port).
- Chapter 7: Organizational structure of ship waste reception facilities with special reference to the details of persons responsible for the implementation of the plan.
- Chapter 8: Ship waste receipt and management procedures. In this chapter extended methodologies regarding the collection, transport, processing and disposal of liquid, petroleum and solid waste are presented, while at the same time the registration process, the user consultation process as well as the inadequacy complaint procedure are presented.
- Chapter 9: An extended analysis of the Environmental Management System

implemented by OLIG S.A is presented with reference to relative definitions (environment, environmental policy, environmental performance, stakeholders etc.) and the system requirements according to ISO 14001.

- Chapter 10: OLIG SA has an approved fee charging system, for the receipt and management of liquid and solid waste and cargo residues of ships arriving in the marine areas within its competence. In this context a concise analysis of the fee charging system is made, with reference to decision approving the fee system.
- Chapter 11: Exceptions - Inspections – Controls. This chapter includes extended methodologies regarding the control of the adequacy of storage space on board.
- Chapter 12: Additional information for the port's users.

3.4 Croatia – Zadar County Rural Development Agency (Port of Zadar)

Ports are becoming busier which increases the risk of pollution in their areas. Therefore, EU supports development of green ports which draws special attention to solving the issues of sustainability, waste management and energy efficiency.

In view of the port of Zadar, it should be highlighted that New Port of Gazenica, with an emphasis on the passenger, ferry and RO-RO terminals as the main focus of the study, is located 3,5 km from the Zadar city center which resulted in large relocation and disburdening of the center from the traffic. This relocation can be perceived as an environmental protection action but it is also an introduction to further investigation of waste management solutions and advanced technologies to be implemented within the port and for the port operations.

INTERNAL REGULATIVE FRAMEWORK AND ACTION PLANS

Port of Zadar Authority **does not have a separate environmental policy plan which would consider the European and national environmental legislation**, **as well as the international environmental regulations and which would be designed for the evaluation of the environmental performance of port activities.** However, Port of Zadar acknowledges the importance of environmental protection and issues arising from the port activities and which are related to the port area, sea, noise and air quality. In order to minimize the negative effects on the environment, Port of Zadar Authority **implements a series of activities and regulations on the port area under their jurisdiction.** In this sense, the **main priorities** of the Port of Zadar Authority **include effective management of waste from ships and operations and procedures with hazardous substances from ships.** It also lays down the regulations on the maintenance of order which need to be followed in order to preserve safety and security in the port area.

At this moment environmental issues are tackled within the following internal documents:

- Ship Waste Management Plan (2018);
- Ordinance on determining the class and quantity of hazardous substances from ships (2018);

- Ordinance on determining the class and quantity of dangerous substances that may be handled in the port, that is, that may be carried by a ship entering the port area and places in the port of Zadar where these substances will be handled (2015);
- Regulations on the maintenance of order and terms of using the port area under the jurisdiction of the Port of Zadar Authority also lay down safety and security measures.

It would be useful to implement a separate environmental policy plan within the port of Zadar dealing with the issues of monitoring and reporting of environmental impact in the port area and also laying down specific short-term and long-term actions in view of environmental protection. This document would be multipurpose as it would aim at: waste management, energy and cost savings, better environmental performance, fulfilling legislative targets on carbon footprint.

3.5 Slovenia - RDA North Primorska d.o.o. (Port of Koper)

In the 2019 REMPEC report (REMPEC, 2019, page 6) it is written that "information available in English (which was also available through the website) is the tariff lists and procedural information regarding the delivery of waste in ports and marina. Detailed information on the management of waste from ships, such as the port and marina's waste handling plan, was not available in English." In the list of collected documents it is pointed out that the **Port Waste Handling Plan** is written in Slovenian. It is also stated (page 18) that the Port of Koper had a new **waste reception and handling plan** (WRHP), issued in December 2018, which was currently at the ministry for final approval. It is also written (page 23) that "the relevant parts of the WRHP for the Port of Koper, such as the procedures to deliver the ship-generated wastes, the tariff list, and relevant contact information were translated in English and have been made publicly available. Both texts can be found through the website of Luka Koper." Key statement of the 'REMPEC visit' is condensed in the following statement: "It can be concluded that the Port of Koper has an adequate WRHP meeting the requirements of both the current and new PRF (Port Reception Facilities) Directive, so there are no specific proposed revisions."

Several tables from the ANNEX 1 of the report of REMPEC (2019) that follow from the waste management plan matter deserve attention (Tables 5-7).

Table 5 - Waste reception facilities available in the Port of Koper for each waste type (from ANNEX 1 of REMPEC (2019)).

Type	Yes (Y) or No (N)	If only specific sub-types are accepted or not, please specify
Oily waste from machinery space (MARPOL Annex I)	Y	
Oily cargo residues (MARPOL Annex I)		
Noxious liquid (MARPOL Annex II)	Y	Not yet requested
Sewage (MARPOL Annex IV)	Y	
Garbage (MARPOL Annex V)	Y	
Quarantine/catering waste (according to animal by-products Regulation No 1774/2002/EC)	Y	

Residues from dry bulk cargo including liquid form (MARPOL Annex V)	Y	
Ozone Depleting Substances (MARPOL Annex VI)	Y	Not yet requested
Scrubber waste (MARPOL Annex VI)	Y	Not yet requested
Others (please specify)	Y	

Table 6 - Type of waste accepted by the Port of Koper (from ANNEX 1 of REMPEC (2019)).

Facilities	Waste type	Total number of available facilities	Private external operators	Port authority
Collection	Oily waste	1 x storage facility	0	0
	Sewage	1 x disposal facility	0	
	Garbage	1 x separate storage facility	0	0
	Other waste, incl. cargo residues	1 x storage facility	0	0
Treatment*	Oily waste	0	Exported to Austria	0
	Sewage	0	Through municipal water system	0
	Garbage	0	Partly municipality/ partly external private for quarantine waste	0
	Other waste, incl. cargo residues	0	Solid cargo waste goes to private companies.	Biological treatment = composting within the port for organic cargo
Final disposal*	Oily waste	0	X	0
	Sewage	0	X	0
	Garbage	0	X	0
	Other waste, incl. cargo residues	0	X	0

REMARK: Port of Koper does not have facilities for treatment or disposal of ship waste material, just for collection and for short time storage.

Table 7 - Collection method in the Port of Koper for different waste types and for each collection capacity (in m3) (from ANNEX 1 of REMPEC (2019)).

Waste type	barge	truck	direct pumping	skips/ container	other
Oily waste from machinery space (MARPOL Annex I)	in combination with tank container	24 (2x tank trucks)	N	48	N
Dirty ballast water	in combination	N	N	10	N

Waste type	barge	truck	direct pumping	skips/ container	other
	with closed skips				
Oily cargo residues (MARPOL Annex I)	in combination with tank container	24 (2x tank trucks)	N	48	N
Noxious liquid (MARPOL Annex II): Type X Type Y Type Z Other substances	in combination with tank container	N	N	48	N
	in combination with tank container	N	N	48	N
	in combination with tank container	N	N	48	N
Sewage (MARPOL Annex IV)	N		N	N	52
Garbage (MARPOL Annex V)	in combination with open skips	in combination with open skips	N	10	N
Quarantine waste (according to animal by-products Regulation No 1774/2002/EC)	Y	0,3 (in closed van)	N	N	N
Residues from dry bulk cargo including liquid form (MARPOL Annex V)	Y	In combination with semi-trailer	N	N	50
Ozone Depleting Substances (MARPOL Annex VI)	Y	Y	N	N	N
Scrubber waste (MARPOL Annex VI)	Y	Y	N	N	N

3.6 Serbia - Eco Zone Ada Huja

Complete Action plan (with general and individual goals and time schedule) is not available online, just main ideas for waste management establishing.

Starting from the legally defined competencies of Republic port agency, reviewing the current situation in the field of waste management, analyzed legal, technical and economic aspects, and further activities of Republic port agency in the field of waste management on navigable rivers of RS can be based on the following elements:

1. Monitor the dynamics of the development of the new Waste Management Strategy (for the period after 2019) and, according to the assessment, get involved and influence the definition of policy objectives in the field of waste management and instruments of importance for traffic on navigable rivers in RS.

2. Involve in the development of the Plan for protection of water from pollution in the part related to waste management on navigable rivers in the RS.
3. It is necessary to regulate waste management in more detail by the act which regulates it order in the port.
4. Initiation of activities to review the relationship and compliance with the Law on navigation and ports on inland waters and the Law on waste management, in particular in the following parts:
    - Article 216a. of Law on navigation and ports on inland waters (approval for waste acceptance) and Articles 62 and 70 Law on waste management (permit for collection and transport of waste and permit for waste storage) of these acts, etc.);
    - Article 68, para. 4. Law on navigation and ports on inland waters (hazardous waste from foreign vessels) and relevant provisions Law on waste management, Law on environmental protection, etc. regulations prohibiting the taking over of waste generated on board outside the RS (without the application of the system and permit regime). Here it is necessary to look in more detail at the provisions prohibiting the reception of hazardous waste from foreign ships at receiving stations in ports, taking into account all the circumstances relevant to strategic choices in the field of inland waterway transport and other relevant areas;
    - In connection with the above, consider the possibility of applying the rules, procedures and good practices of other Danube countries in this area (obligation to announce the intention of a foreign shipping company to hand over waste to the receiving station in the Republic of Serbia).
5. Consider the need and initiate amendments to the Law on navigation and ports on inland waters in the following parts:
    - Amendment to the Law on navigation and ports on inland waters and / or by-laws in order to define in more detail the obligations of the port operator which proves that the business will be conducted in such a way that the environment is not endangered, protection of the port area and waters from pollution.
    - Review of penal provisions Law on navigation and ports on inland waters from the point of view, first of all, of their expediency and proportionality, especially when it comes to foreign ships, ie crew of foreign ships
    - Clarify the relationship between the obligations under Article 68 para. 2. of the Law on Navigation and Ports on Inland Waters and Article 23 para. 1, p. 10. Regulations on the conditions to be met by ports, harbors and temporary transhipment points and subsequently, if necessary, propose the necessary

amendments in the part relating to the obligation to "classify" or "sort" "garbage from vessels", ie " household waste generated on board "(first, the extent to which these two norms are intertwined - it is" household waste generated on board "and" vessel waste ", and then whether this waste is" sorted "then" when it is possible "or" must be sorted ")

- Amendments to the Ordinance on the type and manner of collecting data on berths of ships and traffic of goods and passengers in ports, docks and temporary transhipment points on waterways in the Republic of Serbia (Form for submission of statistical data - add data related to waste)
- Amendments to Art. 46th Law on Navigation and Ports on Inland Waters by envisaging that the “ship waste logbook excerpt” be submitted to the Republic Port Agency or in some other way to the Republic Port Agency to be imported into the waste data collection system

6. Review of the compliance of the Law on Navigation and Ports on Inland Waters and by-laws in the part related to the definitions of terms of importance for waste management ("harmful objects and substances", "ship waste", "waste generated on board", etc.).
7. Initiation of amendments to the Law on Navigation and Inland Ports in the part which prescribes the obligation that ports of international importance must be equipped with receiving stations (Article 215, paragraph 5), by abolishing the obligation that all ports from receiving stations of international importance are only those for which justification is determined, or for which it is defined by amendments to the Strategy on the development of water transport, etc.
8. Initiating activities for reviewing compliance and (according to assessment) harmonization of the provisions of the Law on Navigation and Ports on Inland Waters and the Law on Waters, in particular:
    - Article 63 para. 4. of the Law on Navigation and Ports on Inland Waters (it is prohibited to discharge wastewater from: vessels intended for the transport of passengers with more than 50 cabins and passenger vessels intended for the transport of more than 50 passengers) and Article 97 Law on water (which prescribes that it is not no discharge allowed);
    - Article 66 of Art. 3 of the Law on Navigation and Ports on Inland Waters ("The prohibition from Article 63, paragraph 4 does not apply to passenger vessels whose wastewater treatment plants have a type approval certificate) and ZV (which does not provide for this approval, and in addition to the approval necessary is monitoring the efficiency of plant operation and periodic analysis);
    - Article 66 of Art. 1. of the Law on Navigation and Ports on Inland Waters (Discharge of water from the separation plant for bilge water, approved by

the Minister responsible for water management, into inland waters is exempted from the prohibition of Article 63, paragraph 1 of this Law, if the maximum oil residue content after separation, without prior dilution, less than 5 mg / l) and ZV (which does not recognize the approval of this type);

- Article 66 of Art. 2. Law on Navigation and Inland Ports (Prohibition from Article 63, paragraph 1 of this Law does not apply to washing water from cargo residues and substances whose discharge into inland waters is explicitly allowed by law) and ZV (which should be more precisely regulated what is meant, if it is deemed necessary and possible);
- Article 102 (which deals with "devices for taking waste mineral oils, oil mixtures, wastewater and other waste materials from vessels, in accordance with a special law") and Article 215, para. 3. Law on Navigation and Inland Ports which speaks of "receiving stations" ("Ports of international importance must be equipped with receiving stations");

9. Initiation and preparation of special studies that would aim to clarify certain specific issues of importance for waste management that can, in various ways, be related to the prescribed responsibility of the Republic Port Agency (eg international legal responsibility, experience in applying relevant EU regulations, harmonization of mutual relations of different subjects of waste management on navigable rivers).
10. Initiate and develop a set of strategic-planning and study documents necessary for the effective and efficient implementation of the business policy of the Republic Port Agency in the field of waste management:
    - Development of a methodology for monitoring and determining the amount of waste generated on navigable rivers in the RS;
    - Preparation of a Study on monitoring and determination of real quantities of generated waste on navigable rivers in RS;
    - Study on determining the national network of receiving stations (stationary, mobile, combined solutions) on navigable rivers in RS;
    - Feasibility studies for selected technical models of receiving station management determined by the aforementioned study;
    - Plan for determining and implementing economic and financial management models (indirect, direct, combined solutions) and pricing policy, taking into account the polluter pays principle;
11. Preparation of project documentation for receiving / receiving stations (Preliminary solutions, Project for construction permit, Environmental Impact Assessment Study, etc.); Construction or procurement of receiving / receiving stations; Selection of the operator who would manage the receiving station.

12. Promote zero tolerance towards inadequate waste management on navigable rivers in RS.

3.7 Albania – Port of Vlora

Waste management is a big issue, although it seems to have been less challenging in recent years (it was ranked at the top of sustainability issues back in 2004). In the Port of Vlora although there is a greater development over the years and that we will a change regarding the position and the structure that will have, there are small improvements for the waste controlling and management. This comes as a result because Albania still does not have accurate and enforceable legislation for waste management and differentiation of waste in source.

Regarding the Port of Vlora, one of the main topics implemented in cooperation with the captain and the Coastal Border Police is the action plan during the emergencies for a marine pollution, explained below.

Accidents are the main cause of large spills in the category 700 tons caused by the collisions of two or more marine assets, of which 64% of cases occurred in the period 1970-2010. The latest marine pollution by fuel, was in 2014.

Other reasons are defects in the ship's structure, or fires and explosions.

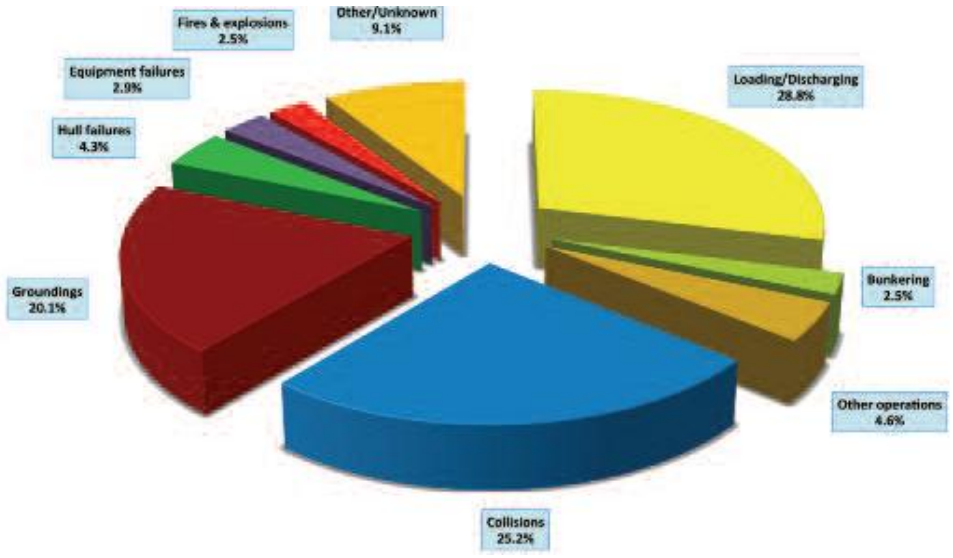

Figure 41 - Causes for marine pollution

ACTION PLAN FOR EMERGENCIES ON MARINE POLLUTION

Local emergency - Local emergency is any situation accompanied and characterized by the presence of pollution or a possible pollution risk of the port water surface, from the pouring of hydrocarbons and harmful and / or hazardous substances, which require the activation of specific procedures for the any scenario according to this plan.

Medium emergency - The situation that can be defined as "extraordinary" pollution, which cannot be managed with port tools and capabilities. Great pollution is the condition when pollution is caused by the pouring in the port aquarium of a lot of hydrocarbons or other dangerous substance ≥7 tonnes or when this amount spreads beyond the aquarium.

National emergency - It implies major emergencies, qualified as "serious pollution", which also exceed the capacities of regional authorities and seeking the mobilization of all possible national resources and includes mobilizing expertise and external resources according to the "National Emergency Plan".

COUNTERING AREAS:

Area 1

Is the port area located within the part of the aquarium and surroundings of the ship.
Much of the small or moderate leaks from ships can be disciplined in this area from the effective use of the oil leakage barrier (boomer).
The general strategy to combat an oil spill in that area is based on the scenario:

- according to which the boom is utilized in any oil spill operation.
    - If the pouring is small or moderate (Level 2, up to 8 m^3) will be engaged a team of 4 to 6 persons.
    - All cooperative agencies will be notified if the shed escalates.
    - Operation on the assortment and separation of pollution within the boom area.
    - At the conclusion of cleaning operations, a supervisory person of the team should determine whether the flow source is closed, pollution is properly cleaned and has no further risks.
    - Only after that, the team can be demobilized.
    - If a large leak occurs (Level 3, over 8 m^3) should be mobilized a 8 to 20 person's team. This includes the announcement of other persons and / or adequate assistance agency.

Area 2

Includes the entire port area that can be affected by a leakage / pollution incident if the strategies applied to A*rea 1* failed.

- All appropriate agencies are reported.
- Determination whether leaks are such as requiring port shutdown. Since this is a decision that has major impacts, should be approved by the Port Director.
- The port captain should notify the situation to all the ships, whether in the harbor or planned to enter.
- Operation on the assortment and separation of pollution within the port area.
- At the end of cleaning operations, a supervisory person of the team should determine whether the flow source is closed, pollution is properly cleaned and are no further risks.

- Before diversifying teams, the Port Director and the Port Captain should evaluate the situation and need to approve the demobilization of the counteraction team.
- The port will only reopen under the direction of the port director, the port captain or an authorized representative.

Area 3

If the leak is moderate (Level 2, total flow to 8 m^3) mobilizes a 4-6 person's counterpart.

- All appropriate assistance agencies are reported, in cases the flow will spread.
- Placement of a boom to prevent the spread of pollution in the harbor or in the bay.
- Performing and assorting contamination activities, necessary to rehabilitate the port area.
- At the end of cleaning operations, a supervisory person of the team should determine whether the flow source is closed, pollution is properly cleaned and are no further risks.
- Only after that, the team can be demobilized.
- If a large leak occurs (Level 3, total over 8 m^3) should be mobilized a team of 8-20 persons.

Communication

POLMES (Pollution Message) - Message used internationally for the transmission of information during incidents caused, or that may cause pollution at sea or on shore.

POLREP (Pollution Report) - Message used internationally to transmit pollution information.

Responsibilities

- Director, Deputy Director of the Port.
  - Performs the tasks foreseen for the Local Responsible Authority according to the "National Contingency Plan" and evaluates and verifies the situation at the scene of the incident and manages / coordinates the actions for activating the Plan in case of operational intervention.
  - Activates the "Anti-Pollution Plan" by notifying and communicating with the Selected Personnel in case of Emergencies.
- The staff of the Environmental Protection Service and the Security Service should coordinate their tasks with the Port Captaincy and other bodies, regional or national, responsible for environmental protection.
- Coordination is carried out through official lines of communication between the Port Directorate and the General Port Authority of Albania and is followed by the Port Security, Environmental Protection Service and the responsible staff of the Port Authority.

- The Environmental Protection Officer and the Security Officer are responsible for environmental protection and safety in the land area, while the Port Captain is responsible for the Port's water area and ships.
- Fire Protection and Rescue Police of Vlora port- It aims to prevent and save the lives of people and property from the risk of fire, control the implementation of law, provide technical assistance, as well as intervention in cases of emergencies and natural and other disasters within the port, but in emergencies even outside it.

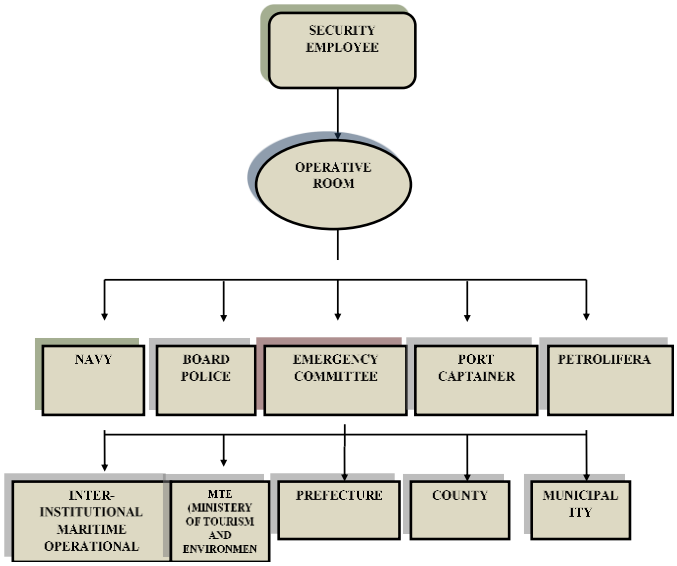

Figure 42 - Notification scheme in cases of marine pollution, first degree

3.8 Montenegro - Ministry of Capital Investment (Ports of Bar & Kotor)

In accordance with the Montenegrin Waste Management Law, the Port of has prepared and implements the Waste Management Plan of Port of Bar, beginning from the period 2015-2018 and up this date. The Waste Management Plan is a key document which defines aims and ensures conditions for sustainable waste management in the area of port of Bar, in order to create those conditions that will ensure:

- Alignment of the working activities with relevant legislative framework;
- Prevention, removal and reduction of risks on environment and human health;
- Minimizing waste quantity and at the same time reduction of operating cost by optimal use of resources and reducing waste disposal costs;
- Development of efficient waste management system in Port of Bar, due to legal obligations, using modern technologies and best practices from other ports;
- Establishment and development of the ecologically sustainable operating, similar to “green port” concept;

- Creation of positive image and optimal relations with the clients, stakeholders and competent authorities.

The main points of the plan refer to the creation of an environmental management system in Port of Bar (regardless of the occasional operator, as the Plan has spatial reference to the total area of the port). It focuses on the need for the treating of vessel generated waste in a sustainable way to avoid:

- Danger for human health;
- Danger to flora and fauna;
- Pollution of water, soil and air above the limits set by relevant legal acts;
- Uncontrolled waste disposal and incineration;
- Explosions, fires and other incidents;
- Noise and unpleasant odors;
- Appearance and reproduction of harmful flora and fauna organisms, as well as development of pathogenic organisms;
- Disturbance of public peace and order.

The Plan forbids the discharge into the sea of oily and polluted water, waste oil, or any other oily and solid material. The basic principles of waste management include the selective waste collection and separation for the sake of secondary recovery, the controlled waste disposal together with the prevention of irresponsible waste management, the promotion of education on waste management and the avoidance of unnecessary delays of vessels caused by waste collection. In that sense the Waste Management Plan is to operate as a tool to promote the goals of waste management without being a hinderance for the normal operation of port users.

According to the 2015/18 version, the main goals of its development had been to:

- Protect environment and its development;
- Protect human health;
- Align of the operations with relevant legal framework;
- Raise awareness on importance of the environment protection and responsibility of each individual;
- Arrange the area of waste management in systematic and planned manner;
- Create conditions which enable that management waste system could be developed on the options most appropriate for the environment protection;
- Remove or reduce waste impact on environment and ensure its regular and legally based management.

To this end the measures undertaken have included the active effort to prevent or reduce waste production and its negative impact on the environment, by improving existing processes and implementation of new approaches, both organizational and technological, according to newer relevant developments, the development of recycling activities, the education of personnel and users via complementary firms, as well as any other means that are deemed as necessary. The measures extend to both the waste owners / producers and to the contractor for the provision of services. More specifically:

1. The owner of the waste is obliged to manage the waste in line with the Law on Waste Management, plans and programmes for waste management and requirements of environment protection.
2. Waste producer is obliged to prepare waste management plan, if the total production of the dangerous waste exceeds 200kg per year, or more than 20 tons of undangerous waste.
3. Evacuation of municipal waste: further development in managing municipal waste involves also introduction of additional metal containers of adequate volume.
4. Improper disposal of waste material on open surfaces shall not be performed.
5. Operator with whom Port of Bar has a contract on management of solid and liquid waste is obliged to keep records on place of origin, quantities and method of treatment of waste generated in port area.

The waste producers will have to keep records and monitor on regular base activities with the aim to minimize generation of waste streams. It is necessary to measure, keep records and conduct analyses on quality, quantity and type of the waste materials and for each waste shipment must prepare record sheets. Records include the following data:

- Data on produced waste and causes of its occurrence
- Waste storage
- Waste disposal and final disposal

The Contracted operator for the waste management services is liable to the Waste producer and the third parties for damage caused by acting contrary to ratified international conventions, laws and bylaws, waste management plan or any other internal rule of the Port. In addition, the operator is obliged to, based on the request of the Port of Bar or competent state authority, provide information on types and quantity of waste, its place of origin, chemical content and characteristics, collection, treatment, transport, disposal, and any other information deemed as necessary.

Operator is also obliged to keep records on waste generation and its movement and update all the data in the log completely after any changes and to keep them for five years.

Finally, the operator is obliged to submit the following reports:

- Quarterly report on total amount and type of waste collected, treated and shipped, within 30 days of the end of the trimester;
- Annual report on total amount and type of waste collected, treated and shipped, within 30 days of the end of the year.

4. Key Actors Involved

4.1 Italy – Port Network Authority of the Ionian Sea (Port of Taranto)

In Italy the main actors and competent authorities involved in port waste management are the following:

- Ministry of Ecological Transition (former Ministry of the Environment, Land and Sea Protection): it is the governing body responsible for implementing environmental policy.

  Established in 1986, it performs functions in the fields of: protection of biodiversity, ecosystems and marine-coastal heritage, protection of the territory and water, policies to combat climate change and global warming, sustainable development, energy efficiency and circular economy, integrated management of the waste cycle, reclamation of sites of national interest (SIN), environmental assessment of strategic works, combating air-acoustic-electromagnetic pollution and the risks arising from chemicals and genetically modified organisms.

  It plays a role of direction and supervision of the activities of the Higher Institute for Environmental Protection and Research (ISPRA) and national parks and marine protected areas. It promotes good environmental practices, sustainable mobility and urban regeneration according to sustainability criteria. He deals with the promotion of environmental education in schools.

  The Ministry avails itself of the collaboration of the Captaincies of Porto - Coast Guard and the Carabinieri Forestry, Environmental and Agri-Food Protection Unit Command (CUTFAA).

- Regions: responsible for legislative powers in the field of regional spatial planning and internal mobility, infrastructure endowment, planning and organization of health and social services; the promotion of local economic development and the organization in the regional context of business services; in the field of discipline, as far as regional interest, cultural activities, the enhancement of environmental, cultural and landscape heritage, the enhancement and regional organization of tourism, regulation, on the basis of specific agreements concluded in the regional context, of financial relations between the territorial authorities of the region for compliance with regional and local public finance policy objectives, as well as in any matter not expressly reserved for the exclusive competence of the State.

- Higher Institute for Environmental Protection and Research (ISPRA): carries out research and experimentation activities; cognitive, monitoring, monitoring and evaluation activities; strategic consultancy, technical and scientific assistance, as well as information, dissemination, education and training, including post-university, in environmental matters, with reference to the protection of water, the protection of

the atmospheric environment, soil, subsoil, marine and terrestrial biodiversity and their crops.

In particular, the main actors and authorities at **local level for the Puglia Region** are:

- Territorial Agency of the Puglia Region for the waste management service - AGER: With regional law no. 20 of 4 August 2016, the Territorial Agency of the Puglia Region was established for the waste management service to which, the associated exercise of public functions related to the municipal waste management service, provided for by Legislative Decree 156/2006, already exercised by the optimal territorial authorities, as a form of cooperation of local authorities, has been delegated.
- Regional Agency for Environmental Protection Puglia (ARPA Puglia): The main functions attributed to ARPAs can be summarized as follows:
    - control of sources and factors of air, water, soil, acoustic and electromagnetic pollution;
    - monitoring of the different environmental components: climate, air, water quality, soil characterization, sound level of the environment;
    - control and supervision of compliance with current legislation and the requirements of the measures issued by the competent authorities in environmental matters;
    - technical-scientific, instrumental and analytical support to the titular bodies with programming and administration functions active in the environmental field (Regions, Provinces and Municipalities);
    - development of an environmental information system to support institutional bodies and available to the social organizations concerned.

The mandatory consortia:

- The 7 Consortia: they guarantee the collection of waste packaging steel, aluminum, paper, wood, plastic, bioplastic and glass collected in a differentiated way, processing and delivery to the final recycler, which can be a single plant or an accredited intermediary.

  The task of each Consortium is therefore to coordinate, organize and increase:

    - the collection of packaging waste delivered to the public service;
    - the collection of packaging waste from industrial and commercial enterprises;
    - recycling and recovery of packaging waste;
    - the promotion of research and technological innovation aimed at recovery and recycling.

Ricrea is the Consortium that since 1997 has been concerned with ensuring the recycling of steel packaging such as cans, tins, caps, drums, cans and cans from separate waste

collection organized by Italian municipalities. In 2019, 80.6% of the steel packaging released for consumption in Italy was sent for recycling, i.e. out of 100 steel cans, cans, cans, buckets or steel lids produced and used in Italy, over 80 were been insured for recycling by the Ricrea Consortium, which guaranteed its rebirth in the form of beams and rods for construction, wrenches, bolts, nails, iron gates, benches and bicycle frames.

CiAl, the National Aluminum Packaging Consortium has been operating for over twenty years with the task of recycling and recovering aluminum packaging at the end of its life cycle, coming from the separate collection made by municipalities. An activity that contributes to the recovery of a precious raw material, avoiding waste and safeguarding the environment. CiAl is responsible for recycling all aluminum packaging introduced in the Italian market. Not only cans, but also: cans and trays for food, even for animals, tubes for creams, preserves or cosmetic and health products, aerosol cans, caps, closures and thin aluminum foil. The Consortium currently collaborates with 5,700 Italian Municipalities, with the involvement of 47 million citizens, 78% of the total. In 2020: 7 out of 10 aluminum packaging was recycled.

Comieco was founded in 1985 by the will of a group of companies in the paper industry interested in promoting the concept of "ecological packaging". In 1998 it became a National Consortium as part of the Conai system and today brings together over 3,300 companies in the paper and cardboard recycling chain: producers of raw materials for packaging and producers of cellulosic packaging, recoverers (waste sorting platforms) and sympathizers. Its main purpose is to achieve the recycling objectives set by the legislation. Comieco is the national consortium that guarantees the recycling of paper and cardboard in Italy. Since its inception in 1985, the percentage of recycling and recovery in Italy has gone from 37% to almost 90%: an average of 10 tons of waste are recycled every minute.

Rilegno is the Consortium that for almost 25 years has had the task of organizing and guaranteeing the prevention, recovery and recycling of wooden packaging throughout Italy. In recent years, the collection and recycling chain managed by Rilegno has become an excellence recognized throughout Europe. The system has created a real 'new' economy that has produced important results both in environmental terms and in the ability to create development and employment. 1.9 million tons of CO2 are saved every year thanks to Rilegno. These are the data in summary: every year Rilegno recovers over 63% of the packaging released for consumption and transforms them mainly into panels for making furniture. In 2019, 1,967,290 tons of wood were collected and recycled; in addition, 839,000 tons of packaging, equal to 60 million pallets, were regenerated and returned to consumption. With its nearly 2,000 consortium members, Rilegno promotes culture and innovation by placing man at the center of a circular wood economy for a sustainable future.

Corepla is the national non-profit consortium for the collection, recycling and recovery of plastic packaging, in which the entire industrial chain participates: producers and transformers of plastic materials for the manufacture of packaging, user companies and

recoverers / recyclers of plastic packaging waste. The Consortium ensures the collection of plastic packaging collected in over 90% of Italian municipalities, guaranteeing the recycling and recovery of the collected material. Thus plastic is not dispersed into the environment and is transformed from waste into a precious resource, also creating new jobs and giving impetus to the circular economy. Thanks to Corepla, over 1,378,000 tons of plastic packaging were recovered in 2019, coming from the separate collection of Italian municipalities.

Biorepack is the new consortium (extended producer responsibility system) for the management of the end of life of biodegradable and compostable plastic packaging certified in compliance with the standard EN 13432. It is the first European consortium for the organic recycling of bioplastic packaging and the seventh consortium of the CONAI system - which establishes the value of biological (organic) recycling and strengthens the Italian leadership in the circular bioeconomy sector. The task of the Consortium is to start recycling, in the recycling circuit of the organic fraction, of the packaging that at the end of its life is transformed, with specific industrial treatment, into energy in the form of biogas and into compost, a natural fertilizer that can return to the earth and revitalize the soil. Organic waste, which is collected separately from kitchens, today represents the most important flow of household waste collected separately, accounting for 40% of all separate collections in Italy.

CoReVe is the national consortium responsible for the recycling and recovery of glass packaging waste produced on the national territory. All glass packaging producers and importers, both bottlers and wholesalers, participate. The Consortium rationalizes, organizes, manages and promotes the recycling of glass packaging waste from national separate waste collection. The CoReVe in 2019 guaranteed the collection and recycling of the collected material thanks to the commitment of 96% of Italians. About 80% of bottles and jars consumed in Italy are produced by recycling the scrap from the separate collection of our glass. Municipalities, a real urban field.[5]

4.2 Italy – Central Adriatic Port Authority (Port of Ancona)

In addition to the above stakeholders identified in Italy, the main actors and authorities at local level for the Marche Region, are:

- Regional Agency for Environmental Protection Marche (ARPAM): The main functions attributed to ARPAs can be summarized as follows:
    - control of sources and factors of air, water, soil, acoustic and electromagnetic pollution;
    - monitoring of the different environmental components: climate, air, water quality, soil characterization, sound level of the environment;

[5] Source: https://www.conai.org/chi-siamo/sistema-conai/consorzi/

- control and supervision of compliance with current legislation and the requirements of the measures issued by the competent authorities in environmental matters;
- technical-scientific, instrumental and analytical support to the titular bodies with programming and administration functions active in the environmental field (Regions, Provinces and Municipalities);
- development of an environmental information system to support institutional bodies and available to the social organizations concerned.

- Port Authority: The Corps is the recipient of functions mainly related to the regulation of civil and productive uses of the sea, ports and coasts, as well as maritime transport in general. The attributions of a strictly military nature cover a substantially residual component linked to the concurrence activities in coastal defense and in supporting the action of the naval units of the Italian Navy. The staff of the Corps is vested with the qualification of officers and agents of the judicial police, for the violations provided for by the navigation code (article 1235) and other special laws (fishing, maritime state property, pleasure boating, environment, etc.).

  Briefly, the activities carried out can be summarized as follows:

  - search and rescue at sea (SAR);
  - navigation safety;
  - supervision of the operation of the port;
  - marine environment protection;
  - national control center for sea fishing;
  - training of maritime personnel;
  - registration of merchant, fishing and pleasure vessels;
  - litigation for maritime administrative violations;
  - maritime technical-administrative police including: the regulation of maritime activities (power of ordinance), control of maritime traffic, maneuvering of ships, inquiries on maritime accidents, management of ports not seat of the Port Authority;
  - testing and inspections of coastal deposits;
  - surveillance and maritime state police;
  - recruitment of Navy military personnel;
  - underwater archeology;
  - contribution to the fight against illegal immigration by sea;
  - civil protection services;
  - traffic police services in port areas (article 12, paragraph 3 letter f of the highway code);
  - anti-terrorism and security services, both in port areas and on board national and foreign ships, in compliance with current national and international legislation.

- Port chemist: is a professional figure provided for by the Navigation Code (Article 46 and following). The chemist of the port possesses an adequate knowledge of many professional topics, of the rules and regulations in force regarding naval and port safety, prevention of pollution at sea, degassing and remediation of tanks used for the transport of petroleum or chemical products, both in liquid and gaseous state, refrigerants and under pressure, etc. The port chemical consultants, for example, have the task of ascertaining the dangerous conditions of ships as regards the presence of explosive, flammable, poisonous, corrosive or otherwise harmful and dangerous vapors or gases, carrying out the checks with all technical means jointly to possible chemical processes.

- Municipality: local autonomous body that represents the community of the city itself and of the neighboring countries included in the municipality itself, taking care of the development and interests of the belonging fractions.

- Interested trade associations (shipowners, shipping agents, environmental operators).

- Area Territorial Assembly - ATO2 Ancona was established pursuant to the L.R. Brands n. 24/2009 and subsequent amendments, containing "Regional regulations on the integrated management of waste and remediation of polluting sites", following the approval and signing by the Municipalities of the Province of Ancona and by the Province itself of the "Convention for the unitary exercise of administrative functions regarding the organization of integrated management services of urban waste by the Area Territorial Assembly (ATA) of the Optimal Territorial Area ATO 2 - Ancona ".

  The constitution of the ATA is intended to ensure the integrated exercise of municipal functions regarding the management of urban and special waste similar to urban waste and in particular:

  a) the service governance unit in the Optimal Territorial Area of the Province of Ancona by separating the governance functions from those of service management;
  b) overcoming the fragmentation of management by entrusting the integrated waste management service at the Optimal Territorial Level;
  c) the management of the integrated waste management service within the Optimal Territorial Area according to criteria of efficiency, effectiveness, economy, transparency and environmental sustainability;
  d) the improvement, qualification and rationalization of services according to homogeneous levels and standards of quality and adequate to the needs of users;
  e) guaranteeing the protection of users and their participation in fundamental regulatory choices;

f) the guarantee of conditions and methods of access to services that are fair, non-discriminatory and responsive to the needs of the various categories of users;

g) the achievement of a uniform and balanced tariff regime for services within the Optimal Territorial Area;

h) the achievement of effective, efficient and economical integrated waste management, also through the signing of Agreements, Conventions and Agreements with public and private entities, identified in accordance with the law.

4.3 Greece – Igoumenitsa Port Authority

The following table presents key actors involved with waste management and port's environmental status.

Table 8 - Key actors involved with waste management and port's environmental status

Key Actors/ Stakeholders	Responsibilities/ Contributions
Ships	Waste Producer
	Responsible for providing adequate information to the authorities and operators of waste reception facilities about their waste and their storage capacity.
	Responsible to implement the waste management plan.
	Responsible for delivering their waste to organised port reception facilities.
Igoumenitsa Coast Guard	Responsible for the conformity control of the ships approaching the port area.
	Responsible for the control of the waste management procedures followed by the ships.
	Responsible to manage the information received from ships and to utilize the data for a variety of purposes.
External Technical Expert [HELLENIC ENVIRONMENTAL CENTER (HEC) S.A.]	Contractor responsible for the disposal of ship generated liquid waste.
External Technical Expert [ANTIPOLLUTION]	Contractor responsible for the collection and disposal of solid waste.
External Technical Expert [BIOLAB]	Contractor responsible for conducting seawater quality measurements.
Institutional Body [EUROCERT]	Responsible for IPA's Certification with ISO 14001
Institutional Body [Lloyd's Register]	Responsible for IPA's Approval to be certified with PERS
Institutional Body [Ministry of the Environment and Energy]	Responsible for IPA's Approval to be registered in EMAS

4.4 Croatia – Zadar County Rural Development Agency (Port of Zadar)

In Table, stakeholders are listed according to their importance in relation to their power of influence on the project and its results and based on their interest in the project ECOWAVES.

Table 9 - Stakeholder mapping

		Power of Influence	
		Low	**High**
Interest	**High**	**Marginal Stakeholders** **Importance = Low** • Local and national Media • General Public (Tourists, Visitors)	**Relevant Stakeholders** **(e.g. Institutions we would like to involve)** **Importance = Medium/ High** • Ministarstvo poljoprivrede/zaštite okoliša • City of Zadar • Zadar County • Zadar County Development Agency (ZADRA NOVA) • University of Zadar • Faculty of Maritime Studies in Rijeka • Ministry of Economy and Sustainable Development • Zadar branch of the Croatian Chamber of Economy

	Low	**Operative Stakeholders**
		(Stakeholders we must involve) Importance = Medium/High
		• Maritime police
		• Harbormaster`s office
		• Custom office
		• Luka Zadar d.d. - Cargo port concessionaire
			Key Stakeholders
			(Essential to project outcomes)
			Importance = High
			• Ministry of the Sea, Transport and Infrastructure
			• Liner Shipping companies
			  ○ Jadrolinija – liner shipping company
			  ○ Mia Tours - liner shipping company
			  ○ G&V Line - liner shipping company
			• Cruise companies
			• ZIPO d.o.o. Terminal building concessionaire of passenger port
			• Port agents
			• Concessionaires – waste removal
			  ○ Čistoća d.o.o. Zadar
			  ○ Cian d.o.o. Split
			  ○ IND-EKO d.o.o. Rijeka
			  ○ Dezinsekcija d.o.o. Rijeka
			  ○ Ciklon d.o.o. Zadar
			  ○ Sordes d.o.o. Zadar
			  ○ Odlagalište sirovina d.o.o. Zadar

4.5 Slovenia - RDA North Primorska d.o.o. (Port of Koper)

Luka Koper d.d. (the Port of Koper) is the only Slovenian multipurpose port. Its activity influences the development of the region, the Slovenian economy and logistics in this part of Europe. It comprises an integrated sea and coastal area where port activities related to cargo and passenger transport services take place. Luka Koper also has an important infrastructure, the Waste Management Center (WMC). The company **Luka Koper INPO**, wholly owned by Luka Koper, is responsible for the collection of ship-generated waste by providing the PRF's (port reception facilities).

The **Ministry of Infrastructure**, where **Slovenian Maritime Administration** operates, is the authority that approves the Tariff system for the collection of ship-generated waste. This approval can be a lengthy process that prevents prompt changes in waste management requirements and bids.

Luka Koper reports the annually collected ship waste to the **Ministry of the Environment and Spatial Planning.**

The implementation of Directive (EU) 2019/883 on port reception facilities for the delivery of ship-generated waste is also (!) dealt with by the Ministry of Environment and Spatial Planning, within which the Water and Investments Directorate operates, and not only by the Ministry of Infrastructure. This fact of "shared competences" has somehow inhibited the implementation of Directive 2019/883 in the Slovenian legal system. However, after pressure from the "civil society" on both ministries (as well as on the governmental institution for legal affairs), the first step towards the implementation of this directive was taken: the proposal for a relevant decree (on amendments and additions to the Regulation on Formalities in Maritime Notification) was published by the Ministry of Infrastructure on 20 May 2021. It is now (5 June 2021) in the public debate. After that, it should be published in the official Slovenian Gazette. The regulation states that it will enter into force on 28 June 2021 - the deadline for implementation in EU member states.

4.6 Serbia - Eco Zone Ada Huja

Key actors involeved in waste management in ports are:

- **Ministry of Construction, Transport and Infrastructure** - Sector for Water Transport and Navigation Safety within the framework of performing normative, study-analytical, administrative, administrative and professional tasks in the field of inland navigation and maritime affairs. Activities within the scope of the Sector for Water Transport and Navigation Safety are performed at the seat of the Ministry and in the regional units for the area of higher municipalities and for the area of cities - port authorities and their branches (Prahovo, Kladovo, Veliko Gradiste, Smederevo, Pancevo, Belgrade, Sremska Mitrovica, Titel, Senta, Novi Sad, Apatin, Bezdan);
- **Ministry of Envrionmental Protection -** Department for Waste Management;

- **The Port Management Agency** is a public agency established by the Government that performs strategic and administrative port management tasks and ports, regardless of their ownership status, ie regulatory, professional and development activities for the purpose of continuous and uninterrupted performance activities in the port area;
- **Operaters** who has permit for waste management in accordance with the Article 59 of Law on Waste management;
- **Port operators** - a legal entity operating one or more ports activities.

4.7 Albania – Port of Vlora

For waste management in the Port of Vlora area there is an involvement of a number of actors who play a key role in improving this activity. The main problem is related to the involvement of state institutions for the improvement of financial mechanisms for the creation of conditions at the port that meets all criteria for monitoring the environmental situation and waste management facilities. In terms of external navigation, in particular commercial ships have a good management of waste by the ships themselves, as their movement is international and the implementation of the Marpol Convention is an obligation in neighboring countries. Meanwhile, in terms of inland navigation as tourist boats going from the port towards the Karaburun Sazan National Marine Park, in the Bay of Vlora as well as private boats, there is poor waste management as a result of lack of control and support from institutions such as municipality and border police.

Table 10 - Key actors for management of waste in ports

Stakeholder Category	Relevant Stakeholders	Contribution on the Waste Management	
		Needs	Impact
Public Regional Authority	Vlore Municipality	Payment of anchoring and greening taxes from ships should be accompanied by facilities from the municipality	Involvement: Low Impact: Large
	Prefecture of Vlore	Must have support from the Prefecture for Facilities in Port for Waste Management	Involvement: Low Impact: Large
	Board police	Support during special events of emergencies	Involvement: Low Impact: Large
	Regional Administration of Protected Area	Continuous support in waste management plans	Involvement: Medium Impact: Large
Public National Authority	Albanian Institute of Transport	Contribute in Sustainable mobility plans. Contribution on developing sustainable management plans for waste	Involvement: Low Impact: Large

Stakeholder Category	Relevant Stakeholders	Contribution on the Waste Management	
		Needs	Impact
	Albanian Environment Protection Agency	Contribution on implementing the best practices of EU for the environmental protection in the port territory. Developing of guidelines for the water management, air pollution etc.	Involvement: Medium Impact: Large
	Ministry of Environment and Tourism	Contribute to improvelaws on waste management and differentiation of waste Contribute in adapting the national legislation.	Involvement: Large Impact: Large
	Ministry of Transport and Infrastructure	Safety Support to Port and Insurance Cases During Emergencies	Involvement: Low Impact: Large
Public Universities	Vlore University "Ismail Qemali"	Collaboration in developing training courses about environmental issues derived by the port operations.	Involvement: Low Impact: Medium
Private Sector	Delfini 1 Porti Durres Sh.a Duka sh.p.k	Subjects in charge for waste discharge management	Involvement: Large Impact: Large

4.8 Montenegro - Ministry of Capital Investment (Ports of Bar & Kotor)

As presented by the previous chapters, the main actors involved are the **operational users** of the Port of Bar as well as the **contracted waste operator for it**, which in the case of the port of Bar and for the majority of the country's major port and marinas is the company Hemosan" Ltd. Bar.

According to the company's public information and documentation, the applied ISO standards are the following:

- ISO 5001:2011
- ISO 9001:2015
- ISO 14001:2015
- OHSAS 18001:2007

The presentation of infrastructure and equipment regarding the waste management

for the country's ports and marinas is based on the provided information by the contracted waste operator, Hemosan" Ltd. Bar.

The company owns two Eco centers, one of which is in the Port of Bar and the other one in the Adriatic shipyard Bijela. The Eco center in the Port of Bar includes a recycling center for the acceptance, disposal and treatment of oily and wastewater (slop, bilge water, sludge) collected from the vessels.

The most important equipment contains of one vacuum truck (10 m3) and cistern (32 m3). The garbage from ships is collected on daily basis, and the average number of wastewater intakes on monthly basis is 5-10 times. All waste waters are subject of mechanical-chemical treatment in Hemosan's facility in Port of Bar.

5. SWOT Analysis

SWOT analysis is a strategic planning tool used to assess the Strengths, Weaknesses, Opportunities and Threats of a project or planning tool. The aforementioned analysis at each of the examined area/ ports, is typically represented through an illustrative diagram also known as a SWOT matrix.

5.1 Italy – Port Network Authority of the Ionian Sea (Port of Taranto)

The SWOT analysis performed by the Port Network Authority of the Ionian Sea of the following programming tools:

- Regulation for the regulation of the waste collection service from ships in the port of Taranto;
- Waste collection and management plan in the port of Taranto,

as presented in the tables below.

Table 11 - SWOT analysis of the Regulation for the regulation of the collection of waste from ships in the port of Taranto

Strengths	Weaknesses
• Effective regulation of the waste collection service from on board ships arriving in the port of Taranto, every day, including holidays; • Involvement of all bodies and stakeholders in port waste management; • Compliance with applicable regulations and the principles of accountability and cooperation of all stakeholders; • Guarantee of traceability of waste.	• Low refresh rate.
Opportunities	**Threats**
• Evaluate implementations of the waste collection and collection service from on board ships arriving in the Port of Taranto; • Redefining the regulatory model to integrate it into a uniform governance system of environmental services according to APEA standards6	• Failure to apply the Regulation could: ○ fail to ensure timely delivery of waste and residues, leading to unjustified delays and not guaranteeing safety standards for the environment and human health at the same time; ○ make it necessary to review service planning.

[6] The **ecologically equipped production area**, in the acronym APEA, is the result of an environmental policy which aims to reconcile the increasingly necessary economic development with respect for and protection of the environment. The APEAs were introduced in Italy in 1998 by the Bassanini Decree (Legislative Decree no. 112 of 31 March 1998).

Table 12 - Waste collection and management plan in the port of Taranto

Strengths	Weaknesses

• Presence on site of waste collection and management facilities:
  ○ Waste treatment at zero kilometers, resulting in a reduction in the daily transit of means of transport and reduction of atmospheric emissions;
  ○ Economic benefit.
• Efficient waste management: the management has not provoked disputes by the control authorities or reports of any disruption or discontent on the part of users who use the waste collection service even during the annual meetings held with the operators and administrations concerned.
• Compliance with local regulations and procedures adopted with the provisions of Legislative Decree 182/03: The Plan of the Port System Authority of the Ionian Sea is therefore a point of reference for a correct and effective waste management in the field port not only from a purely regulatory point of view but also of actual practice for the achievement of a high level of respect for the environment.
• Implementation of an ISO 14001: 2015 certified Environmental Management System
	• Failure to define specific objectives to be achieved and interventions and measures to be implemented to achieve the objectives;
	• Non-unitary management of waste management services.

Opportunities	**Threats**

• Awareness raising actions for the:
  ○ Encouragement of separate collection;
  ○ Minimising pollution of the sea by maritime waste;
  ○ Containment of ship-generated waste and cargo residues discharges into the sea.
• Evaluate plant implementations for better waste management;
• Evaluate incentive measures for those who reduce the amount of waste produced and who adopt good operating
	• The inefficient implementation of the Plan could lead to inefficient port waste management and poor environmental status in the port.

practices; • Setting targets for the reduction of waste produced by the Port Authority; • Set goals to increase recycling and reuse of materials; • Evaluate the possibility of including in the procedures for entrusting environmental services indications referring to the "Minimum Environmental Criteria" referred to in the National Action Plan for Green Purchases adopted with the Interministerial Decree of 11 April 2008 – updated with D.M. 10 April 2013 and in particular evaluate the possibility of using the instrument of excellence in the Field of Green Public Procurement (GPP): LCA (Life Cycle Assessment).	

5.2 Italy – Central Adriatic Port Authority (Port of Ancona)

In this specific paper, the discussion concerned the SWOT analysis of the plan for the collection and management of waste from ships and cargo residues from the Port of Ancona, prepared by the AdSP MAC and approved by the Regional Council Resolution of the Marche Region no. 1513 of 29 October 2012, and recently being updated to Revision no. 2 of 24 March 2021, soon to be approved.

Table 13 - SWOT analysis of the Regulation for the regulation of the collection of waste from ships in the port of Ancona

Strengths	Weaknesses
• Compliance with current regulations on the subject and with the principles of accountability and cooperation of all those involved; • Guarantee of traceability of the waste; • Definition of the legitimacy titles of the subjects who carry out waste management activities; • On-site presence of a plant for the collection and management (sterilization) of food waste: ○ 0 km waste treatment with consequent reduction of the daily transit of means of transport and reduction of atmospheric emissions;	• Regulatory and organizational lacuna relating to waste management procedures in the event of pandemic events. • Lack of facilities inside the port perimeter for the management of waste other than food waste.

○ Economic benefit. • Unified management of waste management services.	
Opportunities	**Threats**
• Evaluate implementations of the management (recovery / disposal) of waste from ships arriving in the Port of Ancona; • Adoption, in addition to the already defined legitimacy qualifications, of the evaluation methodology through Life cycle analysis of services; • Awareness raising actions for: • Encouragement of separate collection; • Minimal containment of sea pollution resulting from marine waste; • Containment of ship-generated waste and cargo residues discharges into the sea; • Evaluate incentive measures in favor of those who reduce the quantities of waste produced and who adopt good operating practices; • Redefinition of the regulatory model to integrate it into a unitary governance system of environmental services according to APEA standards2; • Implementation of an ISO 14001: 2015 certified Environmental • Management System.	• The delayed adoption of the new Plan could lead to an ineffective management of port waste and a poor condition of the port's environmental status.

5.3 Greece – Igoumenitsa Port Authority

In order to indicate the efficiency of the operation of the port of Igoumenitsa based on the current Port Regulation and Action Plan on Waste Management, a SWOT (Strengths Weaknesses-Opportunities-Threats) analysis is performed, which shows the Advantages - Disadvantages and Opportunities - Threats of their application to the port. This method will contribute to the grouping of the results, as well as to the drawing of conclusions for the formulation of proposals for the improvement of the existing regulation/ action plan.

SWOT analysis is a method of quality evaluation for decision making and may concern an institution, a company, a geographical area, etc. It provides the possibility of evaluating both the characteristics of the local environment, as well as the characteristics of the wider environment. The aim is to be effective and simultaneous strengthening the internal

dynamism of the organization or company, as well as the opportunities offered by the external environment, through efforts to eliminating or reducing internal weaknesses and address threats coming from the external environment.

A SWOT Analysis for the Port Regulation and the Action Plan on Waste Management is presented separately in the following tables.

Table 14 - SWOT Analysis of Port Regulation, Igoumenitsa Port Authority SA

Strengths	Weaknesses
• Very clear with well-defined contents. • Provides a detailed description of responsibilities of each organizational unit. This way, all involved parties (services/Directorates) have a clear image of what are the processes to be done and what are their responsibilities. • Complies with the national, European, and international legislation. • Identifies the organic jobs of OLIG S.A staff. • Determines the placement and evaluation of the Executives of OLIG S.A.	• Port Regulation is not recently updated: it has not taken into consideration the current needs of the port (last update: Decision No. 123/2018 – G.G 793/22.08.2018). • Apart from the internal organization and operation of OLIG S.A no reference to other issues/needs is made. • Although the Waste Collection and Waste Management Plan is in accordance with Directive 2000/59/EC and Directive 2007/71/EC and fulfils the legal requirements set by the Ministerial Decision 8111.1/41/2009, it does not take into consideration the most recent EU Directive 2019/883/EC (which has not been incorporated in the Greek legal framework until today).
Opportunities	**Threats**
• Around one third of the investments is related to the completion of LNG bunkering infrastructure. The IPA participates as Partner in the Poseidon Med II, implementing all the necessary actions for the adoption of the regulatory framework for the LNG bunkering, design and construct of LNG fueled specific feeder vessel, all necessary design for the port terminals and cooperation actions for promoting synergies among ports and gas providers.	• Technology: The adaptation to the rapid technological evolution and safety requirements related to ships bunkering, energy needs, passengers and logistics information exchange system, etc. could be a threat if the port is not complied fast (e.g. LNG bunkering, cold ironing, New Generation of Port Community System). • The rapid growth of shipping operations in the IPA (IPA is in the TEN-T core network/ Orient East Med corridor), increase the risks and the pressures to the ecosystem and the environment, requiring expanded facilities for waste storing and collection, new

	equipment, and more frequent monitoring operations.

Table 15 - SWOT Analysis of Action Plan on Waste Management, Igoumenitsa Port Authority

Strengths	Weaknesses
The current approach for waste management addresses all the environmental hazards identified by National and EU authorities (petroleum waste, hazardous and harmful substances, ozone depleting substances, sewerage, and trash). • Includes detailed methodologies for the quantitative assessment of waste and trash ejected by the ships. • Includes detailed descriptions of the type and capacity of the Igoumenitsa's port reception facilities. • Clearly presents the waste receipt and management procedures followed by the port. • Special reference to the environmental management system applied by the port. • Implementation of a fee charging system for the collection and management of liquid and solid waste and cargo residues of ships.	• Action Plan on Waste Management does not take into consideration the most recent EU Directive 2019/883/EC (which has not been incorporated in the Greek legal framework until today) (last update of the Action Plan: May 2017).
Opportunities	**Threats**
• Innovative Waste Management techniques /equipment can be used by the Port in order to improve the quality of the port's water. • EU resources available for port infrastructure development/ new waste management equipment which may increase storage capacity and make waste receipt and management procedures easier. • Continuous training to the personnel of the Port Authorities in terms of waste receipt and management procedures/ use of waste management equipment etc.	• Threats to the environment and the ecosystem due to likely gaps in the applied Waste Collection and Waste Management Plan, The current applied Plan by the IPA needs to be complied with the most recent EU Directive 2019/883/EC (which has not been incorporated in the Greek legal framework until today). The new directive aims to improve Port reception facilities, waste reception and handling plans, provides and advanced waste notification, improves the delivery of waste from ships, the inspections etc.

• Constant need for new collaborations with specialized external contractors in the management of ship-generated waste/ new companies with know-how and experience.	• Increased liquid and solid waste, attributed to the growing number of passengers, shipping operations in the port.

5.4 Croatia – Zadar County Rural Development Agency (Port of Zadar)

Besides SWOT Analysis of the concerned Port Regulations and Action Plan on Waste Management in this report will be included also General SWOT Analysis of Zadar Port.

In order to better justify the actions, it is important to provide more details on these points from the SWOT analysis performed, with the objective focus on few specific statements of the SWOT analysis.

Analyzed SWOT statements:

Threats:

Environmental status of the examined port is in that bad condition that needs stricter Action Planning to tackle the identified issues:

- No Action Plan on Waste Management
- Lack of training personnel in charge for waste management
- Lack of specialised equipment and facilities for monitoring and cleaning of environmental hazards / waste
- Lack of cooperation between key stakeholders

Weakness:

- Increased interest for cruise industry causes more emissions/waste and highlights the need for finding solutions to tackle this environmental dimension
- Increased number of passengers and vehicles in international and domestic ferry traffic in the port of Gazenica couses more waste in this port area

Threats

This research shows that there is a lot of room for improvement - primarily with waste management in the port, but also at the destination. Perhaps the biggest threat lies in the fact that the destination is not yet ready for a more serious and sustainable reception of waste from ships, but these issues go beyond the competence of the entities in the ECOWAVES project and are the subject of a wider discussion.

Furthermore, the Port has all the national documents and procedures for waste disposal, however, and the under capacity of staff within the Zadar Port Authority as well as other key entities causes weaker monitoring of these processes. One of the observed shortcomings is the absence of a long-term waste management plan in the port as a significant part of the future environmental protection plan of the Port of Zadar.

Since it is a very frequent port with a large number of passengers and vehicles, in addition to managing the removal of waste from ships, it is necessary to pay special attention to maintaining the mainland in such a way as to ensure quality and separate reception of small municipal waste produced by passengers. Waste recycling and the postulates of the circular economy currently exist only in traces and are outside the port area. The circular economy is a system built on reduction, reuse and recycling because waste is considered a valuable resource. In the light of these conclusions, the installation of ¨ECO ISLANDS¨ on the mainland part of the port area intended for all port users should be considered.

We should also mention the lack of concrete destination cooperation and initiatives such as the initiative launched by the City of Dubrovnik "Respect the City" which through all stakeholders and through periodic action plans proposes measures that affect further sustainability of the destination and awareness of both residents and visitors / tourists. Although this is an initiative launched by the City of Dubrovnik and not the Port Authority, this example is an excellent example of cooperation between key actors in environmental management, waste management and promoting the sustainability of the destination.

In any case, we can conclude that in terms of sustainable development of Zadar as a destination and the Zadar Port Authority has made huge positive strides in the previous period and thus solved much of the problem in sustainable destination management. It is time to eliminate minor shortcomings and long-term strategic thinking in the direction of developing activities and procedures in waste management.

Weaknesses

The growth of cruise tourism has resulted in an increasing concern for the environmental impact that this type of tourism may cause. Awareness of the marine and environmental pollution caused by cruise ships is a great issue for all Adriatic cities, and it has increased in the last years since the number of cruise calls has drastically increased. Adriatic Sea attracts numerous cruisers in its semi-enclosed area within the Mediterranean and Zadar has in the last years proved to be a very attractive tourist destination especially since the opening of the New Port of Gazenica in 2015 with a temporary terminal building and even more since 2018 when the New Port of Gazenica was in full operation.

Figure 43 – View of the Port

In 2019, Zadar was ranked as a third cruising destination in the Republic of Croatia after Dubrovnik and Split and it was chosen as the world's best port at the Sea trade Cruise Awards 2019 with a tendency to increase the traffic in the following years prior to the breakout of the COVID-19 pandemic. Since 2012 to 2019, the number of cruise passengers has increased from 20.958 passengers to 182.682 passengers (Figure 44). The predictions are that the cruise traffic will continue with its increase after the normalization of the situation with the pandemic. Better facilities, new routes and even bigger ships support the increase of traffic in the cruise industry which is a benefit also to the economic growth but also a disadvantage to the environmental sustainability as cruise ships are well known marine pollutants.

Figure 44 - Port of Zadar - Passengers on cruisers from 2012 to 2019
Source: based on the data from the Port of Zadar Authority

One of the main challenges in the years to come will be developing cruise industry in line with sustainable principles by preserving natural habitat and port cities. This will have to be enhanced in parallel with development and implementation of technological advances in port areas. Therefore, it is necessary to tackle the issue of increasing cruise traffic in the port of

Zadar which consequently causes an increase in the emissions and potential pollution in the port and port-city area. It is necessary to consider environmentally friendly and sustainable solutions in order to create a better environment for tourist and local residents.

Table 16 - SWOT Analysis of Port Regulation, Port of Zadar

Strengths	Weaknesses
• Port Regulation is very clear: All involved parties have a clear image of what are the processes to be done.	• Port Regulation is recently updated but it has not fully taken into consideration the current needs of the port.
Opportunities	**Threats**
• Focus on energy efficient and sustainable waste management solutions for maritime transport and port operations. • Usage of EU funds in financing activities for improving waste management solutions. • Existing policies and strategies support environmentally efficient and safe maritime transport which is in line with project objectives of energy efficient and sustainable technologies in ports and maritime transport in general (Transport Development Strategy of the Republic of Croatia 2017-2030, Maritime Development and Integrated Maritime Policy Strategy of the Republic of Croatia 2014-2020, National Policy Framework on Alternative Fuels).	• Technology: Progress in technology are very fast to be timely integrated in the Port Regulation of our Port (e.g. LNG bunkering). • Training: National Authorities are not enforcing training's to the personnel of the Port Authorities in terms of Organization and waste management.

Table 17 - SWOT Analysis of Action Plan on Waste Management, Port of Zadar

Strengths	Weaknesses
• The current approach for waste management monitoring and address all the environmental hazards identified by National and EU authorities.	• No Action Plan on Waste Management • Non-existing long-term strategic environmental plan • Lack of personnel in charge for waste management

	• Lack of training personnel, lead to inefficient implementation of the Action Plan provisions for waste management. • Lack of specialised equipment and facilities for monitoring and cleaning of environmental hazards / waste.
Opportunities	**Threats**
• Innovative Waste Management techniques /equipment can be used by the Port in order to improve the quality of the water and air. • Focus on energy efficient and sustainable waste management solutions for maritime transport and port operations. • Usage of EU funds in financing activities for improving waste management solutions. • Raising awareness and promoting maritime transport is one of the key goals to be used for also promoting waste management best practices.	• Environmental status of the examined port is in that bad condition that needs stricter Action Planning to tackle the identified issues: • No Action Plan on Waste Management • Lack of personnel in charge for waste management • Lack of training personnel, lead to inefficient implementation of the Action Plan provisions for waste management. • Lack of specialised equipment and facilities for monitoring and cleaning of environmental hazards/ waste.

Table 18 - SWOT Analysis of Port of Zadar

Strengths	**Weaknesses**
• Strong maritime heritage. • Strongly developed tourist industry. • The new Gazenica-Zadar cruise port was chosen as the world's best port at the Seatrade Cruise Awards 2019. This should be exploited in terms of investing into energy efficiency as well. • Wide range of maritime activities and services support the implementation of energy efficient technologies. • Geostrategic position of the port in the center of the Adriatic Sea and the Mediterranean.	• Port performance is closely related and dependent on the tourist industry and passenger traffic which is strongly affected by the COVID-19 pandemic. • Non-existing long-term strategic environmental plan. • Weak and unreliable intermodal connections which are recognized as environmentally more acceptable mode of transport. • Inexistent system for the monitoring of port environmental impact. • Electric car and sufficient EV charging stations are not available within the port area.

• Availability of other services such as airport, banks, tourist offer, and sights are an additional benefit to the port operations and services. • Rising trend of passenger and cruise ship travels supports the need for implementing energy efficient technologies. • Potential to develop industry of super yachts and related activities supports the need for investing into energy efficient technologies. • Existing road, rail, air connections which support port operations. • New Port of Gazenica is dislocated from the city center in order to preserve the old town and local inhabitants from emissions and potential pollution. • Terminal building uses LED lighting. • Water for green areas within the port will be collected through the PV surfaces as a result of the SUSPORT pilot activity. This will result in water savings which will be estimated after the implementation. • Purchase of electric vehicle together with a charger supports project activities as implementation of e-mobility is one of key project deliverables and objectives. • Environmental protection contributes to economic growth which has been hindered by the COVID-19 pandemic. • Action plan will be developed within the project SUSPORT and will be used as an added value to the energy efficiency and sustainability within the port. • Annual Plan of the Port of Zadar Authority for 2021 states that supporting energy efficiency and potential installation of alternative energy stations for ships and vehicles will be explored. Usage of more environmentally friendly fuels, like LNG, can decrease emissions from ships up to 30% and SOx emission up to 100%.	• Port outdoor lightning is currently using traditional metal halide lamps which use about 25%-80% more energy than modern LED street lamps and last from 3-25 times shorter than energy-efficient lightbulbs. • There is no water collection system for watering green areas which results in usage of fresh water for this purpose. • Rising trend of passenger and cruise ship travels will cause an increase in the greenhouse gas emissions which highlights the need for the harmonization of policies and actions to strengthen environmental sustainability and port energy efficiency at cross-border level. • Low interest from stakeholders for the implementation of project pilot activity and new technologies.

Opportunities	**Threats**
• Increased interest for cruise industry supports economic growth. Furthermore, economic growth caused by improved technologies can enable better outputs with less pollution. • Cruise industry worldwide is directly affected by the COVID-19 pandemic which causes a decrease in the cruise traffic and as a short-term consequence affects positively environmental dimension. • Construction and modernization of rail infrastructure would contribute to modal shift from road to rail and would result in reduced usage of more polluting road vehicles. • Focus on energy efficient and sustainable solutions for maritime transport and port operations. • Usage of EU funds in financing activities and energy efficient solutions. • Raising awareness and promoting maritime transport is one of the key goals to be used for also promoting energy efficiency. • Improving the accessibility of maritime passenger transport services will result in an increase in the maritime passenger transport usage but will reduce the usage of cars and will support new activities in the scope of energy efficiency and sustainability. • Development and implementation of modern technologies and energy efficiency is one of the key goals in the future development of the port which is in line with project objectives. • Investing in the employee education and regular trainings can also result in reduced emission volumes. Some studies have confirmed that the way of manoeuvring the ship may influence the emission volume up to 15%–18%. • Existing policies and strategies support environmentally efficient and safe maritime	• Increased interest for cruise industry causes more emissions and highlights the need for finding solutions to tackle this environmental dimension. • Cruise industry worldwide is directly affected by the COVID-19 pandemic which causes changes in the market demand and consequently negatively influences the quality of life and economic sustainability which affects negatively energy efficient and sustainable development of ports. • Economic instability causes some stakeholders and concessionaires to focus more on their business models and optimization rather than investing in energy efficient technologies. • Dependency on tourist traffic and cruise passengers causes additional congestions and pollution. • Business environment and culture supports road transport over maritime transport which results in additional emissions. • Increase in maritime and coastal activities also causes a higher risk for negative environmental impact.

transport which is in line with project objectives of energy efficient and sustainable technologies in ports and maritime transport in general (Transport Development Strategy of the Republic of Croatia 2017-2030, Maritime Development and Integrated Maritime Policy Strategy of the Republic of Croatia 2014-2020, National Policy Framework on Alternative Fuels).	

5.5 Slovenia - RDA North Primorska d.o.o. (Port of Koper)

The tables below provide an overview of the identified strengths, weaknesses, opportunities and threats of the examined documents.

Table 19 - SWOT Analysis of Port Regulation in the Port of Koper

Strengths	Weaknesses
• Luka Koper provides the mandatory national non-profit service of collecting solid and liquid waste from ships in the port area. The company Luka Koper INPO (wholly owned by Luka Koper) is in charge for the collection of ship waste by providing the PRF's (port reception facilities). This synergy facilitates the system of ship waste disposal.	• The tariff system has to be approved by the government, which is a lengthy process in Slovenia.
Opportunities	**Threats**
• There is continuous cooperation between the Regional Civil Protection Authority in Slovenia and the Port of Koper, which is reflected in regular updating of fire safety equipment and regular fire safety training. • Fire protection modernization has begun in the center, which covers an area of 12,700 m2, and construction will be completed in 2021.	• In Slovenia, there is a lack of infrastructure facilities for recycling waste and the cost of treating waste in other (EU and non-EU (Asian)) countries can increase significantly. In this case, these costs may pose a serious threat to the reduction of shipping.

Table 20 - SWOT Analysis of Action Plan on Waste Management in the Port of Koper

Strengths	Weaknesses
• The adopted system of ship-waste treatment achieves 91 % of separate collection of waste. The target of action plan is to achieve 100% of separately collected waste by the year 2025.	• The equipment and infrastructures for the collection, treatment and temporary storage of ship-generated waste are to be compensated by the shipping companies through the tariff system. However, shipping companies are naturally reluctant to pay more for waste treatment, and these costs may also determine which port the ship calls at or at which port the ship's waste is to be 'delivered'. Therefore, the economics of handling ship-generated waste are weak, not stable and susceptible to fluctuations in tariffs in other ports. • Slovenia, as a country of two million inhabitants, has limited capacity to deal with waste and cannot introduce a circular economy for most waste.
Opportunities	**Threats**
• Regional agreement(s) between the ports of the area Adriatic-Ionian on the joint plan for ship-generated waste. • Regional agreement(s) on tariffs for charging for public services related to ship-generated waste management.	• Slovenia has not yet implemented DIRECTIVE (EU) 2019/883 on Port reception facilities for the delivery of ship-generated waste. However, according to the latest information (20 May 2021) from the Department of Water and Investment Directorate of the Ministry of Environment and Spatial Planning, this implementation may take place by the deadline for implementation (28 June 2021). Nevertheless, this poses a threat to the management of ship-generated waste, at least in 2021, as the EU Directive regulates the collection and treatment of ship-generated waste. • The lack of regional training programmes that would help to harmonise the treatment of ship-generated waste in the Adriatic-Ionian area certainly poses a threat. Ships should face a common treatment of ship-generated waste in the Adriatic-Ionian basin.

5.6 Serbia - Eco Zone Ada Huja

Table 21 - SWOT Analysis of Port Regulation, Eco Zone Ada Huja

Strengths	Weaknesses
• Law on navigation and ports on inland waters defines ship waste management: ○ obligatory keeping of ship waste log and its reporting to the Harbor Master's Office; ○ prohibition of discharging, spilling or discharging into inland waters of harmful objects or substances (oil, oil derivatives, cargo parts or cargo waste from vessels) ○ It is forbidden to burn garbage, sludge, sludge and special waste on the vessel. ○ It is prohibited to discharge wastewater from: 1) vessels intended for the transport of passengers with more than 50 cabins; 2) passenger vessels, intended for the transport of more than 50 passengers. ○ The master of the vessel is obliged to hand over harmful objects and substances to the receiving stations. ○ Garbage from the vessel is collected and, when possible after the classification of recyclable materials, handed over to receiving stations, ie facilities for the treatment of non-hazardous waste. ○ Harmful items and substances are collected from the vessel, stored and handed over for treatment to a waste treatment plant under the conditions prescribed by the law governing waste management.	• Law on navigation and ports on inland waters includes procedures, equipment and facilities that are not established or built in Serbian ports. • Law on navigation and ports on inland waters is not fully compliant with environmental laws (described in the chapter above).

Opportunities	Threats
• If the legal regulations and construction of the plant are harmonized, it will be possible to establish a Waste Management System in accordance with national and EU laws (Law and regulations in the field of waste management are harmonized with EU legislation).	• If the legislation is not harmonized with the regulations on environmental protection and waste management, the developed projects are not implemented, the system will not be established and the deterioration of the quality of the environment will continue. • Possibility of non-realization of planned projects due to lack of financial resources.

Table 22 - SWOT Analysis of Action Plan on Waste Management, , Eco Zone Ada Huja

Strengths	Weaknesses
• Action Plan on Waste Management is very up to date: it has integrated recent findings so that they can be more easily tackled. • The current approach for waste management monitoring and address all the environmental hazards identified by National and EU authorities. • Action Plan includes all ports in Serbia • Action Plan is drafted in accordance with good practice in waste management and waste principes. • Reduced amounts of waste, • Reduced negative impact on the environment. • Employment of personnel in charge of waste management.	• Lack of infrastructure for waste collection and storage until delivery to the operator • Lack of organized waste collection in ports • Lack of precise data on the amount of waste generated (it is possible to oversize or downsize containers and equipment) • Lack of training personnel, lead to inefficient implementation of the Action Plan provisions for waste management. • Lack of specialised equipment and facilities for monitoring and cleaning of environmental hazards / waste. • Poor waste management in whole country, especially with hazardous waste management which is exported and not treated in the county.

Opportunities	Threats
• A feasibility study for the construction of a terminal for waste materials from vessels in the area of Belgrade has been prepared and can be applied. • Projects have been developed for the construction of a terminal for waste materials (including wastewater) in all ports.	• Environmental status of the examined port is in that bad condition that needs more realistic Action Planning to tackle the identified issues. • Lack of financial channels. • Lack of trainings schemes. • Ambitious Action plan which cannot be implemented in total.

5.7 Albania – Port of Vlora

Table 23 - SWOT Analysis, Port of Vlora

Strengths	Weaknesses
• Implementation of a proper plan for emergencies for marine pollution. • Synergies with other Projects relevant to the Action Plan • Database on traffic flow and waste generation of ships	• Lack of information of the port administration staff regarding the importance of air quality and the importance of a clean environment. • Lack of Inter-Institutional Cooperation for Waste Management. • Lack of an Environmental Laboratory for monitoring of the quality of sea water, the quality of air within the port area and the noise level. • Lack of information regarding monitoring of water quality from the port administrate staff (environmental sector). • Lack of facilities for waste collection in port premises. • Lack of financial capacity to support the port on waste management.
Opportunities	**Threats**
• EU support for waste management. • Government renewed focus on a clean environment.	• Lack of investment in the environmental sector of the port. • Lack of political support with relevant policies and infrastructure investments,

• Availability of relevant information from previous projects of Vlore Port Authority, Institute of Transport, Regional Administration of Protected Areas, Vlore University, NGOs. • Collaborate with the local authorities and other stakeholders resources to improve environmental services. • Changing the position and structure of the port with the fulfilment of all parameters and conditions (new facilities for waste management within the port and the establishment of a proper laboratory).	especially in sustainable use of natural resources and in the implementation of convention for dangerous waste management. • Regional and National elections, followed by the changes of some of the directors in key authorities agencies. • Difficulty to implement all relevant policies since most of the port terminals are private. There may be disagreement between the parties. • Failure to comply with one of the principles of sustainable development ¨Polluter pays¨. • The traffic flow affects the Marine Protected Area of Karaburun-Sazan.

Strengths

Implementation of a proper plan for emergencies for marine pollution- Regarding the waste management plan in general, there is no proper written and implemented plan. The only management plan is the one of marine pollution emergencies, which brings a cooperation between different institutions responsible for special situations.

Database on traffic flow and waste generation of ships - The Port of Vlora and the Captaincy have created a database related to maritime traffic, ships entering and leaving the Bay of Vlora and the types of waste they generate, their amount and continuously check the relevant ship reports related to the internal management of waste, according to the Marpol Convention.

Weaknesses

Lack of an Environmental Laboratory for monitoring of the quality of sea water, the quality of air within the port area and the noise level → Lack of information of the port administration staff regarding the importance of air quality and the importance of a clean environment- The lack of a port laboratory for water quality monitoring and other environmental factors leads to a lack of data on the timely change of the ecological status of inland port waters by external impacts and to take the necessary measures. The lack of a proper environmental sector in the port department further emphasizes the lack of attention to the importance of keeping the aquatic environment as clean and unaffected as possible. There is no institutional staff that can monitor the quality of marine waters.

Lack of facilities for waste collection in port premises- In the port facilities there is a lack of waste differentiation bins and a waste collection point from different vessels (internal or external). Solid waste is the only one that is collected by a certain contracted company which due to a low payment, does not ensure their collection on a regular basis.

Lack of financial capacity to support the port on waste management- The Port of Vlora has had a significant lack of financial resources in terms of further development of waste management and water quality monitoring. This comes as a result as the port itself, in recent years, does not have direct access to port investments.

Opportunities

Changing the position and structure of the port with the fulfillment of all parameters and conditions – Strategic investments have recently affected the Port of Vlora, whose structure will be moved to a more suitable place and with the new modern conditions they will have the construction of an internal laboratory for monitoring the environmental status and staff dedicated to cases of environmental protection from various impacts that may come from high ship traffic.

Threats

Lack of political support with relevant policies and infrastructure investments, especially in sustainable use of natural resources and in the implementation of convention for dangerous waste management- Although Albania is a party to a series of international agreements on waste management of various categories in marine environments and a proper legislation, waste management remains one of the main issues untouched not only in the marine environment but also in cities. Waste differentiation is not yet implemented in Albania and waste treatment is still in its initial stages, which has had a major impact on the surrounding environment. The lack of funding in this sector has led to a shift away from the attention of waste management which comes from the numerous ships in the respective ports.

Failure to comply with one of the principles of sustainable development "Polluter pays"-The "Polluter Pays" principle aims to prevent pollution and take controlling measures, but also to cover obligations from responsibilities, e.g. costs of recovering damage to the environment. Continuous control by the relevant institutions over the entities that cause pollution remains at undesirable levels, therefore so far, there is no case of application of this principle of sustainable development on ships and the impacts they bring to the marine environment.

The traffic flow affects the Marine Protected Area of Karaburun-Sazan- The Karaburun Sazan marine protected area is located in the Bay of Vlora and is heavily influenced by ship traffic. A series of tourist and private boats departing from the Port of Vlora visit this area and as a result of poor waste management from the port and the lack of support from the municipality in collecting the waste they generate, makes a part of this ships to return with less waste, leaving them in the Karabuun Peninsula. In the case of private boats, the control of which was recently removed from the competences of the border police, this problem is even more highlighted. All these wastes directly affect the landscape appearance of the protected area and the biodiversity that has.

5.8 Montenegro - Ministry of Capital Investment (Ports of Bar & Kotor)

Table 24 - SWOT Analysis of Port Regulation, Port of Bar

Strengths	Weaknesses
• Main Montenegrin International Port: The Port of Bar is according to the national legislation the country's main exporting and importing port, and as such it is the prime target for any regulatory improvements. • Applied Regulation is directly linked to the National Legislation: This means that any updates linked to International Agreements and EU Legislation can easily be transferred on the regulatory level of the Port.	• Inflexible structure of Regulation: The strong link to national legislation means that the regulation is difficult to adjust at port level. • Complicated Relationship and Operation within the Port Activities: The port operators have overlapping activities, especially in the case of the Free Zone Operation.
Opportunities	**Threats**
• The introduction of newer and more effective EU legislation can have a direct impact on the Port Regulation. • Development of new services and products: New provided services linked to environmental performance of the Port, increasing its regional competitiveness. • Institutional developments in broader EU concepts (Motorways of the Sea): The port's geographical Location can promote its status as potential short sea shipping hub and emphasize its role as an alternative to other regional land transport corridors.	• Technology and Infrastructure Needs: Advancements in maritime technology that create additional requirements, not able to be timely integrated in national legislation. • Institutional Developments: As in the case of technology, the rapid advancement of institutional regulation that can affect operational requirements of the port.

Table 25 - SWOT Analysis of Action Plan on Waste Management, Port of Bar

Strengths	Weaknesses
• The Waste Management Plan has been direct result of EU requirements and is under periodical review to meet them, in terms of management monitoring and environmental hazards. • The Waste Management Plan is linked directly to the applicable Waste Management Legislation and has been specially designed for the Port of Bar. In addition, the Waste Management Plan is detailed in its content and explaining the roles of the managing authority and any contractors responsible for the implementation of the Plan.	• The Port of Bar does not have specialized equipment for the management of waste, and especially in the case of vessel related waste and pollution. • Lack of specialized Personnel on Waste Management. • No implemented training activities for Port of Bar Personnel. • Lack of Coordination with of other Regional Partners.
Opportunities	**Threats**
• Overall improvement of Waste Management in Montenegro (increase of recycling rates, reduction of waste quantity headed in landfills). • Overall improvement of Waste Infrastructure in the country via the Implementation of development projects.	• All activities are conducted by the authorized external contractor. • Changing conditions / needs in waste management: An unexpected increase in waste volume especially in waste types not easily managed (hazardous, chemical). • Continuation of present Waste Management Situation in the county and Lack of investments on the waste management sector.

6. Suggestions/ Conclusions

Following the SWOT Analysis performed by each of the ECOWAVES partners, on the available port regulations of the examined areas, conclusions and suggestions are presented hereby, with an "overall" approach, on project level, at first, and a more detailed "individual" approach afterwards.

So, taking into account the analyses above, a series of conclusions of the examined ADRION area, are the following:

- Most partners apply regulations in alignment with the EU requirements, No Action Plan on waste management in some cases, or delays into the adoption of EU Directives or compliance to environmental laws.
- Implementation of waste collection processes.
- Low refresh/ update level of port regulations for waste management.
- Availability of facilities and processes for waste management.
- More general regulations are applied to each of the ports.
- Availability of experts in the field.
- Need for more active/ specialized personnel and equipment.
- Involvement of many actors to the waste management.

According to the conclusions drawn above, a series of suggestions are:

- More efficient implementation of waste management plans and regulations.
- Update of port regulations, considering the current needs of each port.
- Implementation of new waste management measures and techniques.
- Focus on recycling/ reuse of materials and chances provided by technological progress.
- Intense training of staff in waste management plans implementation.
- Adequate facilities and equipment for the proper waste management.
- Higher participation of stakeholders in waste management/ Raise of awareness.
- Exploitation of funding opportunities to upgrade existing infrastructure and waste management.
- Exchange of good practices.
- Innovative approaches adoption.
- Intense monitoring of regulations implementation.
- Higher organization of waste collection; need to focus on the hazardous waste collection methods.

The above derive from each of the SWOT Analyses conducted under this joint deliverable of ECOWAVES project partners, whose detailed suggestions and conclusions **are separately presented and further analyzed below, tailored to the specific area/ port, as expressed by each one of the partners.**

6.1 Italy – Port Network Authority of the Ionian Sea (Port of Taranto)

From the examination through the SWOT analysis tool of the programming tools used by the Port System Authority of the Ionian Sea, for what concerns the management of waste in the port area (Regulation for the regulation of the waste collection service from on board the ships in the port of Taranto and the waste collection and management plan of the Port of Taranto), the following emerged:

1. The programmatic and operational tools analyzed are compliant with the mandatory sector regulations;
2. The application of plans and regulations makes waste management in the port area efficient and ensures the necessary traceability of waste. In particular, the Authority did not receive, in the period analyzed, reports of any services or discontent from users who use the waste collection service or complaints from the control bodies;
3. The management of waste in the port of Taranto appears to be virtuous thanks to the availability of existing collection and management facilities within or near the port area as well as the planning of interventions and actions, in the short and long term, aimed at identify and initiate remediation solutions regarding port services to be brought to the attention of the appropriate institutional work tables aimed at increasing the competitiveness of the Port of Taranto;
4. The development of an articulated environmental monitoring program on the matrices (water, air, flora and fauna, acoustic climate, soil, vegetation, sediments, benthos) has been prepared and is being entrusted, elaborated by DICATECh (Department of Civil, Environmental Engineering , of the Territory, Construction and Chemistry) of the Polytechnic of Bari.

In addition to the strengths that emerged from the evaluation of the aforementioned tools, it is possible to determine some weaknesses and threats, including:

1. Need to implement plant structures for better waste management;
2. Failure to define specific objectives to be achieved and interventions and measures to be implemented to achieve them;
3. The inefficient application of plans and regulations would lead to certain disservices and / or discontent on the part of users who use the waste collection services. This would lead to consequent inefficient management and poor environmental conditions of the port.

Finally, the application of the SWOT analysis led to the determination of the following opportunities:

1. Evaluate the possibility of improving the waste collection and collection service from ships arriving in the Port of Taranto;
2. Evaluate the implementation of plant structures for better waste management;

3. Evaluate incentive measures in favor of those who reduce the quantities of waste produced and who adopt good operating practices;
4. Establish objectives for the reduction of waste produced by the Port Authority;
5. Set goals to increase the recycling and reuse of materials;
6. Evaluate the possibility of including in the procedures for awarding environmental services indications referable to the "Minimum Environmental Criteria" referred to in the National Action Plan for Green Purchases adopted with the Interministerial Decree of 11 April 2008 - updated with Ministerial Decree April 10, 2013 introducing the possibility of using the tool of excellence in the GPP field: LCA (Life Cycle Assessment);
7. Evaluate the transformation of the port area into a Landscape and Ecologically Equipped Production Area (APPEA). This instrument of unitary governance of environmental problems appears as an effective means of monitoring the state of the port ecosystem in all its matrices, to face and overcome contingent and / or structural obstacles more easily in the application of the certified Environmental Management System, to monitor the correct application of procedures and timely compliance with environmental protection regulations by all operators within the Port.

6.2 Italy – Central Adriatic Port Authority (Port of Ancona)

From the examination through SWOT analysis of the programming tools used by the Central Adriatic Ports Authority, for what concerns the management of waste in the port area (Plan for the collection and management of waste from ships and residues of the cargo of the Port of Ancona), the following emerged:

1. The programmatic and operational tools, in place or in the process of being adopted, analyzed comply with the mandatory sector regulations;
2. The application of the aforementioned tools makes waste management in the port area efficient and ensures the necessary traceability of waste;
3. The definition of legitimacy titles for those who apply to carry out waste management activities is relevant to the environmental sustainability objectives set by the AdSP MAC;
4. The presence on site of a plant for the collection and management (sterilization) of waste allows the treatment of waste at km 0 with consequent reduction of the potential diffusion in the environment of pollutants and the reduction of the daily transit of means of transport with consequent reduction of atmospheric emissions, as well as a significant economic benefit.
5. The unitary management of waste collection and management services can be considered a strength with reference to overcoming the fragmentation of management and the principle of territorial self-sufficiency and proximity.

In addition to the strengths that emerged from the evaluation of the aforementioned tools, it is possible to determine some weaknesses and threats, including:

1) Need to implement plant structures for better waste management, especially with regard to waste other than food waste;
2) The regulatory and organizational gap relating to waste management procedures in the event of pandemic events;
3) The delayed adoption of the Plan could lead to disservices and/or discontent on the part of the users who use the waste collection services. This could lead to consequent inefficient management and poor environmental conditions of the port.

Finally, the application of the SWOT analysis led to the determination of the following opportunities:

1) Evaluate the implementation of plant structures for better waste management;
2) Evaluate incentive measures in favor of those who reduce the quantities of waste produced and who adopt good operating practices;
3) Evaluate the possibility of including in the procedures for awarding environmental services indications relating to the "Minimum Environmental Criteria" referred to in the National Action Plan for Green Purchases adopted with the Interministerial Decree of 11 April 2008 - updated with Ministerial Decree April 10, 2013 introducing the possibility of using the tool of excellence in the GPP field: LCA (Life Cycle Assessment);
4) Evaluate the transformation of the port area into an Ecologically Equipped Production Area (APEA). This instrument of unitary governance of environmental problems appears as an effective means of monitoring the state of the port ecosystem in all its matrices, to face and overcome contingent and/or structural obstacles more easily in the application of the certified Environmental Management System, to monitor the correct application of procedures and timely compliance with environmental protection regulations by all operators within the Port.

6.3 Greece – Igoumenitsa Port Authority

In conclusion, the Waste Management Plan implemented by the port of Igoumenitsa is a useful tool for stakeholders as it fulfills the requirements for ship waste collection and management plans, in accordance with Article 5 and Annex I to THE MAIN MINISTERIAL DECISION 8111.1/41/09 (Government Gazette 412 B). However, based on the above analysis, the Plan should be updated considering the identified threats and opportunities. The identification of the weaknesses in the content of the plan will help the competent authorities to draw up a new plan that takes these weaknesses into account and aligns them with port legislation and regulations. Based on the results derived from the available data and the previous reports elaborated in the context of WP1 T1, regarding the status of the port, it is obvious that greater efforts for its improvement should be made.

Similarly, the Port Regulation should be updated considering the latest needs of the port as well as the weaknesses identified in the abovementioned analysis. It is a fact that the current Port Regulation does not consider other issues apart from the internal organization of the

Directories and Services of Igoumenitsa Port Authority. For that reason, a more updated regulation should be drafted.

6.4 Croatia – Zadar County Rural Development Agency (Port of Zadar)

The yellow marked area shown on figure 45 is the scope of investigation in this document.

As estimated, the number of cruisers will increase especially due to the fact that port of Zadar may develop as a home port. Therefore, Port Authority is engaged in finding a way to establish properly infrastructure in correlation with this growth.

Figure 45 - Passenger area in the port Gazenica (marked with yellow border)

The Transport Development Strategy of the Republic of Croatia defines the need to relieve the Passenger Port of Zadar and move ferry traffic from the city center (peninsula) to the new Passenger Port of Gaženica. The strategy envisages the construction of a new ferry terminal as a priority investment. The advantages of the Port of Gaženica are the short distance from the city center (3.5 kilometers), the proximity of the airport (10 kilometers), the railway and quality transport connections with the A1 Motorway and the network of other EU motorways. The Port of Gaženica meets multiple traffic requirements - island, coastal, international ferry traffic, passenger traffic on mega cruisers and cruisers and RO-RO traffic, with all the necessary infrastructure and accompanying upgrades. The port of Gaženica was put into operation with a temporary terminal building in April 2015 for all types of domestic ferry transport and cruise ships, and in early July 2015 for ferry vessels in international traffic. The

passenger terminal building was inaugurated on March 24, 2019. The relocation of the ferry port from the old town to a new location in Gaženica has long-term ensured the sustainability of the destination and better connections with the islands in the archipelago. Furthermore, the impact of car and truck emissions as well as emissions caused by ferries in the city center has been reduced, which has ensured better air quality for the city's residents and protected the city's cultural heritage from the harmful effects of such pollution. Practically in the first year of the port's operational operation, the entire ferry traffic was relocated from the city center, which caused 500,000 vehicles and about 1,700,000 fewer passengers in the city, as well as an enormous reduction in congestion at the destination. It was the dispersion of passengers that contributed the most to the excellent results in the analysis of CO2 (Carboon Footprint) at the destination, and the conclusion is that Zadar is ahead of other destinations in the Mediterranean and beyond.

However, this research shows that there is a lot of room for improvement - primarily with waste management in the port, but also at the destination. Perhaps the biggest threat lies in the fact that the destination is not yet ready for a more serious and sustainable reception of ship-generated waste, but these issues go beyond the competences of the entities in the ECOWAVES project and are the subject of a wider discussion.

Furthermore, the port has all the national documents and procedures for waste disposal, however, and the under-capacity of staff within the Zadar Port Authority as well as other key entities causes weaker monitoring of these processes. One of the observed shortcomings is the absence of a long-term waste management plan in the port as a significant part of the future environmental protection plan of the port of Zadar.

Since it is a very frequent port with a large number of passengers and vehicles, in addition to managing the removal of waste from ships, it is necessary to pay special attention to maintaining the mainland in such a way as to ensure quality and separate reception of small municipal waste produced by passengers. Waste recycling and the postulates of the circular economy currently exist only in traces and are outside the port area. The circular economy is a system built on reduction, reuse and recycling because waste is considered a valuable resource. Used and defective products can be repaired and reused, some products can be reused directly, and everything else can be recycled. In the light of these conclusions, the installation of ¨ECO ISLANDS¨ on the mainland part of the port area intended for all port users should be considered.

Finally, we should mention the lack of concrete destination cooperation and initiatives such as the initiative launched by the City of Dubrovnik "Respect the City" which through all stakeholders and through periodic action plans proposes measures that affect the further sustainability of the destination and awareness of both residents and visitors/ tourists. Although it is an initiative launched by the City of Dubrovnik, not the Port Authority, this example is an excellent example of cooperation between key actors in environmental management, waste management and promoting the sustainability of the destination.

In any case, we can conclude that in terms of sustainable development Zadar as a destination and the Zadar Port Authority has made huge positive strides in the previous period and thus solved much of the problem in sustainable destination management. It is time to eliminate minor shortcomings and long-term strategic thinking in the direction of developing activities and procedures in waste management.

From the text above we can make a proposal of activities that would be desirable to start in the coming period:

- Develop a long-term environmental / waste management plan;
- Undercapacity of employees in charge of implementing existing waste management plans causes insufficient monitoring - consider hiring an additional employee in the operational sector of the Zadar Port Authority with tasks and responsibilities related to monitoring environmental protection and waste management plans and their implementation. Determine the method of monitoring in terms of supply of technical equipment for process monitoring (sensors, cameras,…);
- lack of containers for separate waste collection / elements of the circular economy are visible only in traces - determine the position in the port and produce one ¨Eco Island¨ with separate containers by type of waste and organize regular emptying of containers;
- Insufficient cooperation and coordination of key stakeholders at the destination - educational actions;
- act on all key stakeholders in the process. Create collaborations and offer alternative educational eco-excursions for cruise passengers.

The entry of the Port of Zadar into the Ecoports initiative/ membership would be very useful. It would enable better monitoring of European port standards and overall better monitoring of environmental processes in the port. We should not neglect the strong promotional component of the Ecoports brand either.

6.5 Slovenia - RDA North Primorska d.o.o. (Port of Koper)

What could contribute to the development of innovative outcomes in waste management in inports? As it seems, there is a lack of regular (annual) exchange of ideas, procedures and technologies of waste treatment between ports in the Adriatic-Ionian region. Indeed, all ports together can hardly compete with the port of Rotterdam, which is fully automated/computerized with a minimum of human input. This would also encourage ports to harmonize their views on waste treatment. In addition, ways could be created for further cross-border processing of waste for the mutual benefit of several ports.

Another important issue is better cooperation between stakeholders. As it appears, there is a lack of regular annual meetings between the representatives of the Ministry of Infrastructure, the Ministry of Environment and Space, Luka Koper, its subsidiary Luka Koper INPO and the representatives of the nationwide waste treatment company in Slovenia (Saubermacher,

which treats 200,000 tons of waste and has over 30 years of experience). At these meetings, the Port of Koper could express its clear interest in treating certain wastes, Saubermacher would explain what they could do and at what cost, and the ministries would monitor and promote progress in waste treatment. Furthermore, these meetings would show the division of responsibility for the maritime sector among the ministries and improve cooperation between the maritime sector and the environmental sector from the point of view of waste treatment.

One of the ways to overcome obstacles that would lead to better treatment of waste in the port could be further thorough inspections of the licensed (governmental) institutions. However, it can be seen in Table 1 that there were at least 21 inspections only in 2020. One might think that the Port community is somehow 'choking' on compliance with the administrative and technical requirements that govern waste treatment procedures. While many of them certainly improve the quality of waste treatment, there are 'inspection issues' to which the port needs to devote its energy, while they do not contribute to solving the main problems. One of the main problems is certainly the treatment of compost that is 'lying' in the port and that 'nobody wants to take for free' to be further recycled or processed. This is also related to the port's strategy on which cargo ships should be delivered and whether this makes economic and environmental sense if the processing of organic waste is a (local) problem.

To what extent is the Port's situation consistent with the current Waste Action Plan? As mentioned in Section 4, the 2019 REMPEC report (REMPEC, 2019, page 6) states that detailed information on marine waste management, such as the Port and Marina Waste Management Plan, is not available in English. In the list of documents collected, it is indicated that the waste treatment plan of the port is written in Slovenian. It is also indicated (page 18) that the Port of Koper has a new Waste Receiving and Handling Plan (WRHP). However, the key message of the 'REMPEC visit' is summarized in the following statement: "It can be concluded that the Port of Koper has an adequate WRHP (waste management plan) that meets the requirements of both the current and the new directive PRF (port reception facilities), so there are no specific proposed revisions." Therefore, if the REMPEC experts conclude that the WRHP is 'adequate', we can hardly offer any further opinion on how the situation in the port complies with the Action Plan from a waste management point of view. However, there is one important statement that points to the Port's condition and strategy in waste treatment, which is listed in Table 7 of the analysis of SWOT under 'Strengths': the applied system for the treatment of ship-generated waste achieves 91% of separate collection of waste. The target of the Action Plan is to achieve 100% separately collected waste by 2025.

6.6 Serbia - Eco Zone Ada Huja

Until the adoption of the Waste Management Plan (2018), waste management in ports was completely undefined. The waste management plan included waste management in all ports, and the action plan all measures that must be implemented in order to establish an integrated waste management system in accordance with national and EU law.

Data on the implementation of the action plan so far are not known, but experience has shown that large goals are often set for the achievement of which there are not enough financial resources. Also, the mentioned feasibility studies and projects were made more than five years ago, but they were not conducted.

The Port Agency, as the client of the Waste Management Plan, should make a cross-section of the planned and realized and revise the Plan in order to make its execution more realistic.

6.7 Albania – Port of Vlora

Port reception facilities require adequate capacity for efficient collection of generated marine litter including garbage.

- Facility shall be capable for receiving those residues and mixtures which are handled within that port, and which must be discharged to reception facilities.
- Port of Vlore shall provide adequate facilities to receive Annex V wastes (garbage) and waste oil from engines.
- Receptacle capacity should meet demand in terms of size, the number of receptacles required and space availability.
- Requirements for handling seasonal fluctuations in demand for waste disposal should be considered when determining receptacle capacity.
- Container size for receiving wastes will affect the servicing schedule which has implications for labour and collection vehicle requirements. More frequent collection reduces health and safety concerns and requires less storage space, but may increase costs through the use of more vehicles and labour.
- The receiving capacity shall be at least appropriate in time and availability to respond to the continuing needs of ships using the port.

The MARPOL Convention regulates that the government of each party should undertake to ensure the provision of the facilities. The MARPOL Convention does not impose that the establishment of port reception facilities should be carried out with direct government involvement. It is left to the members to decide whether the waste reception services are provided by a public enterprise or by a private company. In case of Port of Vlore they have a contract with a private subject, but only for solid waste, but the payment is very small and cannot cover all the work that this subject has to do. In other cases, facility users can be directly charged with service fees for using port reception facilities according to “polluter pay” principle. Nevertheless, it must be noted that such direct fee system may discourage users from bringing their wastes ashore.

In any case, financial contributions from the government will be required to provide adequate reception facilities in ports.

To ensure better port reception facilities and services, the government should consider best port waste management procedures to support and improve port reception facilities, in particular considering the following factors:

- status of national port reception facilities;
- appropriate location and scale for port reception facilities;
- requirements for ships and equipment to collect, store and discharge marine litter; - possible types and quantities of marine litter;
- possibilities for processing and recycling of marine litter and/or its final disposal; - marine litter management policy;
- funding mechanisms.

Providing Information to Users - The user should be told where port reception facilities are located. Maps, placards, posters or notice boards for showing locations of facilities may be useful. Brochures introducing procedures and methods how to use port reception facilities can be distributed to the port users.

6.8 Montenegro - Ministry of Capital Investment (Ports of Bar & Kotor)

The Study presented the status of the available port regulations and the respective regulations on Waste Management for the Port of Bar, as a case study and main maritime hub in Montenegro. The present examination of collected information and the material already collected in previous studies of the ECOWAVES project, lead to the following main conclusions.

The overall legislative and regulatory framework on Port Operation and Waste Management in Montenegro is in general terms aligned with the respective EU requirements, as expected due to the country's candidate country status. That said, it is true the country' waste management sector requires serious efforts to current practices as identified in the EU Commission's Montenegro reports.

The Port's waste management plan appears, at least nominally, to be implemented by the key stakeholders, meaning the two operating companies and the external contractor for the implementation of waste collecting and treatment. However, it is true that the information collected does show some gaps in the overall scheme of operation.

While it is true that the national resources for infrastructure and improvement of equipment are not adequate for the transfer of good practices requiring such upgrades, it is also true that measures can be taken to improve the current practice regarding ship waste management and well as the management of pollution in the waters surrounding ports.

The most important gap identified according to the regulation and practice recorded up to date in the project's studies is the coordination of activities between the different users of the Port. The overlap of activities means that both companies active in the port require the same type of services from the contractor responsible for the waste management while the lack of coordination can lead to monitoring gaps as to quantities and types collected.

In addition, the lack of specialized personnel with regards to waste management means and more specifically the lack of training activities to that end, means that the dependence on external expertise will remain an issue for both operators.

Given the above mentioned, the external environment of operations is the most crucial element for the future improvement of the condition. While any positive steps in the overall direction of improved waste management within the country will benefit via spill over the specialized waste management implementation, on the other hand, it is clear that the efforts to increase the popularity of the country's ports will lead to increasing challenges for waste management.

In addition, the need for adaptation and updating of the national legislation (to which both the Regulatory Framework on Port Operation and the Waste Management Plan are directly linked) remains a positive and a negative aspect at the same time. The positive aspect is that at least nominally the country's legislation has the obligation to keep up with the latest developments, but on the other side this can create new obligations not easily dealt within the limits of the national capacities.

In overall, it is considered essential that the Port of Bar adopts innovative approaches linked to the managerial aspect of waste management that will involve all stakeholders towards a more holistic approach of the problem and that will first of all improve the data flow of information on waste management. This can lead to improved and even profitable flows, and to the improvement of the performance of the port, both in terms of operations and in managing the vessel related waste traffic. Furthermore, it is noted that an increase in the coordination with other regional ports for a equitable distribution of burden by waste collection can mean that these services can be provided more effectively and efficiently, as noted in similar cases of semi enclosed seas such as the Baltic.

The above are the main topics expressed by all the involved ADRION partners in order to identify the points that can be further examined and discussed on local or transnational level (i.e. in meetings with stakeholders, capacity building events, round table discussions etc.) in order to upgrade the port regulations and waste management systems.

Bibliography

Italy – Port Network Authority of the Ionian Sea (Port of Taranto)

- Ionian Sea Port System Authority, *"Waste collection and management plan of the Port of Taranto. Rev. 9"*, 15 May 2020.
- Ionian Sea Port System Authority, *"Information on the methods of managing waste produced by ships and cargo residues in the Port of Taranto. Rev. 5 ",* 13 November 2019.
- Ionian Sea Port System Authority, *"Regulation for the performance of port operations and services in the Port of Taranto"*, 22 March 2021.
- Ionian Sea Port System Authority, "*Regulation for the discipline of the collection of waste service from board ships parked in the port of Taranto and in the dock*", 5 June 2020.
- Ionian Sea Port System Authority, *"Ordinance of port reception facilities, No 08/2009"*, 12 November 2009.
- Ionian Sea Port System Authority, "*Environmental Energy Planning Document",* December 2019
- Environmental and Reuse Production District - DIPAR, "*Update of the Waste Collection and Management Plan in the Port of Taranto – Indications*", 29 April 2020.

Italy – Central Adriatic Port Authority (Port of Ancona)

- Central Adriatic Port Authority of Ancona, "Plan for the collection and management of waste from ships and cargo residues from the Port of Ancona", second revision of 24 March 2021.

Greece – Igoumenitsa Port Authority

- Karantzis, Papageorgiou, 2017, "Waste receipt and management plan of the port of Igoumenitsa"
- Government Gazette 9550 03.08.2009 – "Regulation of internal organization and operation of Igoumenitsa Port Authority S.A"
- Government Gazette 793 22.08.2018 – "Amendment of the Regulation of Internal Organization and Operation of Igoumenitsa Port Authority S.A"
- Antipollution S.A, 2020, "Port Contingency Plan"
- Beza, Kitsantas et.al, 2013, "Ship Waste Management in the Port of Igoumenitsa, Greece"

Croatia – Zadar County Rural Development Agency (Port of Zadar)

- Croatian Bureau of Statistics (2019) *Foreign vessels on cruise in the Republic of Croatia* (Online) Available at: https://www.dzs.hr/Hrv_Eng/publication/2019/04-03-05_04_2019.htm (Accessed 10 January 2021)
- Pickton, D.W. and Wright S. (1998). *What's SWOT in strategic analysis?* Strategic Change, 7 (2), pp. 101-109.
- Port of Zadar Authority (2014) *Ship Waste Management Plan (Online) Available at: https://www.port-authority-zadar.hr/wp-content/uploads/2020/01/PLAN-GOSPODARENJA-OTPADOM-LUZ-2014.pdf (Accessed 10 January 2021)*
- Port of Zadar Authority (2018) *Ordinance on determining the class and quantity of hazardous substances from ships* (online) Available at: https://www.port-authority-

zadar.hr/wp-content/uploads/2020/01/PRAVILNIK-O-ODRE%C4%90IVANJU-KLASE-I-KOLI%C4%8CINE-OPASNIH-TVARI-LUZ-2018.pdf (Accessed 25 December 2021)
- Port of Zadar Authority (2018) *Regulations on the maintenance of order and terms of using the port area under the jurisdiction of the Port of Zadar Authority (online) Available at:* https://www.port-authority-zadar.hr/wp-content/uploads/2020/01/Pravilnik-o-radu-i-uvjetima-kori%C5%A1tenja-luke-na-lu%C4%8Dkom-podru%C4%8Dju-u-podru%C4%8Dju-Lu%C4%8Dke-uprave-Zadar.pdf (Accessed 25 December 2021)
- Port of Zadar Authority (2015) *Ordinance on determining the class and quantity of dangerous substances that may be handled in the port, that is, that may be carried by a ship entering the port area and places in the port of Zadar where these substances will be handled*
- 18. Port of Zadar Authority *Godišnji plan rada*. Internal PZA Report: unpublished.
- Port of Zadar Authority (2021) Territorial needs assessment for the Port of Zadar
- Pallis, Athanasios A.; Papachristou, Aimilia A.; Platias, Charalampos, **Article:** Environmental policies and practices in Cruise Ports: Waste reception facilities in the Med

Slovenia - RDA North Primorska d.o.o. (Port of Koper)
- Anon., 2020. Port regulations, applying to the Freight Port of Koper. Luka Koper d.d., *Available at:* https://luka-kp.si/eng/port-regulations, Koper, p. 27.
- Anon., 2021. Annual Report 2020. Luka Koper Group and Luka Koper d.d., *Available at:* https://www.luka-kp.si/eng/annual-reports, Koper, p. 320.
- REMPEC, 2019. Provision of consultancy services for the implementation of pilots related to the better management of sea-based litter in ports and marinas within the framework of the cooperation agreement between IMELS and UNEP. National Report Slovenia, 21-22 May 2019. Mediterranean Action Plan (MAP); Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), p. 39.

Serbia - Eco Zone Ada Huja
- Law on Navigation and Ports on Inland Waters ("Official Gazette of RS- 73/2010, 121/2012, 18/2015, 96/2015 - other law, 92/2016, 104/2016 - other law, 113/2017, 41/2018, 95/2018, 37/2019 and 9/2020)
- Law on State Affiliation and Registration of Vessels ("Official Gazette of RS - International Agreements", No. 10/2013, 18/2015, 83/2018)
- Law on Maritime Navigation ("Official Gazette of RS - International Agreements", No. 87/2011, 104/2013, 18/2015, 113/2017 - other law and 83/2018)
- Studies on determining the business policy of the Port Management Agency in the field of waste management on navigable rivers in the Republic of Serbia and the provision of consulting services (Waste Managment Plan)
- Water transport development strategy of the Republic of Serbia from 2015 to 2025

Albania – Port of Vlora
- Decision of the Council of Ministers no. 480, dated 25.7.2012 For the approval of the National Emergency Plan "For the response to marine pollution in the Republic of Albania, *Available at:*

https://www.mod.gov.al/images/akteligjore/qnod/05_Plani_emergjencave_ndotje_detare.pdf

Montenegro - Ministry of Capital Investment (Ports of Bar & Kotor)

- Strategy for Development of Maritime Economy 2020-2030, Ministry of Transport and Maritime Affairs
- National Waste Management Plan for Montenegro 2015-2020, Ministry of Sustainable Development and Tourism
- European Commission, Montenegro 2019 Report, Brussels, 29.5.2019, SWD (2019) 217 final
- European Commission, Montenegro 2020 Report, Brussels, 6.10.2020, SWD (2020) 353 final
- Law on Prevention of Marine Pollution from Vessels (Official Gazette of Montenegro, 020/11 of 15 April 2011, 026/11 of 30 May 2011, 027/14 of 30 June 2014)
- Law on Ports (Official Gazette of Montenegro 51/2008, 40/2011 – other law, 27/2013 and 18/2019)
- Law on Waste Management (Official Gazette of Montenegro 64/11)
- Rulebook on waste categorization and waste catalog (Official Gazette of Montenegro 059/13 od 26.12.2013, 083/16 od 31.12.2016)
- Law on marine environment protection (Official Gazette of Montenegro 73/2019)
- Waste Management Plan of Port of Bar for period 2015-2018 (02 No UPI-1127/9 from 15.12.2015)