

## Project ECOPORT 8

### ENVIRONMENTAL MANAGEMENT OF TRANSBORDER CORRIDOR PORTS

Code SEE/A/218/2.2/X



### WP 6.3

### “Final protocol”

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## **SUMMARY**

Nearly half of the global population resides in coastal areas. The dramatic increase of human pressures on the environment, being concentrated along the coasts, leads to degradation of coasts and destruction of habitats. The overwhelming human pressures on the coastal environment have demanded for action in order to stop the ecological destruction. Plans for environmental protection started to be developed – and various local ideas have been translated into reality in some parts, while the difficult recent economic past for some countries from South East European area have not allowed keeping pace with. For this reason a common ecological framework for navigation and port activities has become acutely necessary for the entire South East European sea area.

ECOPORT 8 was born, as a joint South East European effort to develop a common set of rules. These rules aim to allow the sustainable development of port activities by soundly ensuring the environmental quality in a coherent and regionally sound way.

ECOPORT8 looks strategically at SEE coastal areas context and includes countries and ports of Adriatic, Ionian and Black sea. ECOPORT8 covers the Adriatic-Ionian macro region (enlarged to Black Sea), including both scientific organizations and port authorities of Italy, Greece, Albania, Montenegro Romania and Bulgaria, with the aim to create a regional eco-port network.

In order to reach this ambitious aim, the project forecasted three main actions: a context analysis concerning EU and national environmental laws, protocols, regulations and existing environmental protection measures adopted in ports; the monitoring of main environmental parameters, including the installation of two pilot monitoring plans; and finally the preparation of Eco guidelines for SEE ports in order to establish good environmental practice and a shared sustainable protocol between national port authorities to guarantee EU eco-competition and cooperation.



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## 1. Introduction

The present final protocol summarised the results of activities of the ECOPORT8 project "ENVIRONMENTAL MANAGEMENT OF TRANSBORDER CORRIDOR PORTS Code SEE/A/218/2.2/X".

ECOPORT 8 involves 7 ports within the trans-border corridor 8 (port of Bari-Italy, port of Durrës-Albania, port of Bourgas-Bulgaria) and the nearby ports of the SEE area (port of Bar-Montenegro, port of Constanta-Romania, port of Igumenitsa and port of Patras-Greece), which are building common eco and safeguarding policy with shared rules and methodologies. In attempting to guarantee sustainable sea traffic development, the main objectives of ECOPORT8 are to:

- set up a permanent PAN-EU network to develop, strengthen and transfer coordinated initiatives of cooperation for eco-management of PAN-EU corridor ports;
- analyse laws, regulations and measures adopted in ports, conducted through SWOT analysis in order to produce an homogenized SWOT report;
- carry out initial environmental analysis of all ports involved, focused on on-site measurement campaigns able to sustain, verify and update actions for continuous improvement;
- identify common innovative studies, methods and tools (preventative approach), for defining environmental and social risk conditions, reducing environmental impact and supporting its improvement in the partner port areas;
- define a single shared trans-national and sustainable protocol in order to establish common standards of control and monitoring of the principal environmental parameters within the ports;
- promote the continuous improvement of environmental performance of the identified port areas;
- encourage, with respect to networking and institutional partnership principles, the development of collaboration and effective relations among local authorities, citizens and enterprises of all the SEE area with a view to stimulating growth, employment and environmental protection;
- training new professionals on the design and environmental management of port areas.

In order to achieve these purposes, the project is divided into 6 Work Packages, 3 of them are strictly technical:

- WP4: Context analysis
- WP5: Testing-Monitoring surveys on site
- WP6: Eco-sustainable model for PAN EU Corridor Ports

<p><b>WP 4</b></p>	<p><b>Standards Analysis:</b> -Identification and analytical analysis of EU and national regulations within project countries, as well as instruments adopted for port planning; -technical-scientific evaluation and consideration of different adoptions of EU law at national level; -elaboration of final report focusing on environmental and safety issues to be raised by port authorities, thus directing research on relevant issues.</p> <p><b>Documental analysis on:</b> current situation within the ports involved (e.g. impact of goods handling); the existence of environmental policies, considering data gathered by other projects; already certified ports, with focus on acquisition of environmental monitoring data, e.g. Livorno (Italy), the first EMAS certified EU port and Novorossiysk (Russia), already involved in satellite-based monitoring</p> <p><b>Common SWOT analysis and final report good practices :</b> - Identification of the different regulations and measures adopted, conducted through SWOT analysis; - Editing of an improvement programme of the eco performance for the whole port areas, to define policy guidelines allowing a strategic environmental approach. - Developing shared strategies of sustainable development which encourage the balanced development of integrated port-territory systems.</p>	<ul style="list-style-type: none"> <li>• <b>INTERNAL documents (1 Report with all relevant laws of EU and national regulation and instruments for port planning, identifying legal contrasts between different countries; 1 Report on current situation within the port involved) ;</b></li> <li>• <b>1 SWOT ANALYSIS;</b></li> <li>• <b>1 Environmental improvement programme</b></li> </ul>	<ul style="list-style-type: none"> <li>• 1 Common methodologies adopted: SWOT analysis published on line by the ECOPORT 8 website</li> </ul>
<p><b>WP 5</b></p>	<p><b>Choice monitoring instruments:</b> - Definition and choice of the most suitable survey apparatus, based on the parameters to be monitored: numerical simulations, hydrodynamic factors, airborne particle levels, pollution sources. -Localised testing for the coherent definition of apparatus needed, and the starting point for the choice of monitoring procedures -Investigation of market costs of the relevant apparatus. <b>Ports involved in the monitoring: Bar, Bourgas</b></p> <p><b>Selection of monitoring procedures:</b> establishment of investigative procedures and instruments, according to the sensitive parameters and the instruments chosen. Each survey involves: registration intervals; definition of regular intervals for the updating of the database; timeframe of data elaboration; A key phase involves monitoring activities along sea-routes with the heaviest shipping traffic. <b>Ports involved in the monitoring: Bar, Bourgas</b></p> <p><b>Planning monitoring network and data processing.</b> This activity includes the drafting of: the executive monitoring network plan, monitoring standards, procedures of data elaboration and storage as well as the dissemination of results. The monitoring network will allow the definition of the current situation of the principal sensitive parameters, and the setting up of an effective risk management system to prevent irreversible environmental damage. <b>Ports involved in the monitoring: Bar, Bourgas</b></p> <p><b>Testing:</b> -Acquisition and installation of the necessary apparatus in the 2 ports chosen; -The gathering of data through measuring on site, creating an initial database able to verify, successively, the benefit of actions of environmental improvement, or the consequences of new infrastructural interventions and the validity of specific eco-management practice; -Implementation of embryonic monitoring network. <b>Ports involved: Bar and Bourgas.</b></p> <p>Elaboration and input of acquired data into a <b>WEBGIS</b>, made public through the ECOPORT 8 website. Such a system allows for comprehensive data management (interrogation, extraction, comparison, overlapping, graphic output and tabulation). The on-line GIS System will be regularly up-dated and integrated with specific information services already in use.</p>	<ul style="list-style-type: none"> <li>• 1 Monitoring network plan in the 2 pilot sites;</li> <li>• 2 Pilot plans in the ports of Bar and Bourgas;</li> <li>• 2 Databases of monitoring data;</li> <li>• 1 updating WebGIS for eco-data;</li> <li>• 1 Report including chosen criteria of parameters investigated, instruments installed, monitoring procedures and data obtained;</li> <li>• 1 Paper, published in international technical journal.</li> </ul>	<ul style="list-style-type: none"> <li>• 1 Common methodologies adopted and standards established: Common monitoring standards and procedures;</li> <li>• 3 Pilot actions prepared</li> <li>• 1 Innovative product developed: Monitoring network;</li> <li>• 1 Permanent information channels in operation: WEBGIS</li> <li>• 2 Pilot actions implemented;</li> <li>• 2 investment projects implemented (324.000,00 euro)</li> </ul>
<p><b>WP 6</b></p>	<p><b>Common ECO guidelines:</b> - Drafting of a common and shared guidelines document determining the effectiveness of the measures adopted by each port as part of a wider network. - publication and information transfer to other ports aimed at promoting common good eco-practice across the whole SEE area; - suggestion of suitable infrastructural development for improving the performance in services provided by port authorities</p> <p><b>Capacity building:</b> planning and set-up of training course (140 hours) for 18 trainees (3 from each country) to create eco-management system experts within ports and co-structures. The course, in English, is based on an interventional training model and includes: 60 class hours-in Bari at Universus; 80 project work hours (6 groups/6 mentors, 1 for each country to be realized in the 6 port authorities involved );common e-learning support, benefiting trainees and 26 project staff.</p> <p><b>Common final protocol:</b> elaboration of a final protocol to establish tools, methods and good practices thus facing the challenges and openings linked to environmental issues dealt with by port authorities. The document focuses on a global management approach highlighting both the socio-economic opportunities stemming from the increase in maritime traffic whilst taking into account higher environmental quality levels.</p>	<ul style="list-style-type: none"> <li>• 1 Eco guidelines for PAN EU ports in order to establish good environmental practice;</li> <li>• 1 A shared PAN-EU and sustainable protocol between national authorities to guarantee EU eco-competition and cooperation within maritime traffic ;</li> <li>• 2 Handbook and short brochure regarding the Pan European eco guidelines to distribute at targeted end-users;</li> <li>• 1 Paper published in an international journal in the field, including final project results;</li> <li>• 1 Training course for eco-management technicians;</li> <li>• 1 Study visits organized during training course;</li> <li>• 44 Participants involved in training events (including e-learning).</li> </ul>	<ul style="list-style-type: none"> <li>• 1 Common standards established: eco-guidelines for PAN EU ports;</li> <li>• 26 staff members with increased capacity;</li> <li>• 1 Permanent SEE network for eco PAN-EU corridor ports</li> </ul>

Table1. Description of Technical Work Packages of Ecoport8 Project



## 2. Common approach and joined environmental policy for Ecoport 8 ports

Through the Context Analysis the Ecoport8 project reached its first results: the diagnostic of the ports involved gives a description of all features, services and facilities, operators and activities in ports; but the diagnostic was also “environmental” with the analysis and comparison of all existing environmental policies adopted by SEE ports. In addition with the Standard Analysis the application of strengths, weaknesses, opportunities and threats analysis to formulate a strategy concerning environmental protection measures and practices in the Ports of Corridor 8 is provided. The enlarged research knowledge on ports allowed understanding of the points of strength and opportunities, where to invest and, at the same time, the points of weakness and threatens which to be improved. The SWOT analysis is used as a management tool and a good basis to formulate successful strategic improvement program of the eco performance for the whole port areas, to define policy guidelines allowing a strategic environmental approach. On the basis of this knowledge additional instruments for the improvement program for future environmental protection and management of the Corridor 8 ports in accordance with the requirements of international and European standards for ports were proposed and so the common objectives and methodologies for environmental protection in the Ecoport8 ports were defined.

ECOPORT 8 aims to improve the quality of ports of the SEE area with the relevant tools for environmental management. The improvement program of the eco-performance of the port areas offered by us in the project develops common ECOPORT8 strategic environmental approach which encourages the balanced development of integrated port territory system. The common ECOPORT8 strategic environmental approach is a logic consequence of the performance context analysis of the present state in SEE ports and environmental legislation and the following main strategic goals were highlighted as a part of it:

The first strategic goal is: **An assessment of the current environmental status of the port waters, air, soil and maritime habitats and identification of significant environmental impacts from port activities and ships in ports**

This goal has a preparatory character for the corridors ports. By means of the implemented analyses important information about ports environment preservation and the potential significant impacts on it was obtained. But the appraisal of the concrete status and the identification of the considerable effects on the environmental for every single port will be possible after implementation of measurements and monitoring. For two of the corridor ports this are accomplished in the frame of the project. The others will make use of the methodology developed for the monitoring and the elaborated system of indicators for quantitative assessment of the environment status in the port.

The second strategic goal is: **Development and adoption of an environmental management system comprising environmental risk assessment, land & maritime use planning and ICZM’ instruments as important parts of it.**

The environmental management system in the common ECOPORT 8 strategic approach is considered in more enhanced meaning where environmental risk assessment, land & maritime use planning and ICZM' instruments are part of it.



The third strategic goal is: **Implementation of environmental management system in ports of the SEE area**

The applied common environmental approach aims towards the sharing of common regulations, common eco-guidelines, rules and standards and via this approach the results of the project provided the port authorities organizations the opportunity to acquire environmental certification including to control, reverse and prevent degradation of the coastal environment from pollution.

### 3. Environmental monitoring

The environmental monitoring is one of the main concerns and tasks of the ECOPORT8 Project. It is essential for detecting in advance of any environmental pollution, caused by port activities and planning and implementing the anti-pollution measures and activities in environmental protection programme . Therefore, the purpose of the monitoring is to collect current information for condition of main parameters, determining sea water quality, atmospheric air, noise and all possible impact on them by the port activities in port. Such approach allowed initiating corrections in the technological operations for environment protection and supported port management.

Realization of the monitoring plan includes the following stages:

- Analysis of current situation in Ports;
- Determining of Sensible parameters and methodology for the monitoring program;
- Sampling program design, including selection of sampling points, determination of sampling frequency, selection of measurement technique and equipments for each sensible parameter;
- Description of Pilot Monitoring Plan (PMP) Procedure;
- Recommendations for the implementation of the Pilot Monitoring Plan (PMP).

The testing phase was carried out through the use of instruments installed directly both in the sea and on land at the two sites (Port of Burgas and Port of Bar), thus providing, for all ports involved, homogenous data which allows for the scientific evaluation of the quality of the parameters under investigation.

Duration of measurements is 1 year. Gathered data are elaborated and put into WEBGIS (Geographical Information System) made public through the Ecoport 8 website, allowing for comprehensive data management. The on-line system will be regularly up-dated and integrated with specific information services already in use.

### 4. Ecoguide on data and results

**The Ecoguide is focused on:**

- Helping ports to define an environmental policy based on their capabilities already had and the future planed actions and decisions oriented to sustainable development of their activities
- Guiding ports to set an efficient managerial structure (at the organization level or environmental department) according to ISO 14001 that comprise a well organized DOCUMENTED SYSTEM and a CONTROL SYSTEM, which are sustained on facts coming from applied environmental policy
- To plan their activities as to reach the main aspects of correct management, documenting the environmental aspects, to identify the legal requirements (WP4 releases), to set the main objectives, targets and programmes



- How to performance environmental port monitoring in order to collect actual information for main parameters, determining sea water quality, atmospheric air and all possible impact on them by the port activities
- To show what means in terms of implementation and operation of ISO 14000 standards, the effort that ports must do regarding their certification (resources, attributions, documents elaboration etc).
- How to solve after implementation the feedback of their actions by checking the efficiency of the environmental measures

## 5. Description of Web GIS

Ecoport 8 WebGIS is a web-based application presenting measurements of environmental parameters in the project ports through an interactive electronic map based on Google maps framework. The application is open to the public and it can be accessed through Internet using well-known internet browsers (Internet Explorer, Mozilla Firefox, Google Chrome, etc.). Furthermore, provides multilingual support to users who can choose between six different languages (English, Greek, Italian, Albanian, Romanian and Bulgarian).

Using Ecoport 8 WebGIS, users can browse the interactive map by moving the mouse, zooming in and out, and selecting points of interest of a dedicated menu. Furthermore, users are able to view information regarding the ports and the sensors used for the measurements of environmental parameters in the area of the ports of Burgas (Bulgaria), Bar (Montenegro) and Bari (Italy). Moreover, the application is providing users with reports regarding the parameters' measurements in the form of tables, charts and animations.

Additionally, Ecoport 8 WebGIS provides more services to registered users. The registration is free of charge and includes an one-step procedure. Registered users gain access to tools for retrieving geographical information from the map such as distance and area calculation, location of a point on map based on given coordinates and map save and print. Registered users of Ecoport 8 WebGIS, are able to save their reports about the measurements of port sensors in form of queries in order to access them any time they prefer.

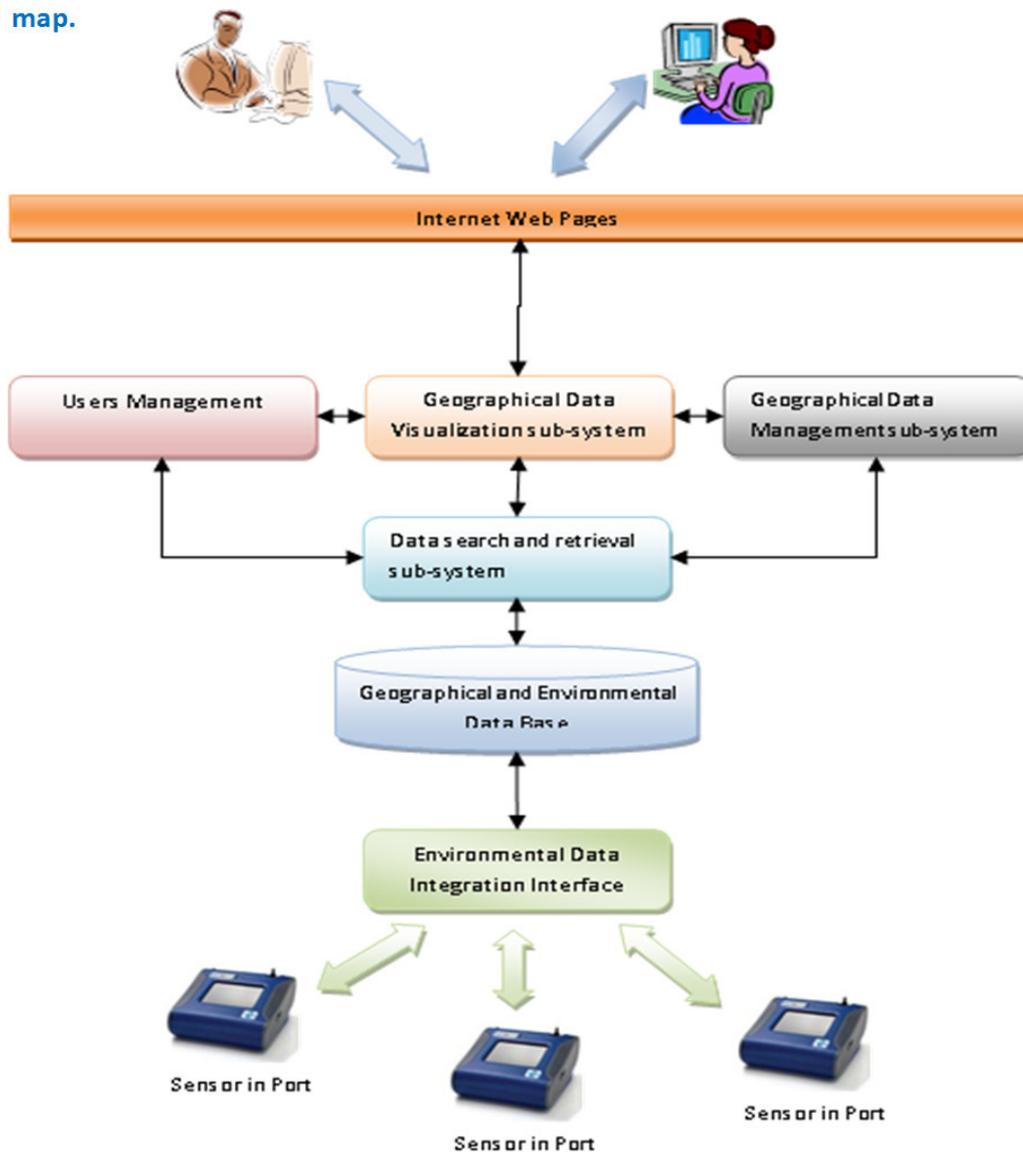
Another feature of Ecoport 8 WebGIS is the automatic collection of the measurements of the environmental parameters from the involved ports. The measurements are periodically collected from the local port servers, which are interconnected with various sensors located in each port area. The collection is automatically processed by Ecoport 8 WebGIS application and it is invisible to the users. Data integration with Ecoport 8 Web GIS requires internet access to the server where the monitoring parameters values are stored and a clear structured text-based protocol for data exchange. The values can be exchanges in well-known open standards as Comma Separate Value (CSV) or eXtensible Markup Language (XML) files through simple HTTP/HTTPS requests or REST web services.

Ecoport 8 WebGIS application consists of the sub-systems depicted in the Figure below:

- Environmental Data Integration Interface is responsible to collect automatically the environmental measurements from the ports

- Geographical and Environmental Data Base acts as the data repository of the application, where all the geographic and environmental information are stored
- Data search and retrieval sub-system acts as a mediator between the three processing sub-systems and the data base. It is responsible to search and retrieve data from the data base based on the queries sent by the processing sub-system
- Users Management sub-system is a processing sub-system that provides the administrative features for the user of the system
- Geographical Data Management sub-system is a processing sub-system that processes the users' report requests
- Geographical Data Visualization sub-system is a processing sub-system that interacts with the users and generates the web pages of the interactive map, viewed through the Internet. The sub-system uses Google Maps API in order to display the map.

map.



## 6. Commitment of the Ecoport 8 ports

*The last results reached at the end of the project activities are commitments to respect certain environmental rules that would allow accordance with the projects objectives, "to establish SEE routes as environmental corridors".*

*The Port Authorities of Bari, Bar, Bourgas, Constanta, Durres, Patras, Igumenitsa, involved in the Ecoport8 Project – Code SEE/A/218/2.2/X, on the base of outcomes of the project activities and in particular the utility to ensure a development of activities and infrastructures of the port with respect of the surrounding environment, they commit to value the possibility to insert, in their acts of strategic planning and infrastructure programs, the following activities and tools useful to the general objectives of the Ecoport8 Project.:*

- ❖ To adapt and improve the existing management systems for environmental protection on the basis of the developed analysis, strategic objectives, approach and eco-guidelines developed by the Ecoport8*
- ❖ To continue environmental monitoring and measurement of environmental parameters in Ecoport8 ports*
- ❖ To ensure processing of the measurement data as to attract competent staff and their training*
- ❖ To ensure free access to Ecoport8 website and to data collected by Ecoport8 port monitoring systems in Ecoport8 WebGIS*
- ❖ To continue the Exchange between research institutes, available to give answers to Port Authorities on environmental management*
- ❖ Exchange experiences and best practices in order to share innovative management tools for monitoring of the port activities*
- ❖ Start activities of information and communication oriented to the port operators with position of responsibility on the port area*

*The following environmental item commitments including prevention of 2 main impacts trough operational control, monitoring and measuring are chosen as the most important for environmental protection in SEE port area. The aspects are different and depending on specific activities and conditions in every SEE port.*

### **1) Prevent and reduce the water discharge of pollutants from ships, vehicles, port equipment, fecal sewer, waste waters into the port seawaters**

*ENVIRONMENTAL IMPACT : Water pollution*



*ENVIRONMENTAL ASPECTS: Discharges of fecal sewer into the sea water; Oil leaks into underground waters; Effluent from atmospheric water sewage system into the port aquatorium; Outflow from washing of workshops areas and garages into water; Outflow of oils, detergents and lubricants into water; Hazardous waste disposal*

**2) Prevent and reduce emissions into the air of dust from bulk storage and handling activities, from oil terminals, from transport vehicles**

*ENVIRONMENTAL IMPACT: Air pollution*

*ENVIRONMENTAL ASPECT: Dust emissions into the air from bulk storage and handling activities; Emissions into the air from oil terminals; Emissions into the air from transport vehicles and forklifts in workshop areas; Emissions into the air from ships;*

## **7. Further steps**

Creating the **regional eco-port network** in the SEE area is the main achievement of the ECOPORT 8 project. SEE countries are in strategic position concerning sea ports, which are important link in a long logistical chain. It is necessary to improve the accessibility of these ports. The further *Transnational Enhancement of ECOPORT8 Network of SEE ports* would be the next important step to develop, strengthen and transfer new coordinated initiatives for further cooperation in order to improve accessibility of ports in this region as a part of *the trans-European transport network (TEN-T)*.



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