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## Benchmark dynamics in the environmental performance of ports

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## ABSTRACT

This paper analyses the 2016 environmental benchmark performance of the port sector, based on a wide representation of EcoPorts members. This is the fifth time that this study has been conducted as an initiative of the European Sea Ports Organisation (ESPO). The data and results are derived from the Self-Diagnosis Method (SDM), a concise checklist against which port managers can self-assess the environmental management of their port in relation to the performance of the EcoPorts membership. The SDM tool was developed in the framework of the ECOPORTS project (2002–2005) and it is managed by ESPO. A total number of 91 ports from 20 different European Maritime States contributed to this evaluation. The main results are that air quality remains as the top environmental priority of the respondent ports, followed by energy consumption and noise.

In terms of environmental management, the study confirms that key components are commonly implemented in the majority of European ports. 94% of contributing ports have a designated environmental manager, 92% own an environmental policy and 82% implement an environmental monitoring program. Waste is identified as the most monitored issue in ports (80%), followed by energy consumption (73%) and water quality (70%).

## 1. Introduction

In order to study and analyse the environmental performance of ports, the European Sea Ports Organisation (ESPO) has regularly commissioned surveys in European ports. In February 1996, the first environmental questionnaire was conducted. The responses of 281 ports from 15 different European countries were useful to obtain an overview of the most important environmental problems in ports. The results of a second study with the participation of 129 ports were published in April 2005 (ESPO, European Sea Ports Organisation, 2005). The survey identified the issues which were at stake for EU ports in the field of environment and it also established a port sector's European benchmark of environmental performance. In 2009, a third, major environmental survey was carried out (ESPO, European Sea Ports Organisation, 2010), involving 122 ports from 20 European Maritime States. This questionnaire was more comprehensive than those previously undertaken since it also covered issues related to Environmental Performance Indicators (EPis), local community engagement, energy efficiency and port planning and development. For the first time, data collection benefited from the development of a web based tool that facilitated online submission by interested ports and improved analysis and interpretation of results. In spring 2013, ESPO conducted the fourth

data collection exercise which, with the input from 79 ports, contributed to the publication of the ESPO Port Performance Dashboard (ESPO, European Sea Ports Organisation, 2013; Puig et al., 2015).

Three years on from that study it was considered timely to establish a new benchmark performance (2016) and to update the main environmental concerns of ports and the trends of the sector. The results presented in this paper form the basis of the 2016 port sector benchmark performance and also provide future actions to improve the port sector trends. Nevertheless, best practices are also highlighted in this paper as an example for ports starting with environmental management.

This paper is structured into five main parts: i) the origin of the research and the structure of the paper ii) the methodology which defines the system used to obtain the data and analyses the current ports' sample; iii) the benchmark performance of the year 2016, iv) the trends of performance over time and v) conclusions from the analysis and interpretation of the ports' responses. The successive surveys of the EcoPorts' SDM database suggest that the responses are reasonably representative of the European sector given the make-up and characteristics of the respondent port authorities.

Since the individual port responses are treated anonymously and in strict confidence, the data provided in this paper does not show the

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results of individual ports; it presents the average results of the port sector. In some cases, these results are further broken down by port size and location.

Individual port authorities, and indeed the port sector itself, both are under increasing pressure to demonstrate their environmental credentials and performance in terms of compliance, risk-reduction and sustainability. Trends in their environmental performance and progress towards continual improvement are important components of the 'license to operate' as perceived by a wide range of stakeholders.

## 2. Methodology

The methodology section contains a description of the data collection system, the structure of the survey and the sample analysis.

### 2.1. Data collection system

The data presented in this paper is obtained from the responses of EcoPorts members to the Self-Diagnosis Method (SDM) questionnaire. This method gathers the information on ports every two years, in particular the current study presents the data from 2015 and 2016. The SDM is a tool that allows port managers to periodically assess the quality of the environmental management and the progress achieved through time in their port (Darbra et al., 2004). It is also considered that this methodology is helpful for identifying environmental risk and for establishing priorities for action and compliance, since it identifies the issues which the port needs to improve.

SDM is a well-established methodology. It was developed in the framework of the ECOPORTS project (2002–2005) and has undergone periodic reviews in order to keep it update with changes in legislation and issues of interest to the sector. The current version of the tool (updated in spring 2015) consists of a checklist of 253 qualitative questions (with a YES/NO response), classified into nine categories. It is widely adopted method throughout the maritime states of Europe and increasingly outside Europe via the EcoSLC Foundation route for ports outside Europe ([www.ecoslc.eu](http://www.ecoslc.eu)). The performance of 2016 (presented in this paper) is based on the responses of 91 port managers from 20 different European Maritime States. Their responses form the basis of the port sector's benchmark of performance. The SDM is designed to be user-friendly and to serve as a checklist of the fundamental components of a credible Environmental Management System (EMS). It is based generically on the ISO 14001 approach.

One of the main benefits of submitting the SDM for reviewing is that ports receive confidential feedback and advice. The individual port responses are treated anonymously and in strict confidence. The analytical review includes:

- A projection of the port's answers against the European benchmark of performance.
- A GAP analysis between the port's current organisation and performance and the requirements of established environmental management standards, such as ISO 14001, Eco-Management and Audit Scheme (EMAS) and Port Environmental Review System (PERS).
- A SWOT (Strengths, Weaknesses, Opportunities, Threats) identification of the port's environmental management performance.
- An analytical report containing specialist advice and recommendations on the current status and the further development of the port's environmental management program.

The SDM tool is available to be completed on-line through the environmental website of ESPO at [www.ecoport.com](http://www.ecoport.com).

### 2.2. Structure of the SDM

The SDM checklist addresses different issues of environmental management in ports. The different sections that compose the SDM

**Table 1**  
Sections and number of questions of the SDM.

Section	Title	Number of questions
A	Environmental policy	93
B	Management organisation & personnel	12
C	Environmental awareness and training	7
D	Communication	18
E	Operational management	21
F	Emergency planning	19
G	Environmental issues and monitoring	23
H	Review and audit	21
I	Services to shipping	39

**Table 2**  
List of countries represented in the sample and the number of participating ports.

Country	Number of ports
Spain	12
United Kingdom	12
France	10
Netherlands	9
Denmark	8
Germany	6
Greece	5
Sweden	5
Italy	4
Norway	4
Croatia	3
Ireland	3
Finland	2
Latvia	2
Belgium	1
Cyprus	1
Romania	1
Estonia	1
Lithuania	1
Portugal	1

are presented in Table 1 (see Darbra et al., 2004):

### 2.3. Sample analysis of the SDM 2016

91 ports from 20 different European Maritime States (out of 23) participated in this assessment. Table 2 below provides the list of EU countries represented and the number of contributing ports of each country. Spain and the United Kingdom are the countries that have the most ports represented.

Apart from the country, there are other, relevant characteristics of the ports that are included in the database. One of them is the location (geographic settings) of the port, as shown in Fig. 1. As it can be seen, the sample is reasonably well balanced concerning the different location of the ports.

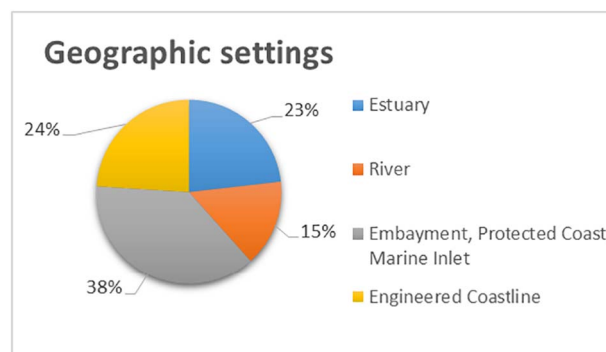


Fig. 1. Geographical characteristics of the sample.

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