



## ESPO / EcoPorts Port Environmental Review 2016

*Insight on port environmental performance and its evolution over time*

*April 2016*

### Introduction

Building on a long tradition that goes back to 1996, ESPO undertook in January 2016 the Port Environmental Review 2016. The aim of the review is to update the top 10 environmental priorities of European ports and to produce further benchmark figures in key areas of port environmental management.

A major part of the Environmental Review focused on redefining the environmental priorities of the European port sector. The current report presents the top-10 of environmental priorities for 2016 and provides relevant insight and analysis. This data is important as it identifies the high priority environmental issues on which ports are working and sets the framework for guidance and initiatives to be taken by ESPO and EcoPorts.

Furthermore, the report presents key performance data on the environmental management of European ports for 2016. The 2016 results are further compared with those from 2013<sup>1</sup>, when the last similar exercise took place, highlighting variations and trends over time. Establishing baseline figures, monitoring trends over time and transparently reporting on those gives credibility to the European port sector and is consistent with the environmental policy of ESPO<sup>2</sup>.

The Port Environmental Review 2016 and the reporting on its outcomes took place in full cooperation and coordination between ESPO ([www.espo.be](http://www.espo.be)), EcoPorts ([www.ecoport.com](http://www.ecoport.com)) and PORTOPIA ([www.portopia.eu](http://www.portopia.eu)). In fact, the basis of reporting is fully in line with the environmental performance indicators that were developed in the PORTOPIA project. Furthermore, the results are also included in the PORTOPIA European Port Industry Sustainability Report for 2016<sup>3</sup>.

### Data collection

The data collection of the 2016 environmental review took place through the completion of the EcoPorts Self Diagnosis Method (SDM) checklist. Contributing ports were asked to join the EcoPorts network and provide the requested data by completing the SDM checklist. This required a higher level of commitment from the ports in terms of time and effort but added value in terms of consistency. SDM is a comprehensive checklist that requires much more data than the one purely used in the scope of this review. ESPO and EcoPorts recognise this and are very thankful to the 91 ports from 20 EU maritime Member States (out of the 23) that contributed to the review. The data collection took place in January and February 2016.

---

<sup>1</sup>

[http://www.ecoport.com/templates/frontend/blue/images/pdf/Analysis\\_of\\_top\\_environmental\\_priorities\\_2013.pdf](http://www.ecoport.com/templates/frontend/blue/images/pdf/Analysis_of_top_environmental_priorities_2013.pdf)

<sup>2</sup> <http://www.espo.be/publications/espo-green-guide-towards-excellence-in-port-enviro>

<sup>3</sup> <http://www.espo.be/media/news/EuropeanPortIndustrySustRep2016-dimished.pdf>

Table 1 below provides the list of EU countries represented and the number of participating ports for each country. Spain and the United Kingdom are the countries that have more ports represented, 12 each one, followed by France with 10 ports.

Table 1: Number of contributing ports per country

Country	Number of contributing 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

The two figures below demonstrate the characteristics of the sample of respondent ports in terms of geographical location (figure 1) and annual tonnage of commodities handled (figure 2).

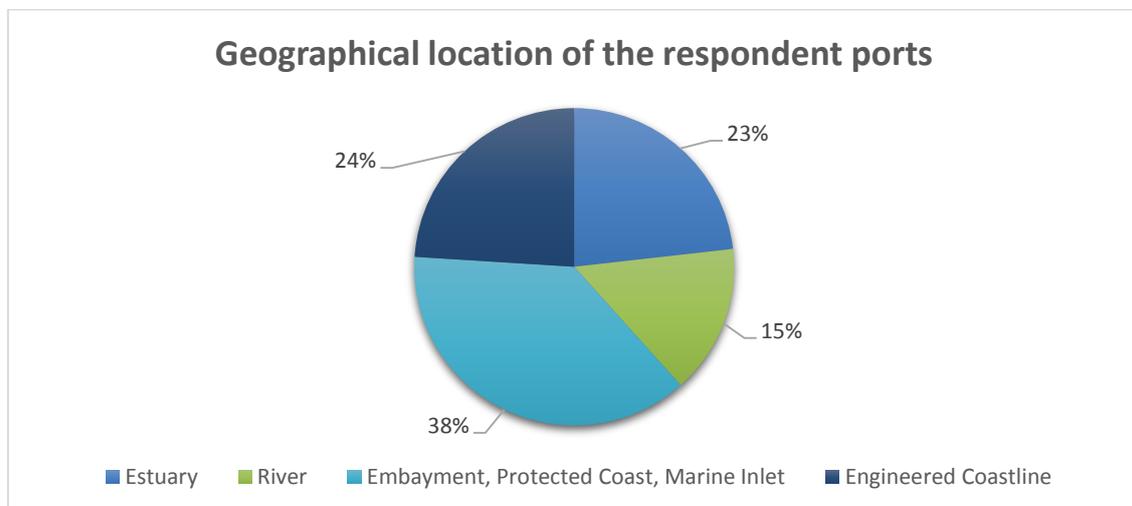


Figure 1: Geographical location of the contributing ports

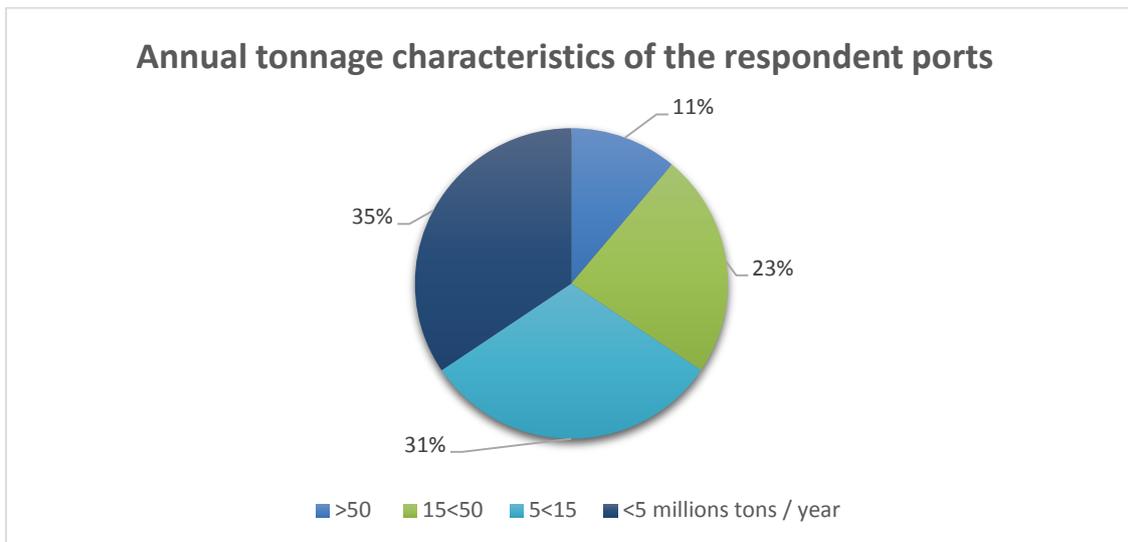


Figure 2: Annual tonnage characteristics of the sample

It can be seen that the sample is quite balanced regarding those characteristics. It is interesting to note that 2 out of 3 of the respondents are smaller and medium ports (handling less than 15 million tons per year). Respondent ports demonstrate the range of port characteristics that comprise the ESPO membership and the fact that each port is unique in terms of its environmental setting and aspects. The response rate and the diversity in ports' typology allow drawing a representative overview of the EU port sector.

### Environmental management indicators and performance

This section provides insight on the environmental management performance of European ports. A set of 10 key management indicators has been developed for this purpose in cooperation between ESPO, EcoPorts and PORTOPIA. These have also been monitored back in 2013 and the 2016 review comes to update the figures and to show their evolution. Table 2 below shows the percentage of positive responses to each of these 10 indicators in the review of 2013 and 2016, so that the variations over time are demonstrated.

Table 2: Percentages of positive answers and 2013-2016 variations on key environmental management indicators

Key Environmental Management Indicators		2013 (%)	2016 (%)	Changes 2013-2016
A	Certified Environmental Management System (EMS)	54	70	+16
B	Existence of an Environmental Policy	90	92	+2
C	Environmental Policy making reference to ESPO's policy documents	38	34	-4
D	Existence of an inventory of relevant environmental legislation	90	90	-



E	Existence of an inventory of Significant Environmental Aspects	84	89	+5
F	Definition of objectives and targets for environmental improvement	84	89	+5
G	Existence of an environmental training program for port employees	66	55	-11
H	Existence of an environmental monitoring program	79	82	+3
I	Documented environmental responsibilities of key personnel	71	85	+14
J	Publicly available environmental report	62	66	+4

Clear positive trends can be demonstrated over time for the majority (7/10) of the selected indicators while one stays stable and 2 decline. The rise in the percentage of ports that are certified by a recognised Environmental Management System (EMS), such as ISO 14001, PERS and/or EMAS, from 54 to 70 % between 2013 and 2016 is particularly impressive. On the other hand the results show an 11 % decrease in the percentage of ports that have an environmental training programme for their employees and this clearly requires further investigation by ESPO.

The results demonstrate that the big majority of European ports have implemented an Environmental Policy (92 %), maintain actual inventories of applicable environmental legislation (90%) and of their significant environmental aspects (89%), define objectives and targets for environmental improvement (89%), have documented environmental responsibilities of key personnel (85%) and monitor their environmental impact (82%). The trends are also positive on communicating efforts with 2 out of 3 of the respondent ports producing a publically available environmental report on a regular basis.

The 10 indicators of the table can be summarised by a single figure, the so called Environmental Management Index (EMI) that was developed by PORTOPIA. A specific weighting is attributed to each of the 10 indicators / components of the Index that reflects its relative significance for environmental management. The Index is then calculated by multiplying the weightings associated to each environmental management indicator to the percentage of positive responses as described in the formula below.

$$EMI = A*1.5 + B*1.25 + C*0.75 + D*1 + E*1 + F*1 + G*0.75 + H*1 + I*1 + J*0.75$$

The table below shows the Environmental Management Index of European ports in 2013 and in 2016 respectively. The evolution confirms the positive trends identified.

Table 3: Environmental Management Index 2013 - 2016

	2013	2016
<b>Environmental Management Index</b>	7.25	7.72

As stated above, the overall improvement over time of European ports in environmental management is well demonstrated by the increase in the percentage of ports that achieve certification under one or more of the established environmental management systems (EMS). A total of 64 ports out of the 91 that contributed to the review are EMS certified, being 46 of

them under ISO 14001, 5 under EMAS and 26 under the EcoPorts Port Environmental Review System (PERS) as shown in the following figure. Some ports are certified under more than one system.

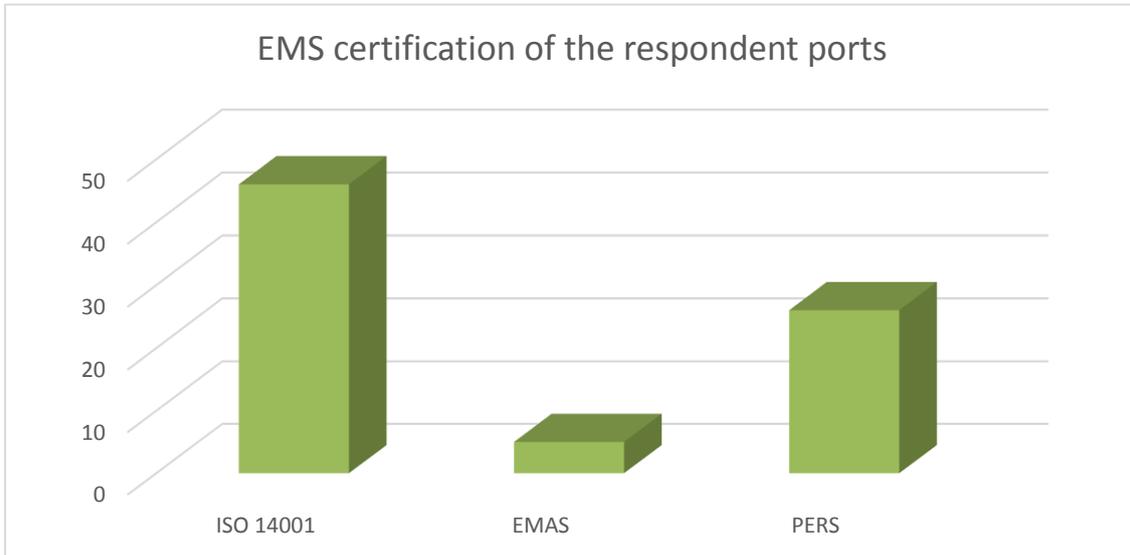


Figure 3: EMS certification of the respondent ports

### Environmental monitoring programmes: components and evolution

Environmental monitoring is crucial for ports both in terms of evaluating the impact of their operations and of prioritising actions accordingly. It is then important to investigate the components of the environmental monitoring programmes of European ports and their evolution. Table 2 in the previous section established that the 82 % of respondent ports have an environmental monitoring system in place. Following table 4 presents the main components of these monitoring programmes, in other words it highlights the environmental issues that ports actually monitor. The table also compares the 2016 results with the relevant data from 2013.

Table 4: Components of port environmental monitoring programmes

Environmental issues being monitored by European ports	2013 (%)	2016 (%)	% change 2013-2016
Waste	67	79	+12
Energy consumption	65	73	+8
Water quality	56	70	+14
Air quality	52	65	+13
Sediment quality	56	63	+7
Water consumption	58	62	+4
Noise	52	57	+5
Carbon Footprint	48	47	-1
Soil quality	42	44	+2
Marine ecosystems	35	36	+1
Terrestrial habitats	38	30	-8

In 2016, waste is pointed out as the most monitored environmental issue by European ports (79%), same as in 2013. It is followed by energy consumption (73%), water quality (70%) and air quality (65%). It is also worth noting that the percentage of ports that are monitoring these top priority environmental issues has increased significantly between 2013 and 2016. More than half of the respondent ports also include sediment quality (63%), water consumption (62%) and noise (57%) in their environmental monitoring programmes. The trends in relation to the calculation and monitoring of carbon footprint remain stable with almost half of the respondent ports (47%) being committed to this exercise. Soil quality, marine ecosystems and terrestrial habitats are the issues that are less commonly included in the ports environmental monitoring programmes.

### Top 10 Environmental priorities for 2016

Building on a long tradition, ESPO and EcoPorts regularly monitor the top environmental priorities of European port authorities. This data is important as it identifies the high priority environmental issues on which ports are working and sets the framework for guidance and initiatives to be taken by ESPO and EcoPorts. Figure 4 presents the updated top 10 environmental priorities of European port authorities for 2016.



Figure 4: Top 10 environmental priorities of European ports for 2016

*Air quality* remains the number one priority of European ports, as in 2013. This is fully in line with the priority given to the subject at EU political level. The implementation of the Sulphur Directive and the ongoing political process on the air quality package have a clear role to play here. Overall, all the priorities of the 2013 top 10 remain in the top 10 of 2016. There are though some variations in the ordering of the priority items. The *relationship with the local community*,

port development and water quality are gaining importance. On the other hand, the handling of port waste, and dredging move down the top 10 scale.

Energy consumption becomes the second priority issue of European ports. Since 2009, the importance of energy consumption has raised year over year. One of the reasons is, of course, the direct link between energy consumption, and the carbon footprint of the ports and Climate Change. Noise appears in number three and has remained a top priority issue since 2004. Relationship with the local community climbs at number four and confirms again the acknowledgement of ports on this important topic. It is clear that ports grant their license to operate and to grow from their local communities.

The two waste items, port waste and ship waste, remain in the top 10 on the 5th and 6th position respectively. This shows once more the significance of waste management in ports and the ongoing discussion on the reception of ship generated waste as part of the revision of the port reception facilities directive. The climbing of water quality at number 8 can be linked with the implementation of the water framework directive and the ongoing discussions on the potential impact of washwater discharges by open loop scrubbers. Finally, it is interesting to note that port development (land), dredging operations, and dust are issues that have appeared consistently in the priority list of the European port sector over the last 20 years.

The 2016 exercise comes to complement the results of the previous surveys that initiated back in 1996. It is interesting to observe the evolution of the ports' environmental priorities over time in the following table 5. The issues that appear consistently year over year are mapped with the same colour in order to easily identify their evolution.

Table 5: Evolution of top environmental priorities over time (1996-2016)

	1996	2004	2009	2013	2016
1	Port Development (water)	Garbage / Port waste	Noise	Air quality	Air quality
2	Water quality	Dredging: operations	Air quality	Garbage/ Port waste	Energy Consumption
3	Dredging disposal	Dredging disposal	Garbage / Port waste	Energy Consumption	Noise
4	Dredging: operations	Dust	Dredging: operations	Noise	Relationship with local community
5	Dust	Noise	Dredging: disposal	Ship waste	Garbage/ Port waste
6	Port Development (land)	Air quality	Relationship with local community	Relationship with local community	Ship waste
7	Contaminated land	Hazardous cargo	Energy consumption	Dredging: operations	Port development (land related)

8	Habitat loss / degradation	Bunkering	Dust	Dust	Water quality
9	Traffic volume	Port Development (land)	Port Development (water)	Port development (land)	Dust
10	Industrial effluent	Ship discharge (bilge)	Port Development (land)	Water quality	Dredging: operations

## Green services to shipping

There are three key services/options that ports can consider implementing in order to enable and encourage better environmental performance by the vessels visiting the port. The provision of Onshore Power Supply (OPS), the provision of Liquefied Natural Gas (LNG) bunkering facilities and the differentiation of port charges in order to reward greener vessels visiting the port, can all have a positive environmental impact in the performance of vessels and the local air quality in European ports at large. ESPO, EcoPorts and PORTOPIA consider timely and topical to monitor the current status and evolution regarding the application of these key services in European ports. Hence, the EcoPorts SDM checklist was updated in spring 2015 in order to allow for data collection in these three key areas.

The review of 2016 then is setting for the first time the baseline regarding the uptake of these services in European ports. Due to this recent SDM update, it is important to mention that the results presented in this section are based on the contribution of 61 ports (instead of the 91 ports that contributed to the rest of the indicators presented in this report). The baseline figures that are presented below should be interpreted with caution. They set the basis for the further monitoring of trends in the following years.

Table 6: 2016 results on green services to vessels

<b>Green Services to shipping</b>	<b>2016 (%)</b>
<i>OPS available at one or more of the berths</i>	53
• <i>High voltage OPS available</i>	20
• <i>Low Voltage OPS available</i>	47
<i>LNG bunkering available in port today</i>	22
<i>Application of environmentally differentiated port charges for vessels</i>	62

The results confirm that offering differentiated port charges to reward greener vessels is an already well established practice in the majority of the respondent ports (62%). This is a voluntary practise by port authorities that choose to go further than controlling their own environmental impact and encourage a positive change of behaviour on the vessels performance side. Environmentally differentiated port charges are encouraged and promoted through the ESPO “Green Guide; towards excellence in port environmental management and sustainability”<sup>4</sup>.

<sup>4</sup> <http://www.espo.be/publications/espo-green-guide-towards-excellence-in-port-enviro>

The results regarding the provision of Onshore Power Supply (OPS) require a careful interpretation. The overarching question “do you provide OPS?” encompasses both the provision of high and low voltage installations. In reality, in the big majority of cases, high voltage OPS is required in order to be used by commercial seagoing vessels. There are however few exceptions (e.g. ports of Stockholm and Helsinki) where low voltage OPS is also used by commercial ROPAX vessels. Despite therefore the surprising 53% of respondent ports that provide OPS in their port (either high or low voltage), the appropriate figure to be used in order to set the 2016 baseline for the provision of OPS for commercial seagoing vessels is the one that describes the provision of high voltage OPS. One out of five of the 61 respondent ports (20%) have such high voltage OPS installations in place. The low voltage OPS figures mainly relate to inland and domestic vessels as well as auxiliary vessels (e.g. tugs and/or other port authority vessels). It is clear that low voltage OPS has also important benefits for the local air quality.

Regarding LNG, the results show that more than one out of five respondent ports (22%) can already provide LNG bunkering either regularly or upon request. It is interesting to follow the evolution of this baseline figure in the years to come also in relation to fulfilling the requirements of the directive on alternative fuels infrastructure that would oblige a number of ports to provide LNG bunkering by 2025.

Given the analysis above the baseline 2016 figures regarding OPS, LNG bunkering and environmentally differentiated charges are summarised in the following figure 5.

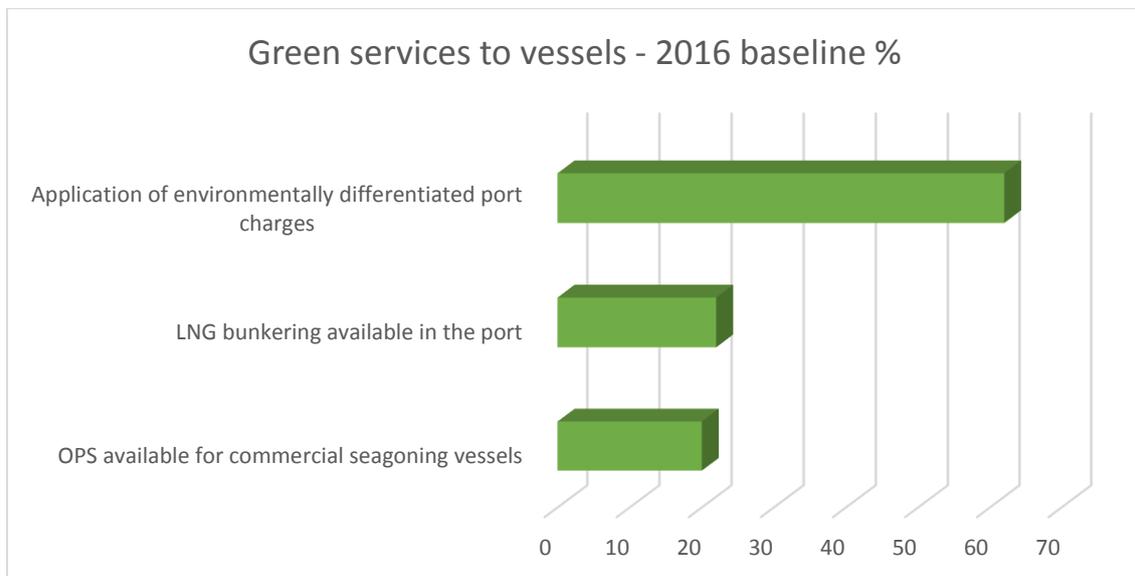


Figure 5: Baseline 2016 figures (%) on OPS, LNG bunkering and environmentally differentiated port charges

## Acknowledgements

ESPO and EcoPorts are grateful to all the 91 ports from 20 EU Member States that contributed to the Environmental Review 2016. The review and the analysis of the outcomes took place in full coordination and cooperation between ESPO, EcoPorts and the PORTOPIA project. This report was compiled by Antonis Michail, Senior Policy Advisor at ESPO and EcoPorts Co-ordinator, with the assistance of Rosa Maria Darbra and Marti Puig from the Polytechnical University of Catalunya who are also leading the environmental workpackage in the PORTOPIA project.