

Sustainability Report 2017

Introduction

This report presents the updated results for the year 2017 of the European ports' environmental performance. Selected benchmark performance elements are introduced and discussed. The data on these indicators are obtained from the responses of 91 EU ports to the EcoPorts SDM, a tool developed for identifying environmental risk and establishing priorities for action and compliance (<http://www.ecoport.com/>).

Initially, the section introduces the sample of the respondent ports, mentioning the number of ports by country that contributed to the exercise, their geographical location and their size. Secondly, the results of the indicators are provided, being structured in the four categories of the PORTOPIA environmental indicators: i) environmental management indicators, ii) environmental monitoring indicators, iii) top environmental priorities and iv) services to shipping. The 2017 results are then compared with those from 2016, 2013, and variations and trends over time are highlighted. Finally, some conclusions are drawn.

The sample of respondent ports

As mentioned, 91 ports participated in this assessment from 21 different countries. Table 1 below provides the list of EU countries represented, the number of participating ports of each country and the percentage. Spain and the United Kingdom are the countries that have more ports represented, 12% each one, followed by France with 11% of ports.

Table 1: List of countries represented in the sample and the number of participating ports

Country	Number of ports	Percentage
Spain	11	12%
United Kingdom	11	12%
France	10	11%
Netherlands	9	10%
Germany	7	8%
Greece	7	8%
Sweden	4	4%
Norway	4	4%
Denmark	4	4%
Italy	3	3%
Croatia	3	3%
Ireland	3	3%
Finland	3	3%
Latvia	2	2%
Jordan	2	2%
Portugal	2	2%
Turkey	2	2%
Romania	1	1%
Estonia	1	1%
Morocco	1	1%
Lithuania	1	1%

Figure 1 shows the geographic settings of the contributing ports. It demonstrates that the sample is reasonably well balanced concerning the location of the ports.

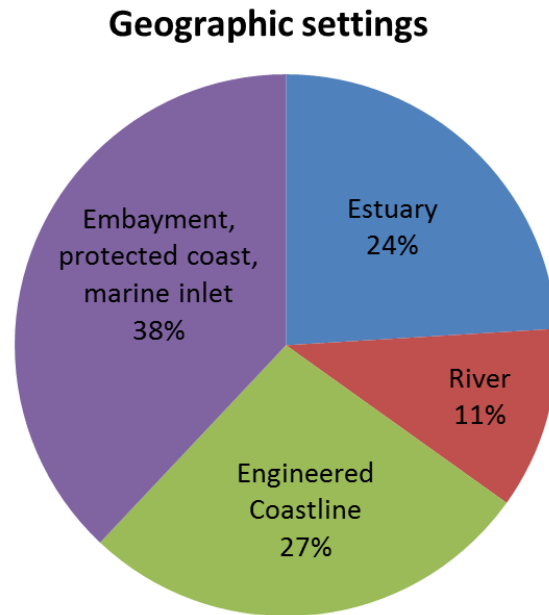


Figure 1: Geographical characteristics of the sample

Another characteristic of the sample that is studied is the tonnage of the contributing ports, in terms of millions tons handled per year. Figure 2 demonstrates that most of the ports are small (<5 million tons) and medium (5<15 million tons) sized.

Tonnage (million tons/year)

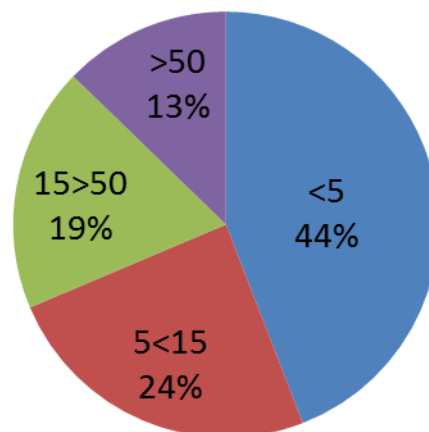


Figure 2: Tonnage characteristics of the sample

Below, the results of the different indicators are presented according the aforementioned categories. The performance of 2017 is compared, whenever it is possible, with the performance obtained in the Sustainability Report 2016 (Puig *et al*, 2017) and with the ESPO review carried out in 2013 (Puig *et al*, 2015).

A. Environmental management indicators

This section provides the results of the environmental management indicators. These are 10 indicators that provide information about the management efforts that influence the environmental performance of the port. Table 2 below shows the percentage of positive responses to each of these 10 PORTOPIA indicators in the review of 2013, 2016 and 2017, so the variations over time are demonstrated.

Table 2: Percentages of positive responses to the environmental management indicators

	Indicators	2013 (%)	2016 (%)	2017 (%)	% change 2013-2017
A	Existence of an Environmental Management System (EMS)	54	70	70	+16%
B	Existence of an Environmental Policy	90	92	97	+7%
C	Environmental Policy makes reference to ESPO's guideline documents	38	34	35	-3%
D	Existence of an inventory of relevant environmental legislation	90	90	93	+3%
E	Existence of an inventory of Significant Environmental Aspects (SEA)	84	89	93	+9%
F	Definition of objectives and targets for environmental improvement	84	89	93	+9%
G	Existence of an environmental training program for port employees	66	55	68	+2%
H	Existence of an environmental monitoring program	79	82	89	+10%
I	Environmental responsibilities of key personnel are documented	71	85	86	+15%
J	Publication of a publicly available environmental report	62	66	68	+6%

The results demonstrate that the existence of an Environmental Policy is the indicator that has a higher percentage of positive response. Practically all the participant ports have defined an Environmental Policy. This percentage of positive response has increased +7% since 2013. The second highest percentages are the existence of an inventory of relevant environmental legislation, inventory of SEAs, and definition of objectives and targets, with 93% of positive response. The last two indicators increased 9% compared to the results published in 2013. The ranking is followed by the indicator of the existence of an environmental monitoring program. It is also interesting to point out that the indicator on the existence of an EMS has increased from 54% in 2013 to a 70% in 2017. As it can be seen, almost all the indicators have improved with respect to 2016.

On the basis of these ten indicators, PORTOPIA has developed the so called Environmental Management Index. This is calculated on the basis of a specific weighting applied to the significance of these key environmental management components. It is argued that this index is particularly appropriate since it is a measure of competence and capability to deliver the environmental imperatives. The Environmental Management Index is calculated by multiplying the weightings associated to each environmental management indicator (see table 2 and formula below) to the percentage of positive responses. In other words, the final score is calculated by applying the following formula:

$$\text{Environmental Management Index} = A*1.5 + B*1.25 + C*0.75 + D*1 + E*1 + F*1 + G*0.75 + H*1 + I*1 + J*0.75.$$

Where the value of each letter is the percentage of positive response divided by 100 (e.g. A is 0.7 in the results of 2017 as showed in table 2). The resulting index for the performance of the port sector in 2013, 2016 and in 2017 is provided in Table 3.

Table 3: Environmental Management Index in 2013 and 2016.

	2013	2016	2017
Environmental Management Index	7.25	7.72	8.08

The index value has increased year-on- year, following the trends of the environmental management indicators (see Table 2).

Another significant point to highlight within this Sustainability Report is the number of ports that are EMS certified to an internationally recognised standard. A total number of 64 ports out of the 91 are EMS certified, 47 of them under ISO 14001, 6 under EMAS, and 26 ports have achieved the PERS certificate. The total number of certifications is in fact more than 64 because some ports are certified under more than one system. Figure 3 presents the results of the EMS certificates broken down into categories.

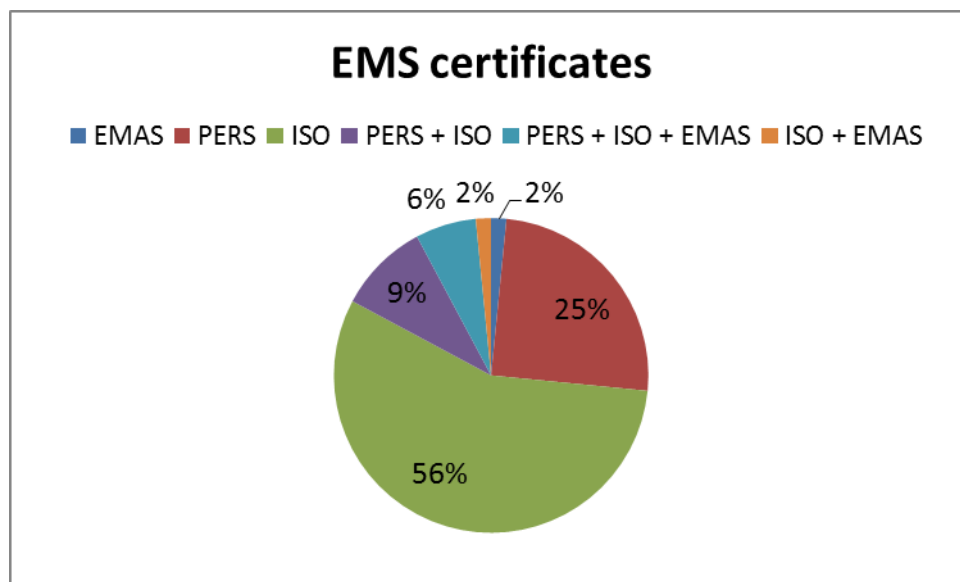


Figure 3: Distribution of the EMS certificates

The figure shows that more than a half of the certified ports (56%) are only ISO 14001 certified. It is followed by a quarter of ports (25%) that are only PERS certified. It continues then with the ports that are double certified with PERS and ISO 14001 (9%) and with the three EMS certificates (6%). There is a minority of ports that are either only EMAS, or ISO 14001 and EMAS (2% each case). The positive, significant trend for the sector is that increasingly more port authorities are openly demonstrating their environmental credentials and transparency of action through independent, third-party review and audit.

B. Environmental monitoring indicators

The second category of indicators are focussed on the environmental monitoring programs of European ports. These indicators provide the percentage of ports that monitor selected environmental issues. The percentages of positive responses are given in Table 4, listed in descending order based on the results obtained in 2017. The results obtained in 2013 and 2016 are also provided in the table below:

Table 4: Percentage of positive responses to environmental monitoring indicators

Indicators	2013 (%)	2016 (%)	2017 (%)	% change 2013-2017
Waste	67	79	88	+21
Energy consumption	65	73	80	+15
Water quality	56	70	75	+19
Water consumption	58	62	71	+13
Air quality	52	65	69	+17
Sediment quality	56	63	65	+9
Noise	52	57	64	+12
Carbon Footprint	48	47	49	+1
Soil quality	42	44	48	+6
Marine ecosystems	35	36	44	+9
Terrestrial habitats	38	30	37	-1

In 2017, waste has been pointed out as the most monitored issue, as in 2013 and 2016. There has been an increase of 21% of ports monitoring this aspect in the last 4 years. It is followed by energy consumption (that increased +15% since 2013), water quality (rising +19%) and air quality (+17% since 2013).

Marine ecosystems and terrestrial habitats are the issues that have a lowest percentage of ports monitoring them. As it can be seen, all the indicators have more positive responses in 2017 than in 2016.

C. Top 10 Environmental priorities

The third section provides the update of the Top 10 environmental priorities of the European port authorities. It is an interesting exercise that has to be brought up to date regularly because it shows the current issues that are at stake for the port sector and their evolution. 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. The 2017 exercise comes to complement the results of the previous ESPO/EcoPorts surveys that initiated back in 1996. The issues that appear consistently year over year are mapped with the same colour in order to easily identify them.

Table 5: Top 10 environmental priorities of the port sector over years.

	1996	2004	2009	2013	2016	2017
1	Port Development (water)	Garbage / Port waste	Noise	Air quality	Air quality	Air Quality
2	Water quality	Dredging: operations	Air quality	Garbage/ Port waste	Energy Consumption	Energy Consumption
3	Dredging disposal	Dredging disposal	Garbage / Port waste	Energy Consumption	Noise	Noise
4	Dredging: operations	Dust	Dredging: operations	Noise	Relationship with local community	Water quality
5	Dust	Noise	Dredging: disposal	Ship waste	Garbage/ Port waste	Dredging: operations
6	Port Development (land)	Air quality	Relationship with local community	Relationship with local community	Ship waste	Garbage/ Port waste
7	Contaminated land	Hazardous cargo	Energy consumption	Dredging: operations	Port development (land related)	Port development (land related)
8	Habitat loss / degradation	Bunkering	Dust	Dust	Water quality	Relationship with local community
9	Traffic volume	Port Development (land)	Port Development (water)	Port development (land)	Dust	Ship waste
10	Industrial effluent	Ship discharge (bilge)	Port Development (land)	Water quality	Dredging: operations	Climate change

Most of the priorities of the 2016 top-10 remain in the top-10 of 2017. There are some changes in the order of priorities and a new entrance for the first time to the top-10, Climate Change (which as a category under EcoPorts covers energy efficiency, GHG emissions reduction and adaptation). There are now three emissions related issues reported in the top-10 priorities, i.e. Air Quality, Energy Consumption and Climate Change. This shift reflects efforts made by ports to address the challenges of climate change, the energy transition policies already being implemented to fulfil the objectives of the Paris Agreement, and increased awareness about the exposure of ports to extreme weather events. In the case of *Dredging operations* and *Water quality*, importance rose in priority whilst *Garbage / Port waste*, *Ship waste* and *Relationship with local community* moved down the priority scale. However, it is important to point out that waste was reported to be the issue most monitored by ports in 2017 (table 4).

Air quality remains the number one priority of the European ports, as in 2016 and 2013. This is fully in line with the maintenance of air quality as a top priority also of the EU

policy agenda and the various ongoing regulatory measures that include the introduction of the global 0.5% sulphur cap on marine fuels in 2020, the introduction of the IMO NOx Tier III requirements for vessels built from 1-1-2021 onwards operating in the North and the Baltic sea (NECAs), the implementation of the Sulphur Directive and the new National Emission Ceilings Directive. *Energy consumption* also remains as the second priority issue of the European ports. Since 2009, the importance of energy consumption raised year over year as it can be seen in table 5. One of the reasons for this increase is, of course, the direct link between energy consumption, and the carbon footprint of the ports and Climate Change. *Noise* remains as the third concern by priority and its importance has also grown smoothly since 2004.

Another interesting fact is that there are two issues that have appeared consistently in the priority list of the port sector over the last 20 years, although they are not in the top positions of the table. These issues are *port development (land)* and *dredging operations*.

D. Services to shipping

The last section provides the results on the category ‘services to shipping’. It comprises three indicators on the efforts made by the port authorities in order to facilitate a greener shipping. PORTOPIA considers that it is timely and topical to monitor the current status and evolution of some key services that ports may choose to provide such as the provision of Onshore Power Supply, the provision of Liquefied Natural Gas (LNG) bunkering facilities and the differentiation of port charges in order to reward greener vessels visiting the ports. Hence, and as a result of coordinated effort by PORTOPIA and EcoPorts, the EcoPorts SDM checklist was updated back in spring 2015 in order to allow for data collection in these key three areas. The figures below update the performance of the sector on this issue. It should be noted that in 2016 only 61 ports reported on these topics whereas in 2017, the participating ports increased to 91. Therefore, the results may reflect a slight decrease due to the wider sample of the respondent ports taken into account and not due to a real decrease in services offered by ports. In fact, in absolute figures, the ports offering for example Onshore Power Supply (OPS) have increased from 32 (2016) to 44 ports (2017). The same happens for the rest of the questions.

Table 6: Percentage of positive responses to services to shipping indicators

Indicator	2016*(%)	2017 (%)
Is On-shore Power Supply (OPS) available at one or more of the berths?	53	48
If YES, high voltage?	20	19
If YES, low voltage?	47	40
Does the port offer differentiate dues for “Greener” vessels?	62	51
Is Liquefied Natural Gas (LNG) bunkering available in the port today?	22	22

*This percentage is calculated only with 61 ports whereas the 2017 is done with 91 ports.

The results regarding the provision of 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 48% 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 2017 baseline for the provision of OPS for commercial vessels is the one that describes the provision of high voltage OPS. Almost one out of five of the 91 respondent ports have high voltage OPS installations. The low voltage figures mainly relate to inland and domestic vessels as well as auxiliary vessels (e.g. tugs and/or other port authority vessels).

Table 6 also confirms that offering differentiated port charges to reward greener vessels is an already established practice in half of the respondent ports (51%). This is a voluntary practice 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”.

The outcomes regarding LNG show that one out of five respondent ports can already provide LNG bunkering 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 as regards the provision by ports of LNG bunkering facilities by 2025.

Conclusions

This report demonstrates that, based on a survey of the EcoPorts Network, the majority of EU ports are working actively to protect the environment with the aim of achieving sustainable development of European ports and harbours.

The results demonstrate that in general there has been an increase in the effective performance of the sector regarding the existence of environmental management components, and in terms of monitoring environmental issues. The evidence for these positive results is the rise in the number of ports having an Environmental Policy, the increase of the Management Index and the investments in conducting more monitoring in aspects such as waste or energy consumption.

This update of the top-10 environmental issues is an important review for the port sector in Europe because it identifies the high priority issues common to the sector on which ports are working, and sets the framework for guidance and initiatives to be taken by ESPO. Air quality remains at the top of the priorities together with Energy consumption, Noise and Water quality, while a third emissions related priority, Climate Change, enters the top-10 for the first time.

Finally, the benchmark performance of the port services to shipping indicators has been updated with the results of the 91 responses in 2017. Although it seems that there has not been a rise in the percentage performance of these indicators in absolute values there has been an increase for all of them. In any case there is room for further improvement and focus may be given on those issues in the upcoming years.

The extent to which port authorities are actively influencing shipping to become ‘green’ is indicated by the increasing number of ports offering a range of options including fee

reduction (against a range of criteria) and specific possibilities such as OPS. Indicators of the implementation of these options have only recently been introduced into the response database and it is widely acknowledged that the issue of port provisions for 'Green Shipping' will become increasingly significant in the near future.

References

Puig, M., Wooldridge, C., Michail, A., Darbra, R.M. 2015. Current status and trends of the environmental performance in European ports. *European Science and Policy*, 48, pp. 57-66.

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